UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 4/Pg.5

Union's 2012 capital spending plan includes $7.4 million related to costs to provide distribution services to the town of Red Lake. Please answer the following questions related to this project:

a) Will this project be completed and be used and useful in 2012?

b) What is the total cost of this project and what is the level of contribution in aid of construction? Please provide a breakdown of the contribution in aid of construction.

c) To-date what has been the amount of the contribution in aid of construction that Union has received?

---

**Response:**

a) Yes, the Red Lake Project is expected to be in-service by December 2012.

b) The estimated total cost to provide natural gas distribution service to residents and businesses in the Municipality of Red Lake (Phase II) is $19.3 million (which includes $6.8 million to fund the increased pipeline capacity required as part of Phase I). The Municipality of Red Lake is continuing work to secure the $10.5 million in funding required to complete this project and final scope of Phase II will be determined based on the funding available.

c) Funding from the contributing partners will commence when construction begins.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit B1, Tab 2, page 4

Union's evidence indicates that the major transmission projects for 2013 include the Parkway West project at a cost of $80.0 million and the Owen Sound Replacement project at a cost of $17.9 million. Please answer the following questions with respect to these projects:

a) Please provide additional information about the projects including need and benefits to ratepayers.

b) When was the need for these projects identified?

c) Please provide reasons for undertaking these projects in the Test Year and the impact of delaying the projected in-service date?

d) Please confirm if these projects will be used and useful in the Test Year.

---

**Response:**

**Owen Sound Line Replacement**

a) The Owen Sound Line was constructed in 1958 and is inspected periodically as part of Union Gas' Integrity Management Program. Results of scheduled inspections in 2011 have identified multiple integrity issues that could pose safety and security of supply concerns if not addressed.

The $17.9 million forecast for this project involves the removal and replacement of approximately 21 km of NPS 12 pipe to mitigate the identified integrity issues. The replacement pipe is located between the Owen Sound Valve Site and the Waterloo Gate Station. The replacement is size for size and provides a long-term solution for safety and security of supply.

b) The integrity concerns on the Owen Sound Line were identified in 2003 and have been addressed piecemeal since that time. The 2011 in-line inspection identified integrity issues spanning a 21 km length of the pipeline to the extent that replacement of individual sections is no longer a feasible solution.

c) The integrity concerns were identified as part of the Integrity Management Program in 2003 and reconfirmed as part of a scheduled inspection in 2011. Short-term mitigation of high risk anomalies were completed immediately, including two repairs and two short replacement sections. The long-term solution is a replacement of the section of the Owen Sound Line from the Owen Sound Valve Site to the Waterloo Gate Station. Based on the estimated planning and construction schedule, the Owen Sound Line Replacement is scheduled for completion in 2013. If the Owen Sound Line Replacement is delayed, the integrity concerns will become more serious as risk of failure increases.

d) The Owen Sound Line Replacement is scheduled for construction and in-service in 2013.

**Parkway West Project**

a) Description of the Existing Parkway Facilities

The existing Parkway Compressor Station is currently served by a single valve site and header system off of the Dawn-Parkway system. The Dawn-Parkway system at this location consists of three parallel pipelines – 26", 34" and 48". The nearest mainline valve site is the Milton Valve Site located 8.8 km west of Parkway.

Within the existing Parkway Compressor Station, Union connects to the Enbridge system on the suction side of the compressor (i.e. before compression). Union owns and operates custody transfer measurement at this interconnection, which is known as Parkway (Consumers). Also, within the existing Parkway Compressor Station, Union connects to the TCPL system on the discharge side of the station (i.e. after gas is compressed). Union owns and operates check measurement at this interconnection, which is known as Parkway (TCPL).

The Lisgar Station is located approximately 2 km east of the Parkway Compressor Station just north of the intersection of Winston Churchill Boulevard and Aquitane Avenue in Mississauga and is a direct connection between Union and Enbridge. Gas is delivered to Enbridge at the Lisgar Station through 26" and 34" pipelines that extend past the Parkway Compressor Station. Union owns and operates custody transfer measurement at this interconnection, which is known as Lisgar. The Trafalgar Compressor Station, located between the Parkway Compressor Station and Lisgar, was retired in March 2012.

A schematic of the existing Parkway Compressor Station, including Lisgar, is provided as Attachment 1.

Deliveries to Enbridge at Parkway and Lisgar

A significant amount of gas supply intended for delivery into the GTA and other parts of Ontario is either delivered at or passes through Parkway. Based on Enbridge design day

system demand of approximately 3.7 PJ/d, Union delivers to Enbridge approximately 57% of that supply at Parkway or through the Parkway compression.

Deliveries at Parkway (Consumers) and Lisgar are made to Enbridge directly in the market area. Enbridge contracts for deliveries of approximately 1.6 PJ/d with flexibility to designate the delivery of that gas between the Parkway (Consumers) and Lisgar interconnections. The Parkway (Consumers) interconnection has a maximum capability of approximately 1.4 PJ/d and the Lisgar interconnection has a maximum capability of 0.8 PJ/d (see response at Exhibit J.B-1-7-1). From the Parkway (Consumers) and Lisgar interconnections, Enbridge moves the gas through its in-franchise pipeline system to consuming markets located in the west and central portions of the GTA (from Lake Ontario to the northern limits of the GTA). The Enbridge system serves a large proportion of residential and commercial customers with heat sensitive demand (approximately 80% of consumption profile). In their 2013 Rate Case filing at Exhibit B, Tab 3, Schedule 1 (page 9 of 10), Enbridge states that they expect to continue to add approximately 40,000 customers per year, largely in the GTA. Continued population growth in the GTA will likely result in higher peak demands in the future on the Enbridge system.

Loss of Service – Enbridge Connections

A loss of delivery at Parkway (Consumers) and/or Lisgar would have significant and immediate impact on the Enbridge system. Exhibits J.B-1-7-13 and J.B-1-13-4 discuss potential outage scenarios for the feeds to Enbridge. An outage at Parkway (Consumers) would result in a delivery loss of 0.8-1.4 PJ/d into the Enbridge system during peak demand. An outage at Lisgar would result in a delivery loss of 0.2-0.8 PJ/d into the Enbridge system during peak demand. An outage of both the Parkway (Consumers) and Lisgar feeds into the Enbridge system would result in an immediate delivery loss of 1.6 PJ/d. Parkway is unique in that it is located directly in the market area. In the event of an outage, supply replacement will be immediately required with primary alternative supply through Enbridge's connections with TCPL. If service cannot be restored quickly or alternative supply cannot meet peak demands (after any load shedding opportunities), low system pressure or system outages would affect safety and health within parts of the Enbridge franchise.

Restoration of service for natural gas system outages is very time consuming requiring at least two visits to each customer; one to safely shut in the service and the other to safely restore the service ("light up"). Depending upon the extent of a system outage, restoration could be measured in days/weeks/months. Until service can be safely restored, the area affected by the outage would be without natural gas service, leading to health, safety and property damage issues.

An outage at Parkway (Consumers) and Lisgar during peak demand would impact regional gas flows to points east of Parkway in eastern Ontario, Quebec and the U.S. Northeast as the GTA consumes available supply. Natural gas-fired power generation facilities in the GTA would likely be impacted by low system pressures or system outages.

As part of the Parkway West Project, Union proposes a second, secure feed for gas supply to Enbridge that replicates the current connections at Parkway (approximately 1.6 PJ/d). This new Enbridge connection is proposed to be physically separated from the existing Parkway Compressor Station. The proposed second feed to Enbridge will increase the security and reliability of Dawn-Parkway supply for Enbridge GTA customers.

Deliveries to TCPL at Parkway

Union has the ability to move up to 2.54 PJ/d of gas through the existing Parkway compressors (Parkway A and Parkway B) into the TCPL system on a design day. Individually, Parkway A and Parkway B have delivery capability of 1.2 PJ/d and 1.8 PJ/d, respectively, based on the Winter 2011/2012 design day. Deliveries to TCPL are made on the discharge side of the existing Parkway compressors and then gas is transported through the TCPL system i) east of Parkway to Ontario, Quebec and U.S. Northeast markets with some gas being delivered by TCPL into the Enbridge system within the GTA and ii) south to the western portion of the GTA in Union's franchise as well as potentially further to the Niagara region. Currently contracts at Parkway (TCPL) are approximately 2.0 PJ/d, including 0.4 PJ/d delivered to Union's Northern and Eastern franchise areas as well as Union's franchise area in Oakville and Burlington. Union believes 2.0 PJ/d is about the maximum capacity of the measurement and the downstream piping owned and operated by TCPL. In the immediate future, deliveries into the TCPL system at Parkway are expected to increase by approximately 0.4 PJ/d (2012/2013) once proposed TCPL expansion facilities have been approved by the National Energy Board and placed into service. Union estimates that flows through compression located at Parkway could increase to 3.0 PJ/d in the 2015/2016 timeframe (see response at Exhibit J.B-1-7-2).

Loss of Service – TCPL Connections

Union has seen and expects to continue to see changing flow patterns at Parkway through the connection with TCPL. Flows through Parkway compression have significantly increased from less than 0.5 PJ/d in 2005 to approximately 2.0 PJ/d today resulting in an increase in operating hours for the Parkway compressors and an increase in number of days when both Parkway compressor units are operating. Flows through compression at Parkway are estimated to increase an additional 1.0 PJ/d by 2015/2016. Union believes that flows of this quantity into key eastern markets, including the GTA and other regions of Ontario, support the need for increased security and reliability.

In addition, flow through Parkway was typically bi-directional with gas flowing into Union from TCPL during summer months and gas flowing from Union to TCPL during winter months. Today, and as expected in the future, gas can be characterized as flowing primarily from Union into the TCPL system on a year-round basis.

Currently the volumes delivered to TCPL through Parkway compression are not fully covered by Loss of Critical Unit protection. As provided in Exhibit J.B-1-7-5, the addition of Parkway B in 2007 created some compression horsepower in excess of current demands and this excess horsepower has provided some Loss of Critical Unit protection in the event of a loss of Parkway A. However, the level of Loss of Critical Unit protection afforded by the excess Parkway B horsepower will decrease as flow increases through Parkway. Today, loss of Parkway B would result in a throughput shortfall of approximately 0.6 PJ/d (also see response at Exhibit J.B-1-7-12). As volumes grow and throughput through Parkway compression reaches 3 PJ/d there would be no Loss of Critical Unit protection. At a total throughput of 3.0 PJ/d, loss of Parkway B results in a shortfall of approximately 1.6 PJ/d and loss of Parkway A results in a shortfall of approximately 1.0 PJ/d.

Union believes that an outage of one of the Parkway compressors in the future will be significant for gas flow during peak demand to Ontario markets, such as the GTA and northern and eastern Ontario. Although Enbridge contracts for only a portion of the volumes discharged into the TCPL system, other customers within the GTA and northern and eastern Ontario, such as natural gas-fired power generators and direct purchase customers, may be served through Parkway exports. It is expected that the GTA, given its location adjacent to Parkway, could be significantly impacted, which could include low system pressure and system outages. The same may occur in other Ontario markets served by TCPL. Failure to deliver during peak conditions at Parkway would cause the market to lose confidence in the reliability of the Union delivery system and could lead to shippers choosing to decontract the Dawn-Parkway path in an effort to seek diverse, secure and reliable supply.

Union believes that Loss of Critical Unit protection at Parkway is appropriate and that the proposed facilities are the best reliability option. Alternatives considered are addressed at Exhibit J.B-1-1-7.

Parkway West Facilities and Costs

As described below, recently Union has made some changes to the timelines and has updated estimated capital costs for the proposed Parkway West Project.

i) Parkway West Land Purchase
Union recently extended its option to purchase the Parkway West land. Although there is a potential for the transaction to be completed in 2012, Union expects the option to be exercised in 2013. The purchase price of the land will be approximately $20 million.

The existing Parkway Compressor Station is located on the western edge of Mississauga. The property is situated between the 9th Line and Highway 407 with developers owning the adjacent properties to the south and north of the existing Parkway property. The existing Parkway Compressor Station does not provide enough land to install an additional compressor to provide Loss of Critical Unit protection while maintaining Union Gas design standards and does not provide enough land for future expansion. A second connection at the

existing Parkway Compressor Station will not provide the security and reliability needed for the Parkway (Consumers) and Lisgar feeds.

Residential housing development exists east of the existing Parkway Compressor Station and there are plans for future development north and south of the existing Parkway property. Much of the land west of Highway 407 in the vicinity of Parkway has been purchased by developers. The property proposed for the Parkway West Project is located west of Highway 407, north of Derry Road, in Milton. This property is relatively close to the existing Parkway Compressor Station, provides enough land for the facilities for the proposed Parkway West Project, and allows for future expansion, including additional compressor units and a connection for the proposed Enbridge GTA Project.

ii) Parkway West Metering and Headers
The Parkway West Metering and Headers are now proposed to be completed for November 1, 2014 and are proposed to be constructed concurrently with the proposed compression. The estimated cost of the measurement, control and piping facilities for the second Enbridge feed is approximately $35 million and the estimated cost of the measurement, control and piping facilities for the connection to TCPL is approximately $19 million.

Common facilities required to support the Loss of Critical Unit protection and the second connection to Enbridge include the valving and piping at the connection to the Dawn-Parkway system and the pipeline headers to connect the Dawn-Parkway system with Parkway West. Including lands, the cost of the common facilities is estimated to be approximately $55 million.

iii) Loss of Critical Unit Protection
The compression facilities for Loss of Critical Unit protection are expected to be approximately the same size as the largest compressor unit at the existing Parkway Compressor Station, Parkway B. These facilities are proposed to be completed for November 1, 2014 at an estimated cost of $108 million.

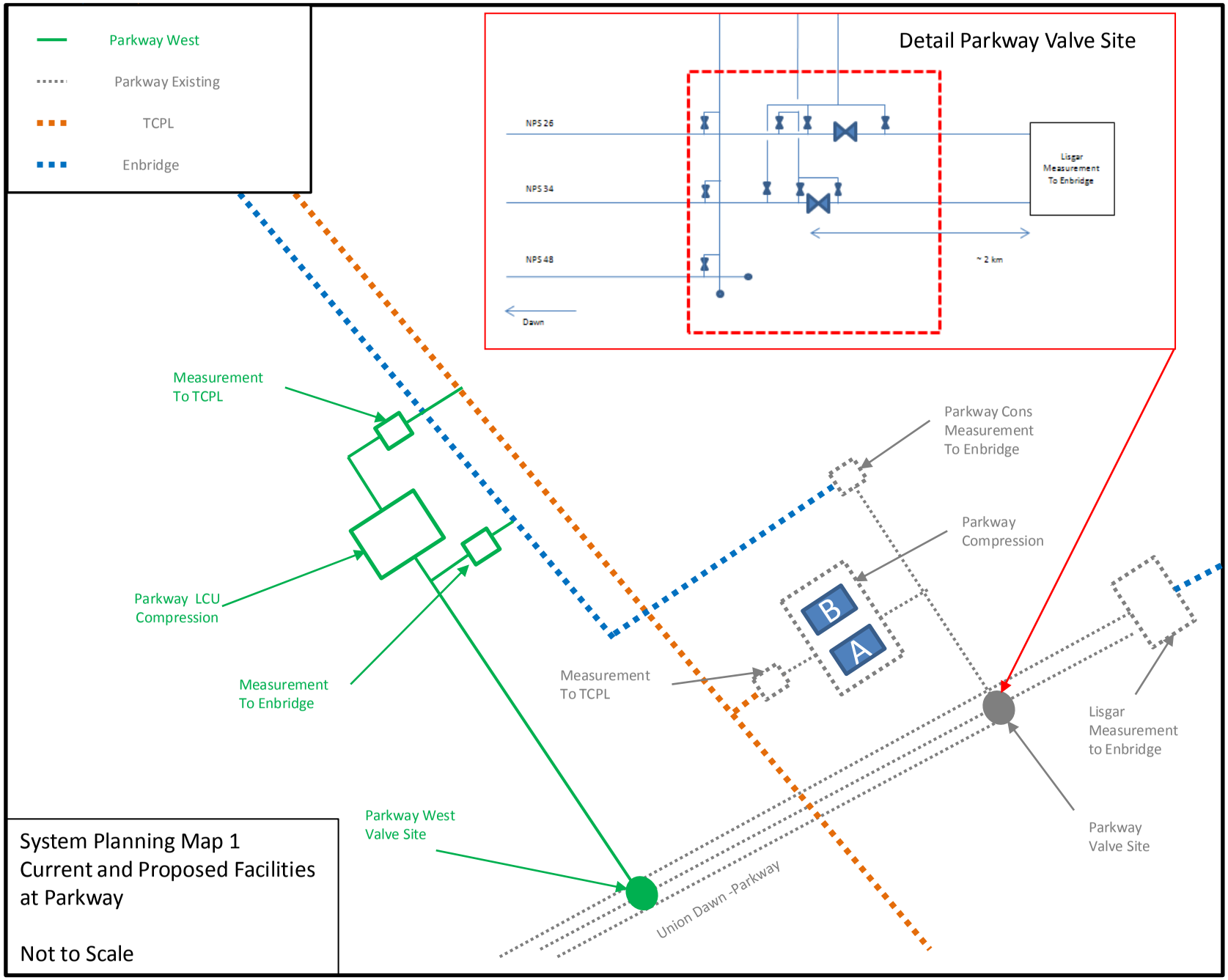
In total, the Parkway West Project will be placed into service in 2014 at an estimated cost of $217 million. None of the facilities will be completed and placed into service during the Test Year (2013).

b) In 2008 Union identified that the Trafalgar compressor (6,000 HP) needed major upgrades to meet emission standards before the end of 2012. The Trafalgar compressor provided some flexibility to deliver at Parkway including partial horsepower backup for volumes flowing through the Parkway compressor (although not to the full contractual pressure requirement for discharge into the TCPL system). Union subsequently decided to retire the Trafalgar compressor effective March 2012 and identified a potential need for increased reliability at Parkway.

In 2010, the need for Loss of Critical Unit protection was considered based on the changing flow patterns at Parkway - increased flow through the compressors, transformation to year-round exports (from Union into TCPL) and the potential for increased throughput as a result of changing North American supply dynamics, such as increased production from emerging unconventional supply basins such as the nearby Marcellus, the shift from Western Canadian supply and long haul transportation to Dawn supply and short haul transportation, and the growth of gas-fired power generation in the GTA. Union estimated that flow through the Parkway compression could grow in excess of 1.0 PJ/d by 2015/2016 which includes over 0.4 PJ/d of incremental throughput as a result of proposed TCPL facilities expansion.

c) Please see the response at a) above.

d) Please see the response at a) above.


Parkway West
Parkway Existing
TCPL
Enbridge
Detail Parkway Valve Site
NPS 26
NPS 34
NPS 48
Dawn
Lisgar Measurement To Enbridge
~ 2 km
Measurement To TCPL
Parkway Cons Measurement To Enbridge
Parkway Compression
Parkway LCU Compression
Measurement To Enbridge
Measurement To TCPL
B
A
Lisgar Measurement to Enbridge
Parkway Valve Site
Parkway West Valve Site
Union Dawn -Parkway
System Planning Map 1
Current and Proposed Facilities at Parkway
Not to Scale

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/ Tab 2/Pg.3

Please provide a list of all individual distribution capital projects in 2012 and 2013 that fail to achieve the minimum threshold profitability index ("PI") of 0.8. Please provide a rationale for going ahead with such projects. Please do not include projects that fail the minimum threshold PI but will receive a contribution in aid of construction.

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**Response:**

Union does not have any projects in the capital budget for 2012 or 2013 at PI's of less than 0.8.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/ Tab 3/App B

In Union's Updated Application filed on March 27, 2012, Union has revised the 2011 residential conversions from a total of 3,450 conversions to 4,972 conversions, an increase of 44% over the 2011 outlook filed in November 2011. Union has stated in evidence that the residential market is essentially saturated and regional market assessments indicate a declining level of future conversion activity. In light of the upward revision to the 2011 outlook, why has Union not considered updating its 2012 and 2013 forecast numbers? Please provide reasons as to why the 2012 and 2013 numbers would fall from 4,972 to 3,200 and 3,000 respectively.

---

**Response:**

Union elected not to update the conversion forecast because updated new housing forecast information suggests that reduced new housing levels would more than offset the increased conversions.

Union aggressively targeted potential conversion customers in the last half of 2011 to take advantage of reduced commodity prices. This campaign was a means to mitigate decline in the new housing market. Energy price advantages relative to competing fuels are driving increased interest in conversions.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/ Tab 3/App B

In Union's evidence, the forecast conversions for Northern/Eastern customers for 2012 are estimated to be 1,480. Similarly, new attachments are estimated to be 3,040. Please confirm whether these numbers include attachments/conversions in the community of Red Lake. In case the numbers include the attachments/ conversions related to the Town of Red Lake, please provide reasons for the low forecast number.

---

**Response:**

Union's conversion forecast does not include customers in Red Lake. The reason that forecast conversions in 2012 are fewer than in 2011 is because reduced commodity prices that are leading to heightened interest in conversions were not evident at the time the forecast was completed.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/ Tab 2

Considering the outlook for the supply and price of natural gas, does Union intend to revive the natural gas for vehicles program?

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**Response:**

Currently, Union has no plan to revive the natural gas for vehicles program. The Company is monitoring the development of NGV for long-haul trucks and fleet vehicles in North America.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 9

Union's evidence provides details on Union's Parkway West construction project scheduled for completion in 2014. Please answer the following questions with respect to this project:

a) Union has budgeted $80 million in 2013 for the Parkway West construction project. Please provide the major components of this project that are scheduled for 2013.

b) Union has budgeted an amount of $120 million in 2014 for Loss of Critical Unit Protection. Union proposes to install approximately 40,000 HP of compression that connects to suction and discharge headers and custody transfer metering. What alternatives did Union consider for this project? Please provide details.

c) What is the current compression HP that Union is using for deliveries into the TCPL system at Parkway?

d) What has triggered the need for Loss of Critical Unit Protection? Please provide a detailed response.

e) How will the Parkway West construction project be brought into in-service? Will the entire project be used and useful at a certain date or will this be used and useful in phases?

f) What portion of the project will be used and useful in 2013 and what is the estimated cost of the part of the project that will be used and useful in 2013?

---

**Response:**

a) Please see the response at Exhibit J.B-1-1-2 a). None of the major components of the Parkway West Project are proposed to be in-service for 2013.

b) Several options were investigated but ultimately discarded as not feasible. The primary alternatives considered are detailed below.

Parkway LCU (Existing Site)

The possibility of installing LCU compression at the existing Parkway Compressor Station was investigated. Union has a standard minimum separation requirement for compression facilities to minimize the impact of a catastrophic failure of one unit on another. The addition of new compression at Parkway would not allow Union to maintain this minimum. Union has investigated options to purchase sufficient additional land from adjacent land owners to increase the size of the Parkway site which would allow proper spacing for an additional compressor unit, but has been unsuccessful in securing additional land. This option would also only cover LCU compression, and would not mitigate risk around loss of feed to Enbridge. As a result, this option was not optimal and was rejected.

Increased Compression at Bright

Union considered increasing compression at Bright but dismissed the option due to the scope of the upgrades required. In order to use Bright compression as LCU protection for Parkway, the maximum operating pressure (MOP) of the pipelines between Bright and Parkway would need to be increased. A MOP increase would require full replacement of all pipe, as well as compressor modifications at the Bright station. Additional compression would be required as well to meet total flow requirements at the revised Bright discharge pressure. This option also does not mitigate risk around security of supply for Enbridge.

c) Union currently has two compressor plants at the Parkway station used for delivery into the TCPL system; Parkway A and Parkway B. The compression horsepower for each is:

- Parkway A: 24,000 hp
- Parkway B: 47,000 hp.

d) Please see the response at Exhibit J.B-1-1-2 a) and Exhibit J.B-1-1-2 b).

e) Please see the response at Exhibit J.B-1-1-2 a). All of the Parkway West Project facilities are proposed to be in-service on or before November 1, 2014.

f) Please see the response at Exhibit J.B-1-1-2 a) and response to a) above.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B, Tab 1, Table 2, Updated

a) Please add columns to Table 2 for 2007 through 2009 actual data.

b) Is there any change to capital expenditures, transfers or retirements forecast for 2012 and/or 2013 as a result of the actual figures for 2011? If yes, please explain.

---

**Response:**

a) Please see Attachment 1.

b) The capital expenditures, transfers and retirements forecast for 2012 and 2013 were not updated as a result of updating the evidence for 2011 actuals.

## Gross Plant Continuity Summary

| Line No. | Particulars ($ millions) | Actual 2007 | Actual 2008 | Actual 2009 | Actual 2010 | Actual 2011 | Forecast 2012 | Forecast 2013 |
|---|---|---|---|---|---|---|---|---|
| 1 | Opening balance | 5,243.3 | 5,278.1 | 5,606.1 | 5,772.4 | 5,913.8 | 6,140.9 | 6,298.3 |
| 2 | Capital expenditures | 258.1 | 370.4 | 248.8 | 201.1 | 282.8 | 232.7 | 312.5 |
| 3 | Transfers | (177.5) | (0.2) | 0.0 | 0.0 | 0.0 | 10.5 | 0.0 |
| 4 | Retirements | (45.8) | (42.2) | (82.5) | (59.7) | (56.2) | (85.8) | (78.7) |
| 5 | Closing balance | 5,278.1 | 5,606.1 | 5,772.4 | 5,913.8 | 6,140.4 | 6,298.3 | 6,532.1 |
| 6 | Average balance | 5,145.9 | 5,448.7 | 5,696.5 | 5,839.8 | 5,998.7 | 6,208.9 | 6,374.3 |

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B1, Tab 2, Updated

a) Please expand Table 1 to include actual data for 2008 and 2009.

b) Are the storage figures shown in Table 1 for regulated storage only? If not, please provide the storage capital budget for each of the years for the regulated component of storage only.

---

**Response:**

a) & b) Please see Attachment 1. Line 9 provides the regulated component.

## Capital Budget Summary by Function

| Line No. | Particulars ($ millions) | Proposed 2007 Budget EB-2005-0520 | Actual 2007 | Forecast 2007 | Actual 2008 | Forecast 2008 | Actual 2009 | Forecast 2009 | Actual 2010 | Forecast 2010 | Actual 2011 | Forecast 2011 | Forecast 2012 | Forecast 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (a) | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
| 1 | Storage | 10.0 | 7.2 | 6.6 | 8.8 | 6.1 | 4.0 | 3.0 | 17.9 | 19.2 | 36.9 | 37.4 | 14.3 | 13.5 |
| 2 | Transmission | 139.1 | 159.1 | 110.6 | 84.3 | 67.9 | 42.7 | 52.7 | 25.1 | 27.3 | 48.3 | 51.1 | 48.0 | 114.1 |
| 3 | Distribution | 89.6 | 93.7 | 91.6 | 113.1 | 112.8 | 95.5 | 93.3 | 101.8 | 99.0 | 112.3 | 116.5 | 125.9 | 155.8 |
| 4 | General | 50.0 | 29.5 | 34.3 | 30.9 | 29.4 | 23.6 | 24.7 | 32.8 | 28.9 | 39.0 | 38.0 | 37.7 | 38.5 |
| 5 | Overhead | 59.3 | 56.1 | 59.4 | 61.3 | 57.3 | 59.6 | 60.9 | 49.1 | 65.6 | 52.4 | 51.8 | 54.7 | 54.3 |
| 6 | Total | 348.0 | 345.6 | 302.5 | 298.4 | 273.5 | 225.4 | 234.6 | 226.7 | 240.0 | 288.9 | 294.8 | 280.6 | 376.2 |
| 7 | Less: Unreg S&T | 0 [2] | 1.5 | | 2.2 | | 0.5 | | 5.9 | | 13.1 | 15.2 | 3.0 | 2.2 |
| 8 | Less: Unreg General & Overhead | 0 [2] | 1.4 | | 0.4 | | 0.9 | | 1.2 | | 1.3 | 4.2 | 2.5 | 2.3 |
| 9 | Total Regulated | 348.0 | 342.7 | 302.5 | 295.8 | 273.5 | 224.0 | 234.6 | 219.6 | 240.0 | 274.5 | 275.4 | 275.1 | 371.7 |

**Notes:** (1) The forecast is prepared on the basis of total project costs, as such the forecast prepared for 2007 - 2010 inclusive, did not idenitfy unregulated amounts within projects for Storage, General and Overheads. The forecast for 2011-2013, inclusive were prepared as above but were subsequently reviewed to identify unregulated components of the projects within the forecast for the purposes of the filing for the 2013 Rate Case.

(2) The 2007 forecast applied for in EB-2005-0520 was applied for prior to the NGEIR decision and as such all items were considered regulated.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B1, Tab 4, Updated

a) Please provide a table that shows the distribution capital spending for 2007 through 2011 actual and the 2012 and 2013 forecast for each of the 6 types of expenditures shown on page 2. Please also include a total line in the table.

b) Please provide a table that shows the New Business total spending for the 2007 through 2013 period, including 2011 actuals, along with the customer attachments and the average cost per customer attachment.

c) When is the OPG Thunder Bay plant forecast to be in service?

d) What is the status of the provincial and federal funding related to the Red Lake project?

e) What is the current status of the Lambton Power Plant project?

f) What is the current status of the OPG Guelph plant project?

g) Please provide Union's vehicle replacement policy and the Spectra Energy Vehicle Replacement Guidelines.

h) Please provide a copy of the review of PHH Strategic Consulting.

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**Response:**

a) Please see table below showing the distribution capital spend:

| (in $ thousands) | 2007 Actual | 2008 Actual | 2009 Actual | 2010 Actual | 2011 Actual | 2012 Forecast | 2013 Forecast |
|---|---|---|---|---|---|---|---|
| New Business | 35,283 | 38,470 | 27,129 | 35,226 | 40,963 | 43,011 | 48,592 |
| Meter and Regulator Replacements | 6,956 | 8,907 | 12,047 | 13,363 | 12,500 | 12,032 | 10,958 |
| Main Replacements | 7,382 | 11,460 | 13,371 | 14,293 | 13,183 | 16,477 | 17,385 |
| Service Replacements | 1,768 | 1,773 | 1,114 | 1,942 | 1,712 | 2,400 | 2,616 |
| Specified Projects (*over $1million*) | 12,350 | 17,146 | 7,811 | 8,893 | 6,625 | 8,475 | 34,391 |
| Field Facilities | 4,090 | 13,097 | 14,536 | 7,328 | 10,850 | 14,000 | 13,575 |
| Total | 67,829 | 90,853 | 76,008 | 81,045 | 85,832 | 96,395 | 127,517 |

b)

| (in $ thousands) | 2007 Actual | 2008 Actual | 2009 Actual | 2010 Actual | 2011 Actual | 2012 Forecast | 2013 Forecast |
|---|---|---|---|---|---|---|---|
| New Business Portfolio Costs | 35,283 | 38,470 | 27,129 | 35,226 | 40,963 | 43,011 | 48,592 |
| Customer Attachments | 24,335 | 24,122 | 17,634 | 19,995 | 19,295 | 20,318 | 22,491 |
| Attachment Cost per Customer | 1.450 | 1.595 | 1.538 | 1.762 | 2.123 | 2.117 | 2.161 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Less: Loadings | 0 | 0 | 0 | 4,769 | 4,991 | 6,352 | 7,067 |
| Less: Cross Bore | 0 | 0 | 0 | | 1,100 | 1,100 | 1,100 |
| **Adjusted New Business Portfolio Costs** | **35,283** | **38,470** | **27,129** | **30,457** | **34,872** | **35,559** | **40,425** |
| Attachment Cost per Customer (adj. for loadings and cross bore) | 1.450 | 1.595 | 1.538 | 1.523 | 1.807 | 1.750 | 1.797 |

Year over year, attachment cost per customer generally trends upwards from 2007 to 2013. This trend is driven by a number of factors such as the inclusion of loadings directly charged to projects, the cross bore initiative, and the mix of customer attachments.

In 2010, Union changed how certain capitalized costs are allocated to capital. This was a change in allocation method and not a change in capitalization policy. Prior to 2010, these costs were charged to capitalized Overheads. In 2010, Union introduced a loadings process which allocated costs directly to projects. This change in how costs are allocated within capital resulted in more costs being charged directly to specific capital projects and less costs being charged to capitalized overheads (see lines 214 and 215, of Exhibit B1, Tab2, Summary Schedule 2). Prior to 2010, the loadings cost identified in the above table would have been capitalized within capital overheads, instead of in the new business projects portfolio.

Attachment costs have also increased as a result of the attachment mix shifting from new business residential service laterals to more expensive residential conversion service laterals. A residential conversion service lateral is an attachment of an existing built-up residence where a residential service is being installed for the first time; in contrast to a new residential service lateral which is not built-up. Providing service to an existing residential area is more costly as a pre-construction site visit is needed to identify potential private underground utilities. As well, working in built up areas often requires more time to install a service. In 2011, residential conversion service lateral volumes increased over 98% from forecast – which equated to approximately 26 % of gross attachments. This trend is expected to continue in 2012 and 2013.

c) The Thunder Bay plant is forecast to be in-service in November, 2013.

d) The Municipality of Red Lake has secured Provincial funding of $4.9 million and is awaiting approval of Federal funding of $2.7 million for Phase II of the Red Lake project.

e) Union has had preliminary discussions with OPG about a potential conversion of Lambton GS to natural gas firing. The Environmental Assessment has not been started. This project will require a Ministerial Directive to proceed.

f) The evidence at Exhibit B1, Tab 4, page 6 of 9 erroneously describes the Guelph plant project as an OPG facility. The project proponent is Envida Community Energy Inc., a wholly owned subsidiary of Guelph Hydro Inc.

The Guelph plant is expected to be in-service in 2013.

g) Union does not have a vehicle replacement policy but does have guidelines on vehicle replacement which are based on age and mileage criteria. Please see Attachment 1 and 2 for a copy of Union's Vehicles Policies & Procedures (see section 9.1) and the Spectra U.S. Fleet Vehicle Management Plan. The vehicle replacement practices differ because Spectra U.S vehicles are leased whereas at Union they are owned.

h) Please see the response at Exhibit J.B-4-1-3 b).

| UNION GAS CORPORATE MANUAL | Reference #: **6630-15** |
|---|---|
| Department: Logistics-Fleet | Issuer: Kathy Webster, Manager, Logistics |
| Subject: **Vehicle Policies & Procedures** | |
| Issue Date: 09-02-12<br>**Supersedes: 08-07-01** | Category: Policy |

**1.0 General Information** This document describes the policies and procedures that govern the use, maintenance, and administration of Union Gas vehicles. This document replaces all previous documentation with respect to Union Gas Transportation Policies and Procedures.

**2.0 Roles and Responsibilities:** The responsibility for Union Gas Vehicle Policies and Procedures and this resulting document resides with the Manager, Logistics, except where specifically identified below.

**Key Roles referenced:**
Manager, Logistics
Fleet Coordinator
Fleet / Warehouse Manager
Relationship Manager, Fleet Services Canada
Admin. Manager - Fleet Admin. Desk
Fleet Administration Desk

**3.0 Definitions**
**"Company"** refers to Ontario operations (Union Gas Operating unit) within Spectra Energy
**"Company Vehicle"** means any vehicle owned, leased or rented by the company
**“Employee"**for this policy means those employees, who as part of their regular job function or assigned duties are required to drive a Company Vehicle.
**'Valid Drivers Licence"** means the specific licence issued by the relevant provincial transportation licencing agency, to the employee, which is required by the employee to drive the specific Company vehicle.
**'Company Fleet Credit Cards"** refers to the individual charge card assigned to and provided for each vehicle through our credit card vendor PHH.
**Advantex -** the planning system used for Utility Services work.
**Global Positioning System ("GPS"):** a navigation or locating system used to collect vehicle information through satellites, cellular phone towers, or radio data infrastructure systems.

## 4.0: Driver Expectations

### 4.1 Highway Traffic Act and Municipal Bylaws

o All operators of a Company Vehicle, Leased / Rented Vehicles, and Personal Vehicles being used for company business, are expected to follow the requirements outlined in the Highway Traffic Act, as well as any Municipal Bylaws for the areas in which they operate (example parking, idling etc).
o Drivers should ensure they are familiar with, and comply with, these regulations. The driver is responsible for fines incurred against the Highway Traffic Act (e.g. speeding tickets, parking tickets etc).

### 4.2 Drivers Licences

o The Company requires that Employees must possess a Valid Driver's Licence in order to drive a Company Vehicle. The driver's licence must permit the employee to drive the specific classification of Company Vehicle.
o Any Employee must immediately report a change in status of their Driver's Licence to their manager. (e.g. expiration, class change, suspension, revocation or requirement for special condition).
o Any questions which an Employee may have regarding a Valid Driver's Licence, or vehicle operating requirements, should be directed to their Manager or the local Fleet / Warehouse Manager.

### 4.3 Vehicle Information and Reporting Requirements and Access

o In order to maintain the vehicle preventative maintenance schedules and provide data for monthly / annual incident rates on the Company Scorecards, odometer readings or hourly usage readings (for mobile equipment) need to be collected on a regular basis. Odometer and hourly usage information will be collected as follows:
o Where the vehicle is equipped with Advantex, the driver is responsible for recording the mileage and vehicle number daily into the system. The vehicle number is to be input as the 6 digit vehicle number.
o For vehicles not equipped with Advantex, odometer readings are to be called into the Fleet Admin. Desk on a monthly basis.
o For mobile equipment, usage hours are to be recorded at preventative maintenance intervals.
¯ GPS systems may be installed on Union Gas vehicles and can be used to provide vehicle location, vehicle telemetry information (e.g. Odometer readings, vehicle speed, idling etc.), or for secondary verification purposes.
o Access to GPS data will be determined by individual's job requirements. Personal information will not be disclosed outside the company except where required by law or as permitted under any applicable privacy policy and legislation.

## 5.0 Fleet/Vehicle Assignments, Specifications and Sourcing

### 5.1 Assignment of Company Vehicles

o The company may choose to assign company-identified vehicles to its employees to enable them to do their work and/or to allow them to respond in an expeditious manner to emergencies. Note that Managers within Operations are NOT entitled to the use of a company vehicle. See Roles Eligible for Company Vehicles below.

**5.1.1 Eligibility for Company Assigned Vehicles** The following list identifies roles that require a Company vehicle.
Note that any other individuals/roles requiring vehicles would be considered by the Manager, Logistics on an exception basis only.

o Utility Services Team Leads (in the North)
o Construction Superintendents and/or Team Leads - those that require daily transportation to supervise field crews will be provided with the option of a Company vehicle, or may use their personal vehicle and claiming mileage expenses at the published rate. If using a Company vehicle, the Superintendent/ Team Lead must keep the vehicle as described in the current replacement policy.
o Technicians
o Utility Service Reps (including grandfathered roles)
o Line Locate Reps
o Meter Readers
o Welders
o C&M Utility Persons
o QA Verifiers
o STO Reps as defined
o GaragesjWarehouses as required.

Each role has been designated a specific standard vehicle. The Relationship Manager Fleet Services Canada maintains these Corporate Specifications, in consultation with the Fleet / Warehouse Managers. Any request for a different vehicle requires completion of a Justification Form and approval by the Manager, Logistics.

**5.2 Other Vehicles Used for Company Business**
Employees who do not have a company vehicle assigned to them for business purposes may use their personal vehicle for company business, or rent a vehicle to carry about business, pending approval by the employee's manager. The employee will be reimbursed as per the current reimbursement rate as defined by Human Resources. Reimbursement can be obtained through the regular Accounts Payable Expense Reimbursement process. Employees are required to notify their personal vehicle insurance provider as appropriate.

Please refer to the Corporate Policy related to vehicle rentals to ensure appropriate reporting and insurance coverage requirements are met.

**5.3 Pool Vehicles Used For Company Business**
Currently, there are no specified pool vehicles for general use within Union Gas. In some cases, a manager may have been assigned a vehicle for the collective use of their team and will operate this vehicle in a pooled mode. All administrative responsibilities associated with managing this vehicle in a pooled manner (i.e. vehicle reservations, key hand-offs etc) reside with the manager to whom the vehicle is assigned.

**5.4 Fleet / Vehicle Transfers**
If an employee moves to another position and a vehicle is required in that role, the employee will retain the vehicle. If an employee moves to a position that does require a vehicle, the company vehicle will remain at the employee's original report base.

The local Fleet / Warehouse Managers are responsible for working with local Managers to determine the specific unit assignments to ensure that the use and availability of assets within the entire company fleet is optimized.

The driver's Manager is responsible for notifying the Fleet / Warehouse Manager or the Fleet Admin. Desk with any / all changes associated with the driver assignment and the home base of the vehicle. This requires the completion of a Form 2299.

If Mobile Equipment units are moved between Managers, the receiving manager is responsible for completing the Form 2299 and notifying the Fleet Admin. Desk for all changes to the equipment location.

### 5.5 Vehicle Identification

All vehicles are identified as a Company vehicle by the following items:
o A Unique Vehicle Number: this 6 digit number is composed of the Company assigned vehicle number (4 digits) followed by the model year of the vehicle (last 2 digits of the year). This six digit vehicle number is an important identification code for the vehicle.
o The Union Gas logo.

### 5.6 Fleet / Vehicle Manufacturer Selection / Sourcing

The determination / selection of the vehicle (e.g. Ford, John Deere) is done as a whole for Spectra Energy to ensure that the entire spend is leveraged when negotiating process / services. Spectra Energy Corporation is responsible for sourcing the vendor. Union Gas is represented in these sourcing decisions via the Relationship Manager, Fleet Services Canada.

### 5.7 Fleet / Vehicle Maintenance vendor Selection / Sourcing

The Manager, Logistics is responsible for determining the sourcing strategy for vehicle maintenance (in-house garages or external garages).

Where external garages are employed, the responsibility to source the individual garages resides with the Fleet/Warehouse Managers. Where external garages are employed, relationships have been established with specific garages and these garages have been made aware of the company maintenance standards and are set up to accept the company fleet credit cards.

Managers and/or employees responsible for vehicle maintenance are expected to have work done at these local approved garages or at in-house facilities where available. For specific information about preferred garages within a local area, contact the Fleet Admin Desk.

## 6.0 Use of Company Vehicles

### 6.1 Authorized use of Company Vehicles

The assigned company vehicle can be used in the following:
o Business purposes
o Transportation to / from work - where local management has approved and implemented a vehicle take home policy. Having access to the company vehicle for this purpose is considered a taxable benefit (see 6.2, "Taxation on Personal Use of Vehicles")
o Transportation to / from work while on standby - Note that this is considered a taxable benefit depending on the role (see 6.2 "Taxation on Personal use of Vehicles")

The assigned company vehicle cannot be used in the following situations:
o Operation by non-employees
o As a transportation vehicle. That is, members of an employee's family (including, but not limited to their spouse and dependant children), friends and any non-employee cannot ride in the vehicle. This is prohibited without prior approval by local management. Local management should consider insurance implications when evaluating these requests and consult with Insurance Services for guidance as necessary.
Other use of the vehicle while on duty or if on standby will be determined by local management.

### 6.2 Taxation Procedures Associated with Personal Use of Vehicles

According to Revenue Canada, the following personal vehicular use is classified as personal mileage, and a taxable benefit:

o All kilometers accumulated on a vehicle that are non-business
o Mileage to / from work

Individual employees driving company vehicles are responsible: a) to track business vs. personal mileage, b) to maintain the necessary records for audit purposes and c) to report this information annually to payroll.

Human Resources is responsible for communicating this policy annually and for requesting the necessary inputs.

## 7.0 Fleet / Vehicle Related Purchases

### 7.1 Payment for Vehicle Expenses

Each vehicle is assigned its own unique credit card that must be used for expenses associated with that vehicle. No other means of payment for expenses is acceptable.
Responsibility for the authorization of these charges is listed in the following table:

| **Charge Amount** | **Authorization Required** |
|---|---|
| Less than $100 | Driver authorization |
| Greater than $100 and less than $1500 | Vendor contacts PHH |
| Greater than $1500 | Vendors contacts PHH; Fleet / Warehouse Manager authorizes |

### 7.2 Use of Fleet Credit Card

The driver is responsible to ensure that the quantity and type of fuel, oil, costs and details of services and reports purchased are noted on the sales slip and are accurate.

The credit card should be kept in the vehicle - out of sight for security and out of direct sunlight to prevent deterioration. In most vehicles the card should be kept in a locked glove compartment. It is the responsibility of the Driver / Manager to notify the Fleet Admin. Desk immediately, if any credit cards are lost, stolen or damaged.

The company is liable for billings resulting from Fleet Credit Card transactions. Recovery of cards from terminated employees is the responsibility of the Manager of the card user.

### 7.3 Fuel Suppliers and Fuel Types

Arrangements have been made with several major gasoline retailers for fuel discounts. Drivers are expected to purchase gas from a preferred vendor where purchasing options are available. A current list of preferred vendors can be attained from the Fleet Admin Desk

Drivers are expected to use **regular unleaded fuel** and to use **self service pumps** when fueling the company vehicles. Premiums and mid-grade gasoline and full service pumps typically have price premiums of up to $.10/litre. The vehicle will operate satisfactorily on regular gasoline.

## 8.0 Fleet / Vehicle Maintenance and Repairs

### 8.1 Routine Maintenance / Inspections

Regular scheduled maintenance is critical to ensure the safe reliable working condition, minimize downtime, and extend the life of the vehicle.

Drivers are responsible for routine care and maintenance of the vehicle. This includes:
o Checking oil when the Company vehicle is refueled.
o Conducting regular visual inspections of the vehicle for obvious maintenance or mechanical problems.
o Reporting any problems immediately to their Manager (for CVOR vehicles a daily pre-trip inspection is mandatory).

### 8.2 Regularly Scheduled Preventative Maintenance

The Fleet Admin Desk issues Preventative Maintenance (PM) request. The PM requests issued through the Fleet Admin.

Desk are based on:
o Maintenance schedules defined by the Fleet / Warehouse Managers that are in line with manufacturer maintenance guidelines
o Maintenance / testing required to ensure that the vehicle complies with the Ministry of Transportation guidelines (Emission Testing, CVOR Licensing etc).

The driver / manager is responsible for ensuring that the vehicle maintenance is complete according to these requests.

### 8.3 Unplanned Repairs / Breakdowns

With regularly scheduled maintenance, it is anticipated that unplanned breakdowns and repairs will be minimized.

If an unplanned repair or breakdown occurs, use the following process as applicable:
o **During working hours (7:00am - 5:00pm):** Drivers should notify their manager and Planning & Dispatch of a breakdown. Planning & Dispatch will contact the Fleet Admin. Desk to have a tow truck arranged.
o **After working hours:** Drivers notify Planning & Dispatch. Planning & Dispatch will contact an appropriate towing company.

### 8.4 Replacement Tires:

Any replacement fleet tires must meet the original equipment tire load rating as a minimum standard and must match the original equipment tire size.

Class 1 and Class 2 vehicles will have 4 winter tires (bearing a pictograph of a peaked mountain and a snowflake on the tire wall) installed during winter months. Any exceptions must be approved by the Fleet/Warehouse Manager.

### 8.5 licence Plate Renewals

All vehicles must have a valid licence plate. The Fleet Admin Desk is responsible for administering licence plates and renewals. The licence plate stickers are distributed to the Driver / Manager on an annual basis.

It is the driver's responsibly to ensure they are driving a vehicle with current plates / stickers. If plates are lost or stolen, the driver should notify their manager and the Fleet Admin. Desk to arrange for replacement plates.

## 9.0 Fleet / Vehicle Replacement and Disposal

### 9.1 Vehicle Replacements

The following table describes the vehicle replacement guidelines. The replacement criteria have been defined on a Spectra Energy basis and the responsibility to follow these guidelines within Union Gas rests with the Relationship Manager, Fleet Services Canada.

Note that these are guidelines only and actual replacement decisions are made based on a number of factors including available of capital funds. Finalizing the list of vehicle replacement each year is the responsibility of the Manager, Logistics.

| Vehicle Type | Replacement Criteria |
|---|---|
| Car | o Five years or 160,000 kilometers |
| Light Vans, Pickup trucks less than 4560kg (1/4 ton, ½ ton, 3/4 ton and 1 ton) | o Five years or 160,000 kilometers |
| Medium Duty Trucks 5000-7000 kg (cab and chassis with optional bodies) | o Six years or 160,0000 Kilometers (gasoline)<br>o Ten years or 250,000 kilometers (diesel) |
| Heavy Duty Trucks greater than 7000 kg (cab and chassis with optional bodies) | o Twelve years or 350,000 kilometers |
| Mobile Equipment | o Five to twelve years depending upon the type of equipment |

**9.2 Disposal of Company Vehicles**
The Relationship Manger, Fleet Services Canada is responsible for the disposal of all Company vehicles at the end of their useful life. Disposal is handled through Riegling Brothers - Truck, Auto and Equipment sales. Employees can contact the disposal company directly if they are interested in negotiating an independent purchase of any company vehicle. You can contact the disposal company at: Riegling Brothers Truck, Auto and Equipment sales, Chatham, Ontario (519) 354-6119.

**10.0 Other**

**10.1 Vehicle Safe Operating Practices**
Training related to the safe operation of vehicles is included as part of the EHS training matrix. Please refer to EHS information on the Portal.

Certain vehicles have a CVORdesignation (yellow sticker on window) and are required to comply with Ministry of Transportation guidelines (e.g. daily pre-trip inspections and associated log; documentation on the vehicle etc.).

For general information on CVORlicencing please refer to the Ministry of Transportation website.

**10.2 Fuel Conservation and Environmental Stewardship**
Drivers should operate all vehicles in a manner that minimizes fuel usage and the associated environmental impacts, including;
o Avoid unnecessary idling; ensure compliance with municipal bylaws
o Engine must be turned off when vehicle is unoccupied
o Drive at a moderate and steady speed observing all posted speed limits
o Accelerate vehicles gently from a stop
o Anticipate traffic flow conditions in an effort to minimize braking
o Plan your route or destination in order to avoid unnecessary mileage
o Ensure the vehicle is properly serviced according to the requirements managed through the Fleet Administration Group.
o Avoid spillage while refueling by filling the tank at a moderate rate and not overfilling
o Ensure that all accessories are turned off when not required (i.e. rear window defroster).

**10.3 Vehicle Accident Reporting and Theft**
The driver is responsible to notify their Manager, or designate, of any and all accidents at the time of the accident. In turn, the Manager can notify Insurance Services, EH&S and the Fleet Admin., so that a repair and / or replacement strategy can be defined.

An information package was included in the glove box when the vehicle was first purchased that outlines actions to be taken in the event of a vehicle accident. This information is to be retained in with the vehicle. Replacement information packages can be provided by the Fleet Admin. Desk if the original package is missing.

## 1.0 INTRODUCTION

This plan provides guidance for the management of the vehicles used by the Company and its employees in the course of their employment. It establishes the minimum standards to ensure compliance with applicable laws and regulations and manage the risk associated with operating Company Vehicles. The Plan's purpose is to:

- Promote vehicles that are:
  - Properly located to meet local conditions and workload.
  - Used to the most economical extent possible.
  - Of high quality.
  - Dependable transportation that helps employees meet the mission of the Company and its goals while meeting or exceeding the expectations of our customers.
- Promote the safe operation and use of such vehicles, and prevent injuries and incidents in line with our safety vision of having a zero injury and zero incident culture.
- Ensure that all employees who drive Company fleet vehicles meet all local, state and company qualifications to drive a motor vehicle.

## 2.0 SCOPE AND APPLICATION

This plan applies to any employee who operates a vehicle or equipment (hereinafter referred to individually as a "Driver" and collectively as "Drivers") owned by the Company (a "Company Vehicle) and vehicles or equipment leased or rented by the Company (an "SET Leased Vehicle") and personal vehicles being used for company business (a "Personal Vehicle Used for SET Business").

## 3.0 DEFINITIONS

None

## 4.0 RESPONSIBILITIES

### 4.1 General

4.1.1 The Company may, from time to time, assign Company Vehicles to its employees for commuting to and from their residence to enable expeditious response to emergencies on the pipeline system and for other business-related purposes.

4.1.2 Region General Managers, Area Managers and Directors of Technical Operations that are on stand-by duty may use the vehicle for general transportation within their immediate vicinity to enable timely response to emergency or operational situations.

NOTE – *Use of Company Vehicles to transport an employee's family or non-employees (except on Company business) is strictly prohibited.*

4.1.3 See Appendix A for information regarding taxation and withholding procedure for commuting use of a Company Vehicle.

4.1.4 The Company has determined that the employees in the job classifications listed below may be allowed to commute to and from their homes in a Company Vehicle to facilitate the employee's response to emergencies or other work call-outs:

- Region General Manager
- Plant Manager
- Director, Technical Operations
- Technical Specialists
- Senior Technical Specialists
- Region Staff Employees (as approved by Vice President/Division General Manager)
- EHS Managers
- EHS Specialists
- Area Construction Manager
- Area Manager
- Field Construction Superintendent
- Construction Superintendent
- Area Supervisor
- Associate Supervisor
- Principal Environmental Construction Permitting Specialist
- Principal Engineer
- Right-of-Way Representative
- Area Technician (as approved by Vice President/Division General Manager)
- Pipeline Specialist
- Station Specialist (see exceptions to base vehicle in Section 5.9)
- Mechanic (see exceptions to base vehicle in Section 5.9)

### 4.2 Area/Regional Management

4.2.1 Ensure that employees adhere to all company policies and procedures and proper monitoring is conducted.

### 4.3 Employees

4.3.1 Understand and adhere to all company policies and procedures and provide semi-annual reporting regarding condition and maintenance of each vehicle in use.

4.3.2 Serve as primary contact for information regarding a particular vehicle including performance and maintenance issues and suitability for the vehicle's intended use.

4.3.3 Comply with all local and state driving regulations including proper licensing and insurance coverage.

### 4.4 Contract Employees

4.4.1 Contract employees who work under the direction of a Company employee in their day-to-day work and who perform a task integral to daily operations have the same responsibilities in Section 4.2.

4.4.2 Contract employees assigned to the Company who are employed by and work under the direction of a third party entity may not drive Company Vehicles, Leased Vehicles or Personal Vehicles Used for company business.

### 4.5 Region Health & Safety

4.5.1 Provide technical support and guidance to facilities relatively to the Fleet Management Plan requirements.

### 4.6 Houston Health & Safety

4.6.1 Provide technical support and guidance to Region Health & Safety and facilities relatively to the Fleet Management Plan requirements.

## 5.0 REQUIREMENTS

### 5.1 Driver Qualification

5.1.1 This Plan includes a comprehensive driver qualification and management program for all prospective and existing drivers and establishes and clearly defines the following expectations:

**New Hires**

5.1.2 As a condition of employment, all prospective employees with responsibilities that include driving a Company Vehicle or Leased Vehicle must meet the following minimum requirements:

- Valid driver's license to operate a motor vehicle.

- Driving record free of violations of applicable law obtained from all states in which the new employee has received a driver's license (See Appendix D for more information regarding the motor vehicle records procedure).
- Successful completion of a company defined driver education course within ninety (90) days of hire.

**Current SET Employees**

5.1.3 As a condition of continuing employment and use of a Company Vehicle, all employees must complete company defined driver education classes.

5.1.4 The Company will ensure that:

- All Drivers complete a company approved driver education class appropriate for the type of vehicle and conditions in which it will be driven that includes, but is not limited to, the following:
  - Defensive driving.
  - Driving in inclement weather conditions.
  - Fatigue management.
  - Driving safely around novice and aging drivers.
  - Animal avoidance.
- All such training be completed within ninety (90) days of approval of this policy and that training be completed every three years during employment by the Company;
- Continuous driver assessments must be completed every calendar year for each company employee assigned a Company Vehicle (*See* Appendix D attached hereto for detailed information regarding the Spectra Energy Driving Improvement Plan). The assessment will include:
  - An annual review of employees' driving performance and driving record with the company and in the state in which the vehicle is operated and the state in which the employee is licensed (if different states).
  - Suggested improvement actions for drivers with unsatisfactory driving records (i.e. disciplinary actions, counseling sessions, driving restrictions, remedial training, etc.
  - An evaluation to determine that Drivers are physically fit (i.e. general health, vision, etc.) to operate vehicles and are capable of performing assigned driving tasks which verification can be obtained by ensuring all company drivers have a valid driver's license which complies with federal and state laws.
  - Department of Transportation Commercial Drivers.

5.1.5 Following requirements of HS-57 DOT Driver Safety. These company drivers transporting cargo in interstate commerce regulated by the Federal Motor Carrier Safety Administration ("FMCSA").

## 5.2 Change in Status

5.2.1 All Drivers must report any change in the status of his or her driver's license or driving record to their manager immediately upon notification of such change. It is the obligation of all Drivers to monitor their own legal status and ability to drive and to self report any change to their manager.

## 5.3 Vehicle Operation

5.3.1 **State and Federal Law / NHTSA Guidelines** – All Drivers must comply with the laws and regulations of each state in which they drive a Company Vehicle, Leased Vehicle or Personal Vehicle Used for company business in accordance with the guidelines issued by the National Highway Traffic Safety Administration, promulgated under the Highway Safety Act of 1966, as amended.

5.3.2 **Seat Belts** – The use of seat belts is mandatory at all times for all Drivers while operating a Company Vehicle, an leased Vehicle or a Personal Vehicle Used for company business.

5.3.3 **Smoking** – Smoking is prohibited in all Company Vehicles and Leased Vehicles

5.3.4 **Alcohol Consumption and Impaired Driving**Alcohol shall not be consumed while operating a Company Vehicle, an Leased Vehicle or a Personal Vehicle Used for company business. Under no circumstances shall a Driver operate a Company Vehicle, an Leased Vehicle or a Personal Vehicle Used for company business while impaired.

5.3.5 **Traffic Violations and Tickets** – Drivers are personally responsible for any traffic violations and traffic tickets issued while driving a Company Vehicle, an Leased Vehicle or a Personal Vehicle Used for company business and are required to notify his or her immediate manager within 24 hours of any such violations.

5.3.6 **License Suspension** – Drivers whose driving privileges have been suspended by the State must inform his or her immediate manager within 24 hours of the suspension.

5.3.7 **Vehicle Incidents**In the event of an incident involving a Company Vehicle, an leased vehicle or a Personal Vehicle Used for company business, all Drivers are required to:

- Stop the vehicle immediately, or as soon as it is safe and as near the site of the incident as practical.
- Provide or ask for assistance as necessary.
- Secure medical attention for yourself or other injured parties.
- Do not admit fault or assign blame to others.
- Always contact the police and file a report.
- Notify your manager and Safety Specialist of the incident as soon as possible.

- Call PHH Arval ("PHH") at 1-800-446-7052. A PHH representative will take a detailed accident report, arrange for towing of the vehicle if necessary and assist you with repairs.
- Refer to the PHH Vehicle Accident Management Program on the Source for information relating to reporting vehicle accidents.
- The driver will fill out an Incident Data Collection Form HSF-004.
- The company is not responsible for damage to Personal Vehicles Used for business. Any claims should be made with your personal insurance provider. Mileage reimbursement is intended to cover the total cost of operating the vehicle including the cost of insurance.
- It is the responsibility of the manager to assure the incident investigation and document all vehicle incidents in order to protect the employee and the company and to comply with all applicable laws.
- Notify the affected employees department through organizational channels if there is personnel injury or significant damage.
- Notify Corporate Insurance in the event of a serious incident involving third parties. Provide Corporate Insurance with the name and address of the third party.
- PHH will forward information on the incident to Houston Fleet Services and Houston Health & Safety within 24 hours of initial incident notification.
- Houston Fleet Services will contact the driver to verify PHH incident information.

5.3.8 **Electronic Devices** – The use of cellular telephones and other electronic devices, including but not limited to laptops, Blackberries, pagers, two way radios, and on-screen navigational systems, is prohibited while operating a Company Vehicle, a Leased Vehicle and/or a Personal Vehicle Used for company business. Drivers must ensure that they are safely parked before using any electronic devices. This policy does not prohibit Drivers from operating a vehicle while the electronic device is turned on and operational. See Appendix C – Distracted Driving Policy)

5.3.9 **Drivers on Call** – Drivers, who are on call and are required to use a cell phone, Blackberry or personal pager in the course of their employment with the Company in order to respond to emergency situations, will be called by dispatch.

- Cell phones, Blackberries or pagers must remain on while driving.
- When called or paged, Drivers must find a safe spot to pull over to answer/return the call or view the order/messages and if necessary, call in to the dispatcher.
- Drivers should then proceed in accordance with established response procedures.
- Note that Company Vehicles are not designated as "emergency vehicles." As a result, when responding to a natural gas emergency, Drivers must comply with all applicable federal and state laws and regulations.

5.3.10 **Vehicle Security** – Company Vehicles and Leased Vehicles left unattended must be properly parked with engine turned off, keys removed, windows closed, and all doors locked. Exceptions area those occasions when the vehicle must be left running to clear a freeze.

5.3.11 Please ensure that your Company credit card is not left in the vehicle. The Company is not responsible for any personal items which may be lost or stolen from Company Vehicles, Leased Vehicles or Personal Vehicles Used for company business. Any claims in this regard should be made to the individual's personal homeowner's insurance provider or other personal insurance carrier as applicable.

5.3.12 **Securing Cargo and Maintaining Visibility** – All potential projectiles in and around a Company Vehicle, Leased Vehicle or a Personal Vehicle used for company business must be secured and complete visibility of all windows and mirrors must be assured (i.e., remove ice, snow, and excessive dirt or mud) before operating such vehicle.

5.3.13 **Parking Vehicles** – Drivers should park in parking spots that allow a vehicle to be driven in and driven out so that backing up is eliminated. When required to park in spaces, driveways, etc., where backing up will be necessary, Drivers should "back in" on arrival and "drive forward" on departure unless it is unsafe to do so.

## 5.4 Vehicle Maintenance

5.4.1 The Company will rely on a company-approved third party vendor to provide a comprehensive vehicle integrity and maintenance program that includes vehicle performance and specifications, and vehicle maintenance alerts to Drivers.

5.4.2 The Company will implement a pre-trip vehicle inspection policy to be followed by Drivers prior to driving on a regular basis and prior to road trips of more than two (2) hours in length.

## 5.5 Vehicle Performance and Specifications

As part of the Company's vehicle procurement process, vehicle performance and specifications will be evaluated on an ongoing basis.

5.5.2 The evaluation will be shared with management responsible for fleet purchasing and/or budgeting. The evaluation should include information on:

- Standard Features (i.e. power steering, power brakes, automatic transmissions, crash avoidance systems).
- Suitability for designated purpose.
- Crash Test and Rollover Ratings.
- Safety Features (i.e. ABS, front and side airbag systems, stability systems, rear vision or detection devices, night vision enhancement systems).
- Ergonomic Features (i.e. ease of access, egress, movement within and ability to work from or in the vehicle).
- Equipment Storage Requirements (including access to the material, methods of securing, and security).

- Vehicle Specifications (i.e., cargo and towing capacity, load position).
- Emergency Equipment (i.e., first aid kit, flashlight, reflective safety vest, fire extinguisher, reflective triangle/flares, cold weather emergency items).
- Tire Requirements.

**5.6 Vehicle Inspections**Pre-trip vehicle inspection requirements include the type of inspection, items to be inspected, and documentation requirements based on the vehicle type and use.

**5.7 Vehicle Maintenance**To assure vehicles are safely maintained, a comprehensive maintenance program will be established by a company approved third party vendor which includes the following notifications sent to Drivers by email and United States mail regarding:

- Regularly required inspections, maintenance and repair requirements in accordance with the vehicle manufacturer's recommendations which includes frequency of inspections, qualifications of local repair shops and technicians, an itemized list of systems and/or parts to be inspected, and recordkeeping requirements.
- Manufacturer recall processing.
- Vehicle repair scheduling priority criteria for safety related deficiencies.
- Vehicle replacement criteria.
- Vehicle withdrawal from service procedures (based on inspections or maintenance).
- Maintenance of individual vehicle maintenance records.

**5.8 Safety Equipment**

5.8.1 Field company vehicles must carry the following: minimum safety equipment:

- First Aid Kit.
- Fire extinguisher (size determined by Facility Management and Regional Health & Safety Specialist).
- Emergency roadside kit.
- Flashlight.
- Incident Data Collection Form HSF-004.

## 5.9 Vehicle Specifications and Modifications

5.9.1 **Vehicle Specifications** – Leased Vehicles shall be issued based on job category and shall be white in color. Base vehicles based on specific job categories are as follows:

| Job Title | Standard Vehicle |
|---|---|
| Analyst Div IT | SEDAN; MINI CARGO VAN |
| Analyst Network LD | SEDAN; MINI CARGO VAN |
| Coord Environmental Div | SEDAN |
| Coord Safety | SEDAN |
| Dir Regional | SEDAN; 1/2T - 3/4T SC 4WD PU |
| Region Technical Ops | SEDAN |
| Engineer | SEDAN |
| Engr Prin | SEDAN; 1/2T - 3/4T SC 4WD PU; SUV |
| Gen Mgr Region | SEDAN |
| Mechanic | 3/4T RC - SC 2WD PU |
| Mgr Area/Constr Area | SEDAN; 1/2T SC 2WD - 4WDPU; SUV |
| Mgr HR | SEDAN |
| Mgr Pipeline Ops | SEDAN |
| Mgr Plant Ops | SEDAN |
| Opr | 1/2T RC 2WD PU; 3/4T RC 4WD PU W/SNOWPLOW |
| Opr Equip | 3/4T RC 4WD PU |
| Pipeliner | 1/2T - 3/4T SC 4WD PU |
| Pipeliner Utility | 1/2T - 3/4T SC 4WD PU |
| Rep ROW | SEDAN; 1/2T RC 2WD PU |
| Rep Safety | SEDAN |
| Spec Environ Permit | 1/2T - 3/4T SC 4WD PU; SUV |
| Spec Pipeline | 3/4T SC 4WD PU; 1T 2WD - 4WD RC - SC UTLTY TRK |
| Spec Station | 1/2T - 3/4T RC 4WD PU |
| Spec Tech Region | SEDAN; 1/2T RC 2WD PU |
| Spec Tech Sr | SEDAN; 1/2T RC 2WD PU |
| Supt Const FId | 1/2T SC 2WD PU; SUV |
| Supv Area | 1/2T SC 2WD - 4WD PU |
| Supv Assoc | 1/2T SC 2WD - 4WD PU |
| Supv ROW | SEDAN |
| Tech Corr | 1/2T - 3/4 SC 4WD PU |
| Tech Elec/Contr | 1/2T - 3/4 SC 2WD PU |
| Tech Equip Analyst | 1/2T SC 2WD PU |
| Tech Meas | 3/4T SC 4WD PU |
| Tech Multi | 3/4T SC 4WD PU |
| Tech Telecom | 3/4T SC 4WD PU; FULL SIZE CARGO VAN |

## 5.10 Exceptions

5.10.1 Employees with job requirements which may require a Company Vehicle may be assigned a Company Vehicle with the approval of his or her Region Area Manager, General Manager or Vice President.

5.10.2 Exceptions to base vehicles listed above must be justified by site specific situations including job requirements, construction activity, encroachment frequency, on-call or other cost-effective situations to the Company.

5.10.3 Exceptions must be evaluated and approved by the Region General Manager, General Manager or Vice President.

**5.11 Vehicle Modifications**The Company has established a vehicle modification procedure which will be coordinated and reviewed by Fleet Services.

5.11.2 All reviews shall be sufficiently detailed to ensure that proposed modifications do not create an unsafe condition or impair and/or circumvent the function of any safety device.

5.11.3 Any Driver may suggest modifications; however, any significant vehicle modification shall be first approved by a vice president or above and Fleet Services will be consulted throughout the process.

5.11.4 All orders requesting modifications shall be placed directly by Fleet Services.

5.11.5 Major modifications include:

- Changing body configuration.
- Increasing carrying/hauling capacity.
- Accessibility aids.
- Cargo containment racks.
- Trailer hitches.
- Tire replacements (based on weather and terrain conditions).
- Navigation systems.

5.11.6 Management will have final approval authority for minor vehicle modifications. Minor modifications include:

- Window tinting.
- Security systems.

5.11.7 Modifications not listed above will be considered moderate and discussed with Fleet Services before ordering.

## 5.12 After-Market Equipment

5.12.1 The addition, after-market equipment or accessorizing of Company vehicles must be approved by the appropriate Manager.

5.12.2 The addition, the following types of after-market equipment is prohibited:

- Radio/CD players or similar equipment.
- Non-Company decals.
- Bug/wind guards.
- Driving lights.
- Mud flaps.
- Additional tinting to windows.

5.12.3 The addition, the following types of after-market equipment requires the approval of management:

- Winches.
- Cab steps or running boards.
- Trailer hitch receivers.

5.12.4 Exceptions – Exceptions to base vehicle modifications must be justified by site specific situations including job requirements, construction activity, encroachment frequency, on-call status or other similar situations.

5.12.5 Exceptions must be evaluated and approved by Management.

## 5.13 Vehicle Replacement

5.13.1 The vehicle withdrawal/replacement procedures will be coordinated with Fleet Services. They will include all situations for vehicle withdrawal/replacement, sign-offs and documentation requirements.

5.13.2 Fleet Services will handle the disposal of all Company Vehicles at the end of their useful life to the Company.

5.13.3 Justification for replacement of existing fleet units requires Region General Manager's approval

5.13.4 Factors to be considered in withdrawal or replacement of fleet vehicle include:

- Total mileage.
- Maintenance cost and frequency.
- Condition of vehicle.
- Operational requirements.
- Operating environment.
- Hours of service.
- Safety of vehicle.

## 5.14 Supplemental and Pool Vehicles

5.14.1 Rental vehicles to supplement additional pool vehicle requirements at the Region Office may be rented on an as needed basis and must be approved by the Region General Manager or his appointee.

5.14.2 Region pool vehicles are to be used by Region Staff and coordinated by the Region General Manager or his appointee. Pool vehicles are to be used for out of town travel and local company business but not to be used for commuting to and from work.

### 5.15 Temporary Requirements

5.15.1 Short term rentals require Region General Manager's approval.

### 5.16 Current Replacement Policy

5.16.1 These are replacement guidelines. It is up to the Region General Manager's discretion to keep vehicles longer or trade them in sooner, depending on the performance and condition of the vehicles.

| Class | Type | Replacement Criteria |
|---|---|---|
| 11 | Sedans | 100,000 miles/5 years |
| 13 | Light Trucks (1/2, 1/4 & 1 Ton) | 100,000 miles/5 years |
| 14 | Welding/Stake Bed Trucks | 100,000 miles/5 years |
| 15 | Winch Trucks | 150,000 miles/7 years |
| 16 | Truck Tractors | 300,000 miles/10 years |
| 17 | Trailers | Condition/20 years |

### 5.17 Operational Procedures and Considerations

5.17.1 Drivers must comply with the Company's Vehicle Operational Procedures Program that includes the following policies:

- Company Vehicle Use Requirements which includes business and personal use guidelines, incident reporting and investigations and routing and Scheduling Requirements (see Appendix B).
- Distracted Driving Policy (see Appendix C).
- Driving Improvement Plan (see Appendix D).
- Additional policies or procedures based on specific requirements governed by federal or state laws and regulations, or new equipment, technologies, etc. introduced into the vehicle/driving environment.

### 5.18 Recordkeeping, Reporting and Analysis

5.18.1 In coordination with Fleet Services, Environmental Health & Safety and Human Resources, the Company will assist in maintaining a comprehensive process for recording and reporting the following:

- Driver records and performance history as self-reported by drivers and as shown by a motor vehicle records search (See Appendix D).
- Driver training.
- Vehicle incidents.
- Driver safety metrics.

- Vehicle incident investigation.
- Data analysis and trending.
- Any other regulatory records as may be required.

5.18.2 In addition, the following documents must be kept with all Company Vehicles and Leased Vehicles:

- Valid Vehicle Ownership (annual renewal).
- Valid Registration in the state in which the vehicle is registered (annual renewal).
- Valid Certificate of Insurance (annual renewal).
- Valid Vehicle Inspection Certificate (annual renewal).
- Copy of DOT Certificate (no expiration date).

## 6.0 DOCUMENTATION

**6.1** Incident Data Collection Form HSF-004.

## 7.0 TRAINING

**7.1** Review training requirements in SOP HS-14 (Health & Safety Training).

## 8.0 REFERENCES

**8.1** Appendix A – Taxation and Withholding Procedure for Commuting Use of a Company Vehicle

**8.2** Appendix B – Company Vehicle Use Requirements

**8.3** Appendix C – Distracted Driving Policy

**8.4** Appendix D – Motor Vehicle Records Procedure

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B1, Tab 5, page 5, Updated

With respect to the Owen Sound Replacement project:

a) Please provide more details around the integrity issues from the Owen Sound Take-Off to the Waterloo Gate station.

b) How old is the pipe that is forecast to be replaced?

c) What is the net book value of the pipe that is forecast to be replaced? How will the remaining net book value of the pipe being replaced be treated for rate base purposes?

---

**Response:**

a) Since 2002, Union has an extensive pipeline maintenance and integrity management program in place that includes the regular monitoring of pipelines for corrosion, leaks or other potential damage to ensure its pipelines remain in safe operating condition.

As part of this program, Union regularly conducts in-line assessments of its pipelines using inline inspection tools called "pigs" to determine the condition of the pipelines. Based on the results of these assessments, Union takes appropriate mitigation action to address any integrity issues that are found.

The Owen Sound Line was initially inspected using inline inspection tools in 2003 and subsequently another inspection was completed in 2011. Investigative digs were also completed on the line subsequent to the inline inspection, and some of the more severe defects were removed from the line. While the inspection tools identified some of the defects in the line, such as denting and corrosion, other defects such as seam defects and stress corrosion cracking were also found, but these were more difficult to detect and quantify. Based on Union's experience with this line and given its overall condition and proximity to built-up areas, replacement of the line was deemed the most effective action to manage and ensure the long-term integrity of the line.

Please see the response at Exhibit J.B-1-1-2 for more detail on the Owen Sound Replacement Project.

b) Most of this pipe was installed in 1958. Since that time some short sections have been replaced.

c) The gross book value of the pipe being replaced with the Owen Sound Replacement Project is $1,721,056. The estimated net book value of the pipe at December 31, 2013 is $890,187. As Union uses group method accounting, accumulated depreciation is maintained for the entire group, not for an individual asset. Gains or losses are not recognized on retirement, they remain in the reserve. As the retirement resulting from this project is not significant relative to the gross book value of the entire group, the net book value of the line is not relevant. The following entry will be processed upon retirement:

| | | |
|---|---|---|
| DR | Accumulated Depreciation | $1,721,056 |
| CR | Transmission Mains | $1,721,056 |

There will be no impact on rate base.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B1, Tab 5, pages 5-7, Updated

a) If the Bristol 3330 remote terminal units became obsolete in 2009, why is Union only replacing them in 2012 and 2013?

b) Please describe the integrity issues associated with the Leamington Line Replacement. In particular, when were these issues first identified?

c) Please explain the need for the Bright A Silencer Relocation project.

d) Please provide the amounts associated with the depth of cover survey to lower or replace sections of the NPS 26 Dawn-Parkway pipeline in each of 2007 through 2011.

---

**Response:**

a) Although these units became technically obsolete in 2009, Union did not foresee any operating issues until 2012 and has developed a multi-year plan to replace them. The removed units will be used for spare parts, as remaining units are changed out.

b) The integrity issues associated with the Leamington Line are related to corrosion and compression fittings. These issues were identified in 2005. Union developed a multi-year plan to replace the line starting in 2006 with completion scheduled by the end of 2013.

c) The positioning of the current silencer is susceptible to creating an unsafe condition during compressor operation in an emergency situation, requiring gas evacuation of the station. This relocation project will eliminate that condition.

d) The annual cost to lower or replace sections of the NPS 26 Dawn-Parkway pipeline are included in the chart below:

| Year | Capital Spent for Lowering ($000's) |
|---|---|
| 2007 | 221 |
| 2008 | 0 |
| 2009 | 393 |
| 2010 | 78 |
| 2011 | 0 |

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B1, Tab 9

a) What amount has been included in the 2013 test tear rate base associated with the Parkway West project. Please show the derivation of this amount based on the average of monthly averages approach.

b) Please show the allocation of the rate base associated with the Parkway West project expenditures by rate class. Please explain any amounts allocated to in-franchise rate classes.

c) Please explain when each of the capital expenditures shown on page 5 would be closed to rate base.

---

**Response:**

a) – c) Please see the response at Exhibit J.B-1-1-2 a).

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B 1, Tab 2, Page 4 &
Exhibit B 1, Tab 4, Page 2 &
Exhibit B 1, Summary, Schedule 2, Line 62

a) For Distribution New Business ($48.6m 2013) please provide the total annual Capital Cost and average Capital Cost per customer addition for 2007-2013. Provide explanatory notes.

b) For Distribution ($155m 2013) and Transmission ($114.1m 2013) Capital projects indicate which projects are a) new (and $ amount) and b) which are deferred due to IRM (and $ amount).

---

**Response:**

a) Please see the response at Exhibit J.B-1-2-3 b).

b) All projects in Distribution and Transmission are new and none were deferred due to the IRM.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Tab 3, Pages 1

Union will no longer offer the Market Charge option as a means of financing community expansion projects. The reason for this change is that on average, customer additions for these projects have been lower than forecast. This is the case despite the fact forecast attachments are based primarily on customer survey responses obtained prior to construction. As a result, Union has not been able to recover the full amount of the Market Charge.

a) Show where this change is reflected in the Distribution New Business Guidelines B1, Tab 3, Appendix A.

b) How will this affect the 2013 attachments for a) new homes b) conversions compared to prior years?

c) Also identify the change in the DNB guidelines related to the residential service lateral lengths and costs.

d) Is Union seeking approval of the (revised) DNB guidelines? If so, please identify where in the evidence that is requested.

---

**Response:**

a) Please see Attachment 1 for a blackline version of the Distribution New Business Guidelines filed in this proceeding compared to the guidelines filed in EB-2005-0520.

b) The elimination of the Market Charge will have negligible impact on new homes or conversions attached compared to prior years. No community expansions have occurred in the last decade where a Market Charge was required. Union continues to provide a financing option for Aid-to-Construct charges, which provides an adequate alternative to the Market Charge.

c) In comparison to the New Business Guidelines filed in EB-2005-0520, the changes include:
- An increase in service lateral length provided at Union's cost from 20 metres to 30 metres for residential services; and,
- An increase in the excess footage charge from $30/metre to $45/metre for residential services that are over the 30 metre length noted above.

d) Union is not seeking approval for the revised New Business Guidelines. As with prior revisions, Union has informed the Board of any changes to the guidelines. The guidelines, which deal with a variety of system expansion-related matters, are reviewed and updated periodically to ensure they adequately address changing business circumstances and provide clear direction to employees engaged in attaching new customers to the distribution system.

# DISTRIBUTION NEW BUSINESS GUIDELINES

## I. PURPOSE

- To ensure that customers are treated fairly and consistently.
- To manage growth of the natural gas distribution business by providing guidelines for capital investment to ensure no undue rate impact for existing customers.
- To provide business principles and guidelines for distribution new business investments.
- To streamline administrative processes and approvals where possible.
- To delegate authority where appropriate to field operations staff.

## II. DEFINITIONS

**Distribution New Business -** is defined as providing gas service to new customers in all market segments (i.e. new and existing housing, commercial and industrial) who do not currently have access to natural gas. It also includes providing incremental gas supply capacity to existing customers.

**Distribution Project Portfolio** - An accumulation of all the new business capital requisitions that are issued and approved in the current month. It includes all future customer attachments, revenues and costs on the basis of the life cycle of each project. It excludes those customers requiring only a service lateral from an existing main.

**Rolling Project Portfolio** – An accumulation of the new business capital requisitions from the past 12-months Distribution Project Portfolio. The rolling Profitability Index (P.I.) is the cumulative P.I. data from the Rolling Project portfolio.

**Investment Portfolio**- The costs and revenues associated with all new distribution customers who are forecast to attach in a particular test year (including new customers attaching on existing mains). The Investment Portfolio includes a forecast of normalized reinforcement costs.

**Major Projects -** All new business projects with capital costs greater than $500,000.

**Service Lateral -** A gas pipeline connecting the company gas main to the customer's gas meter as measured from property line to meter.

**Minimum Size**: The minimum pipeline design size required to supply gas to the affected customers without consideration of potential customer demand downstream from this customer.

## III. ACCOUNTABILITY

The Company manages separate corporate distribution portfolios for the Northern ~~and Eastern~~ Operations area and the Southern Operations area. The rolling portfolio P.I. for each area must remain above 1.0 and the Net Present Value (NPV) must remain greater than 0 at all times.

The Director, ~~Channel Management~~ Distribution Marketing is accountable for ensuring that the corporate rolling P.I. exceeds 1.0 on an ongoing basis.

Each district is accountable for ensuring that they maintain a district rolling P.I. at or greater than a specified threshold. As a general rule the threshold is a P.I. of 1.0. However, at the discretion of the company, a district threshold may be set higher or lower for specified periods to balance the needs of customers and maintain the rolling P.I. for each operations area in excess of 1.0.

## IV. PROJECT ACCEPTANCE LEVELS

The minimum qualifying project P.I. shall be .80 including any customer contributions. The company will manage the Investment Portfolio ensuring that the portfolio P.I. remains above 1.0 and the rate impact is acceptable.

Requests for exceptions to the minimum P.I. must be authorized by the Director, ~~Channel Management~~ Distribution Marketing and the ~~District Operations Manager.~~Director, Distribution Operations.

A P.I. of 1.0 is required in situations where there is no further growth anticipated in the surrounding area and /or a dedicated line is required (i.e. a large industrial customer or a customer requiring only a service). Where the cost of proposed projects exceeds the capital available in a particular year, Union will proceed with the most profitable projects.

## V. COLLECTING A CONTRIBUTION

Projects that do not meet the minimum stage 1 economic criteria shall require that a contribution be collected from the customer(s).

The Company uses ~~2 methods of collection: Aid to Construct and Market Charge (MC).~~ An Aid to Construct method to collect these contributions. This can be defined as a

~~1.~~ **~~Aid to Construct~~** ~~-~~ ~~A~~ charge collected in advance of construction from new customers who have agreed to fund the shortfall in the economics.

~~a) For all projects where the administration of the market charge mechanism is not practical (i.e. due to low numbers of customers involved), an aid to construct will be collected to improve the economics of the project to an acceptable level.~~

~~b)~~a) The amount of aid to construct charged to the customer(s) will be based on the minimum size facilities to service that customer(s).

~~c)~~b) The customer(s) will have the option of paying the aid to construct upfront as a lump sum or have the amount financed at the company's finance rate.

~~2. **Market Charge (MC)** A fixed lump sum charge to be collected from each customer who connects to the specified pipeline project within a predetermined time period. The charge does not have a declining balance over time. Customers who connect in later years pay the same charge as customers who connect in earlier years.~~

~~a) This is an upfront charge, however, customers will be provided the option to finance it over time at the Company's current financing rate.~~

~~b) The capital required for the project shall go into rate base when the project goes into service. The rate base amount shall be net of the NPV of the market charge. The NPV amount required to bring a project up to a profitability index of at least .80 shall be funded by the Company as an unregulated accounts receivable. The Company shall enter into financial contracts with customers to collect the accounts receivable.~~

~~c) GST will be added to the customer contribution.~~

~~d) The MC amount for larger volume customers will be calculated in proportion to their coincident peak day demand, but in no case shall it be less than the residential fee. The application of this principle shall be as follows:~~

~~The amount shall be determined by comparing the costs of providing the additional peak day capacity for the larger volume customers in relationship to revenues provided by these customers. Where the revenues exceed the costs, the charge shall be equal to the residential charge. Where the costs exceed the revenues, the additional charge shall be applied pro-rata to each large volume customer.~~

~~e) If the customer has chosen to finance the MC over time, and the customer moves or sells their property, the balance of the MC is due unless the buyer signs an agreement assuming the financial obligation for the remaining payments.~~

~~f) The customer contribution principle will be explained to potential customers as part of the survey used to evaluate the market potential for the project.~~

~~g) Customers who do not make full payment on their gas bill will have any partial payment received applied first to the market charge and the balance of the payment will be applied in accordance with operating practice of the customer billing system.~~

## VI. PROJECT COSTS

a) When available, economic feasibility analysis shall use project specific data (costs, volumes, customer attachments) based on survey data, historical practice, weather and local conditions to determine the costs, load and forecast.

b) When no specific data is available or the project is a minor project, district averages shall be used.

## VII. SERVICE LATERALS

a) ~~To the extent that a customer's service lateral does not return a P.I. of 1.0 the customer shall be required to contribute an aid.~~ The company shall provide at its cost up to ~~20~~30 metres of service line to connect a residential customer.

~~a)~~b) Services over ~~20~~ the length specified above ~~metres~~ shall require the prior agreement of the customer to pay an "excess charge" of ~~$30.00~~ 45.00 per metre. This charge reflects a company-wide average of summer versus winter pricing, open versus built up conditions and company versus contractor crew pricing. In all cases the customer/builder shall be advised in advance of this charge.

~~b)~~c) The P.I. analysis for non-residential services shall be individually calculated reflecting the site specific lateral length, pipeline sizing, costs, gas usage and margins. Non-residential customers shall be required to contribute Aidto Construct if necessary to achieve a minimum P.I. of 1.0.

~~c)~~d) The service lateral is measured from property line to meter.

~~d)~~e) The minimum ~~initial gas load~~ requirement to qualify for residential service shall be ~~any combination of applications consuming at least 1,000 cubic metres per annum.~~ attachment of a water heater or a primary heat source. Requests for service without meeting this condition ~~less than 1,000 cubic metres per annum~~ shall be considered but will require a discounted cash flow analysis with estimated costs to be completed and any required customer contribution to be made in advance.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Tab 3, Table 1

a) Update B1, Tab3, Table 1- Ontario Housing Starts for 2011 Actuals and Forecast 2012 and 2013.

b) Please provide the 2012 and 2013 data for Union's franchise for each of the rate zones.

---

**Response:**

a) Please see the response at Exhibit J.O-2-2-5a) for an updated consensus forecast.

b) The data in Table 1 at Exhibit B1, Tab 3 provides Ontario-wide forecast information. The forecasters do not provide their forecast in rate zones for the Ontario utilities.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Tab 3, Appendix B

a) Please provide the total Sensitivity of 2013 RR to change in 1000 residential and 10 commercial customer additions.

b) Identify Capital (return) and Revenue components separately.

---

**Response:**

a) Assuming the additions and spending are spread evenly throughout the year the revenue requirement would increase by approximately $181,000. The deficiency impact is a decrease of approximately $45,000.

b) The revenue requirement consists of the following components:

| | |
|---|---|
| Return on assets | $ 85,000 |
| Income tax | 15,000 |
| O&M, depreciation | 81,000 |
| | $181,000 |

The associated revenue with these customers would be approximately $226,000.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Tab 5, Page 4 &
Exhibit B1, Summary Schedule

a) For the listed Transmission Projects please identify key dates/timing-LTC application approval, in-service etc.

b) How much is the 2013 rate base increase attributable to the listed projects?

---

**Response:**
a)

| Line No. | Projects ($ millions) | LTC Application Submission Date | In-Service | 2012 | 2013 |
|---|---|---|---|---|---|
| 1 | Parkway West – Land Purchase | Not Required | 1-Nov-14 | | 20.0 |
| 2 | Parkway West – Headers & Metering | 01-Nov-2012 | 1-Nov-14 | | |
| 3 | Owen Sound Replacement | 01-Oct-2012 | 1-Dec-13 | 1.2 | 17.9 |
| 4 | Integrity Management Program | Not Required | Ongoing | 7.0 | 5.3 |
| 5 | Bristol 3330 Replacement Program | Not Required | Ongoing | 1.4 | 1.7 |
| 6 | Leamington Line Replacement Ph 3b | Not Required | 31-Oct-12 | 1.2 | - |
| 7 | Leamington Line Replacement | Not Required | 1-Sep-13 | - | 1.4 |
| 8 | Bright A Silencer Relocation | Not Required | 1-Sep-13 | - | 1.1 |
| 9 | Odourant / Containment | Not Required | Ongoing | 0.6 | 1.1 |
| 10 | Depth of Cover Survey | Not Required | Ongoing | 1.0 | 1.0 |
| 11 | Marcellus-Kirkwall Station Modification | Not Required | 1-Nov-12 | 4.7 | - |
| 12 | Parkway TCPL Measurement Upgrade | Not Required | 1-Nov-13 | | 6.7 |
| 13 | Dawn-Parkway System Replacements - Phase II | Not Required | 10-Sep-12 | 6.2 | - |
| 14 | Bright A Pulsation Mitigation | Not Required | 1-Oct-12 | 2.0 | - |
| 15 | Lobo A/B | Not Required | 1-Dec-11 | 1.2 | - |
| 16 | Other | Not Required | Various | -<br>(0.2) | 4.6 |
| 17 | Total Transmission Projects | | | 48.0 | 114.1 |

b) A total of $63,387,000 of the increase in rate base is attributable to transmission projects listed in a) above.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Tab 6, Table 2

Please provide the IMP 10 year Plan capital expenditure forecast from 2012-2021.

---

**Response:**

The expenditures for each of the AIM Programs for 2012 and 2013 are summarized under Exhibit B1, Tab 6, Tables 3 to 7. The plan beyond 2013 is still being developed.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Summary, Schedule 2, Page 7, Line 158

A business case that identifies the cost and benefits of the request is jointly prepared by the business sponsor and IT. The level of detail of the business case and the number of times it is reviewed to ensure alignment to business value depends on the size and complexity of the request.

a) Please provide the Business Case and Project Justification, Cost Breakdown and Multi-Year Budget(s) for Union Line Modernization.

b) Explain why this Project cannot be rescheduled for Completion in 2015.

---

**Response:**

a) A formal written business case is not required as this is a Life Cycle project. The justification for the project follows.

Union's IT department determines when applications reach the end of their life. Applications are replaced if there are concerns about their ability to perform reliably, are not compliant with vendor contracts, are a burden from a support and maintenance perspective, and/or they are no longer able to be modified to incorporate business related and regulatory required enhancements.

As discussed at Exhibit B1, Tab 7, Page 3, the applications that exist within the Unionline environment are Unionline, CARE and Contrax. These key core customer interfacing systems are 15 years old and are reaching the end of their lives. Unionline is the web application which enables communication with external contract size natural gas customers. It is used for nominating and reporting. CARE is the application that manages customer's contractual rights on Union's system, nominations, allocations, confirmations, and reconciliations. Contrax administers the various natural gas contracts for S&T, direct purchase and sales services supplied by Union. On a monthly basis, this application calculates the cost of providing these services and generates an invoice.

b) Given the age of the applications, delaying modernization of the Unionline environment (Unionline, CARE and Contrax) would put their reliability and availability at risk. Union could reach a point where the applications simply do not perform the functions they were intended to perform or they can no longer be modified to reflect business related and

regulatory required enhancements. Delays also create greater support and maintenance burdens.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B, Tab 2, page 2

The evidence states that Union does not have a detailed 2007 Board approved budget. Please file the applied for capital budget in EB-2005-0520 and the actual spending for the years 2007-2011 in the same format. Please provide the forecast capital budgets for 2012 and 2013 in the same format.

---

**Response:**

Please see the response at Exhibit J.B-1-2-2.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B

Please explain the process Union used over the course of the IRM term to prioritize its capital projects. Please explain to what extent that process changed in the preparing the 2013 capital budget.

---

**Response:**

The Capital Budget process Union follows is described at Exhibit A2 Tab 3, Schedule 1. This process was used during the IRM period and did not change in the preparation of the 2013 capital budget.

Management identifies projects in three separate categories: Expansion projects, Maintenance projects and Information Technology.

Expansion projects are those required to meet customer's demands for additional service. Expansion projects account for $114 million (30%) of the $376 million in capital in 2013. Union evaluates all expansion projects for economic feasibility as described at Exhibit A2, Tab 3, Schedule 2.

Maintenance projects are those capital projects required to ensure compliance with codes and regulations and to meet contractual commitments. These include the costs to attach new customers within Union's franchise area, projects required to maintain safety and reliability and projects to replace existing facilities due to age, condition and obsolescence. These projects are identified based on assessment of risk as well as availability of resources to complete these projects. Maintenance projects account for $234 million (62%) of the $376 million in capital in 2013.

Information Technology (IT) projects are also identified to ensure compliance with regulations, reliability and integrity of systems as well as considering the availability of resources to manage these projects. IT projects account for $28 million (7%) of the $376 million in capital in 2013.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B, Tab 2, Appendix A

Please explain any changes to Union's capitalization policy since 2007. What is the impact of those changes on the 2013 revenue requirement?

---

**Response:**

Please see the response at Exhibit J.O-7-1-1 a) and b).

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 3, page 2

Union has filed new "Distribution New Business Guidelines". Please specifically identify all the changes since 2007. Please provide the impact of all of those changes on the 2013 revenue requirement.

---

**Response:**

Please see the response at Exhibit J.B-1-3-2 a) for a blackline version showing all the changes to the guidelines. Union does not expect the changes to have a material impact on 2013 revenue requirement.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 3, page 2

Union is no longer offering the Market Charge option as a means of financing community expansion projects. What are the implications of eliminating this option?

---

**Response:**

Please see the response at Exhibit J.B-1-3-2 b).

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 3, Appendix B

Please provide Union's Customer Attachment Forecast and actual number of attachments for each year 2007-2013.

---

**Response:**

Please see line 15 of Exhibit B1, Tab 3, Appendix B, Updated.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 4, page 5

With respect to the Thunder Bay Project, when is it expected to be in service? What factors could delay the in-service date? Please provide a detailed total budget for the project. Please explain how the contribution in aid of construction was determined.

---

**Response:**

a) Please see the response at Exhibit J.B-1-2-3 c).

b) Factors that could delay the in-service date are varied and could include, but not be limited to, construction problems driven by weather, land acquisitions delays and 3rd party intervention.

c) Please see the response at Exhibit J.B-1-7-19 a) i).

d) The contribution for aid to construction was calculated in a manner consistent with EBO 188.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 4, page 5

With respect to the Red Lake Project what is the expected in-service date? The evidence indicates that the project is dependent upon funding from both the Provincial and Federal Governments. Please provide the current status of the project and indicate what factors could delay the in-service date.

---

**Response:**

Please see the response at Exhibit J.B-1-1-1.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 4, page 6

What is the expected in-service date for the Lambton Power Plant project? What factors might delay the in-service date?

---

**Response:**

a) Lambton Generating Station is forecast to be in-service on November 1, 2014 subject to issuance of the Ministerial Directive to proceed.

b) The primary factor that could delay the Lambton Generating Station is the timing of the Ministerial Directive.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 4, page 6

With respect to the Guelph Plant what is the expected in-service date? What factors could delay the in-service date?

---

**Response:**

Please see the response at Exhibit J.B-1-2-3 f). The project is still in the formative stages with an expected in-service date of 2013.

Union and the customer have not finalized the contract.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 4, page 7

Union's budget for field-based facilities is $13.6 million in 2013 and $14 million in 2012. Please provide a detailed budget for this budget item and business cases for the proposed expenditures.

---

**Response:**

| Facility ($ Millions) | 2012 Budget | 2013 Budget |
|---|---|---|
| Waterloo Branch Renovation | 2.3 | 0 |
| Hamilton Branch and Training Centre Build | 11.7 | 13.6 |
| Total | 14.0 | 13.6 |

Please see the CB Richard Ellis Study filed at Exhibit J.B-1-5-13.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 4, page 8

Please provide a schedule setting out all of the field-based facilities work planned for 2012 and 2013. Please include the Chatham Corporate Office Project, the Hamilton District Building, and the Waterloo Building. For each project included as field-based facilities please provide a complete project budget, including spending in each year, and a business case, justifying the expenditures.

---

**Response:**

I/ Hamilton Branch Office and Training Centre – new building to replace the current Hamilton facility and the Training and Education Centre.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2010 | $2.8 million (Land Purchase) |
| 2 | 2011 | $2.5 million (Engineering) |
| 3 | 2012 | $11.7 million (Engineering & Construction) |
| 4 | 2013 | $13.6 million (Construction & Move-in) |

II/ Waterloo Branch Office Renovation – renovate existing building to a LEED standard.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2011 | $4.8 million (Engineering) |
| 2 | 2012 | $2.3 million (Construction & Move-in) |

III/ Chatham Corporate Office Renovation - Ground floor tower renovation to add meeting and training rooms.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2011 | $2.7 Million* (Engineering) |
| 2 | 2012 | $1.5 Million (Construction) |
| 3 | 2013 | (Construction & Move-in) |

*In the original forecast, Union planned to spend $2.7 Million in 2011 to complete a significant portion of this project. Delays in securing a temporary location for affected employees pushed the project timelines back by several months, resulting in an actual spend of $0.183 million in 2011. Capital costs to complete this project will be deferred into 2012 and 2013. The project budget is still $4.2 million.

The CB Richard Ellis study filed at Exhibit J.B-1-5-13 provides the justification for these projects.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 4, page 7

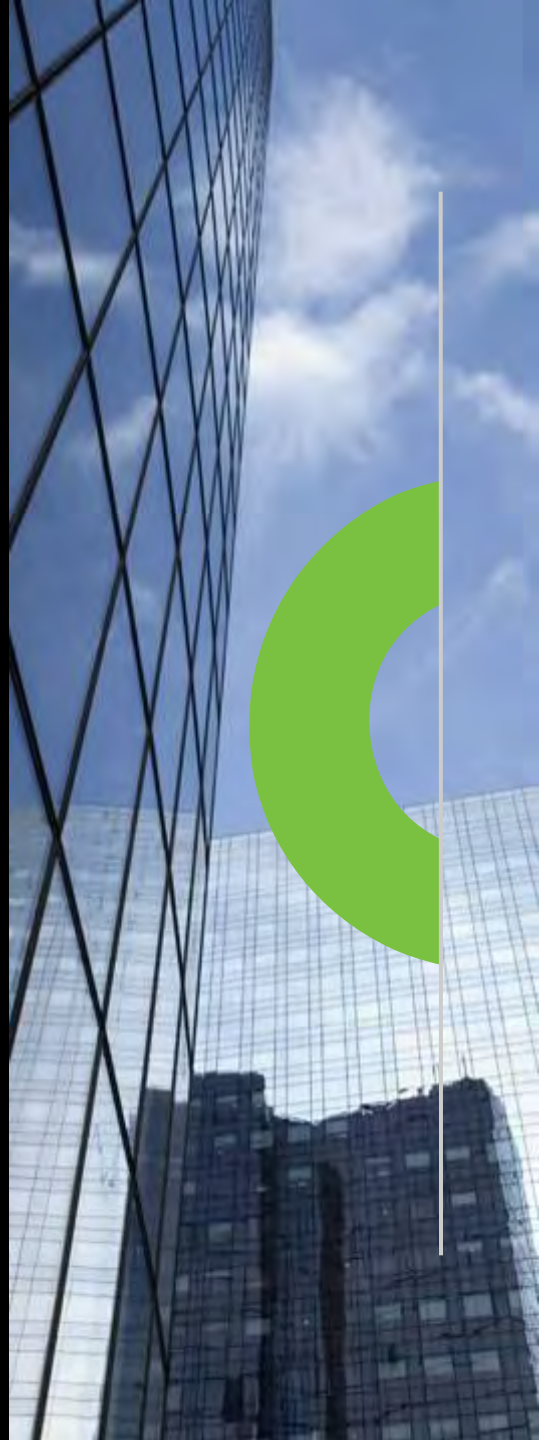
Please provide a copy of the CB Richard Ellis Study.

---

**Response:**

Please see Attachment 1.

Filed: 2012-05-04
EB-2011-0210
J.B-1-5-13
Attachment 1



# Union Gas Real Estate Strategy

ULG Presentation
February 4, 2010

CBRE
CB RICHARD ELLIS

# Agenda

1. Executive Summary
2. Real Estate Strategy Opportunity Statement
3. Real Estate Options:
   - Costs and Benefits
   - Alternative Work Place Strategies
   - Summary of Options
4. Background items:
   - Capital Requirements
   - Benchmarking – Space Allocation
   - Key Issues - Recruitment
5. Summary of Issues for Executive Consideration

Appendices

# Executive Summary

## Presentation Objective:

- To present the results of the Real Estate Study;
- To request endorsement for the Portfolio Wide Base Case capital budget of $71.8 M over six years (subject to annual capital planning process); and
- Further direction on preferred real estate option and work place strategy, with appropriate budget (including possible Chatham Corporate re-stacking).

## Presentation Summary:

- This presentation describes five options with costs and benefits; and
- The following background issues are highlighted for discussion:
  - Historic, approved and forecasted capital spend;
  - Space allocation benchmarks; and
  - Recruitment challenges associated with Chatham.

# Real Estate Strategy Opportunity Statement

The corporate office for Union Gas is, and will remain, in Chatham.

Capital investment is required in Chatham, London, Hamilton and Waterloo.

The opportunity exists to optimize the portfolio and capital spend to support:

| Objectives | Potential Actions |
| --- | --- |
| ▪Employer of choice | ▪Address over-crowding at Chatham Corporate<br>▪Provide suitable and flexible space<br>▪Recruit employees from a larger talent pool |
| ▪Work force of choice, choice of workplace – future business needs | ▪Virtual teams /distributed work, mobile workforce |
| ▪Improved utilization of real estate | ▪Shift selected functions to London, Waterloo and Hamilton |

# Options: Costs and Benefits

| | Base Case for In-Scope Buildings - Current State | Option 1: Expand and Consolidate Chatham Corp. | Option 2: Commuter Mobility | Option 3: Commuter Mobility Migration to London | Option 4: Optimize London, Waterloo and Hamilton | Option 5: Add New Chatham Space, Mobility Solutions |
|---|---|---|---|---|---|---|
| Base Building London, Waterloo, Other | $28.4 M | $28.4 M | $28.4 M | $28.4 M | $28.4 M | $28.4 M |
| Hamilton New Build | $13.6 M | $13.6 M | $13.6 M | $13.6 M | $17.9 M | $17.9 M |
| Base Building Chatham Corporate | $23 M | $42.4 M | $23 M | $23 M | $23 M | $34.5 M (additional site) |
| Chatham Corporate Office Interiors | N/A | $9.2 M | $9.2 M | $9.2 M | $9.2 M | $9.2 M |
| Total | $ 65 M | $ 93.6 M | $ 74.2 M | $ 74.2 M | $ 78.5 M | $ 90 M |
| Happiness Index (Impact on Staff) | No change | ↑↑↑ | ↑↑ | ↑↑ | ↑↓↓ | ↑↑ |
| Addresses Workforce of the Future? | No | No | No | Yes | Yes | Partial |
| Optimized Portfolio? | No | No | Partial | Partial | Yes | Partial |
| Address Overcrowding at Chatham Corporate? | No | •New office interiors – refreshed and more open<br>•Improve teaming and collaboration – more meeting rooms<br>•Improve layouts and workflows – contiguous space for teams<br>•Reinforce “employer of choice” | | | | |

# Options: Alternative Work Place Scenarios

Happening today:

- **Informal Mobility:**
- 8% of HO staff commute

- **Distributed Work Arrangements:**
  - Virtual teaming
  - Project work

- **"Telecommuting" Pilot (Spectra Energy initiative)**

Potential Future Alternative Work Place Programs:

- **Commuter Mobility Program (Option 2):**
  - Employees who commute in from surrounding communities

- **Formalize Distributed Work Models (Options 3,4):**
  - Develop guidelines
  - Provide support

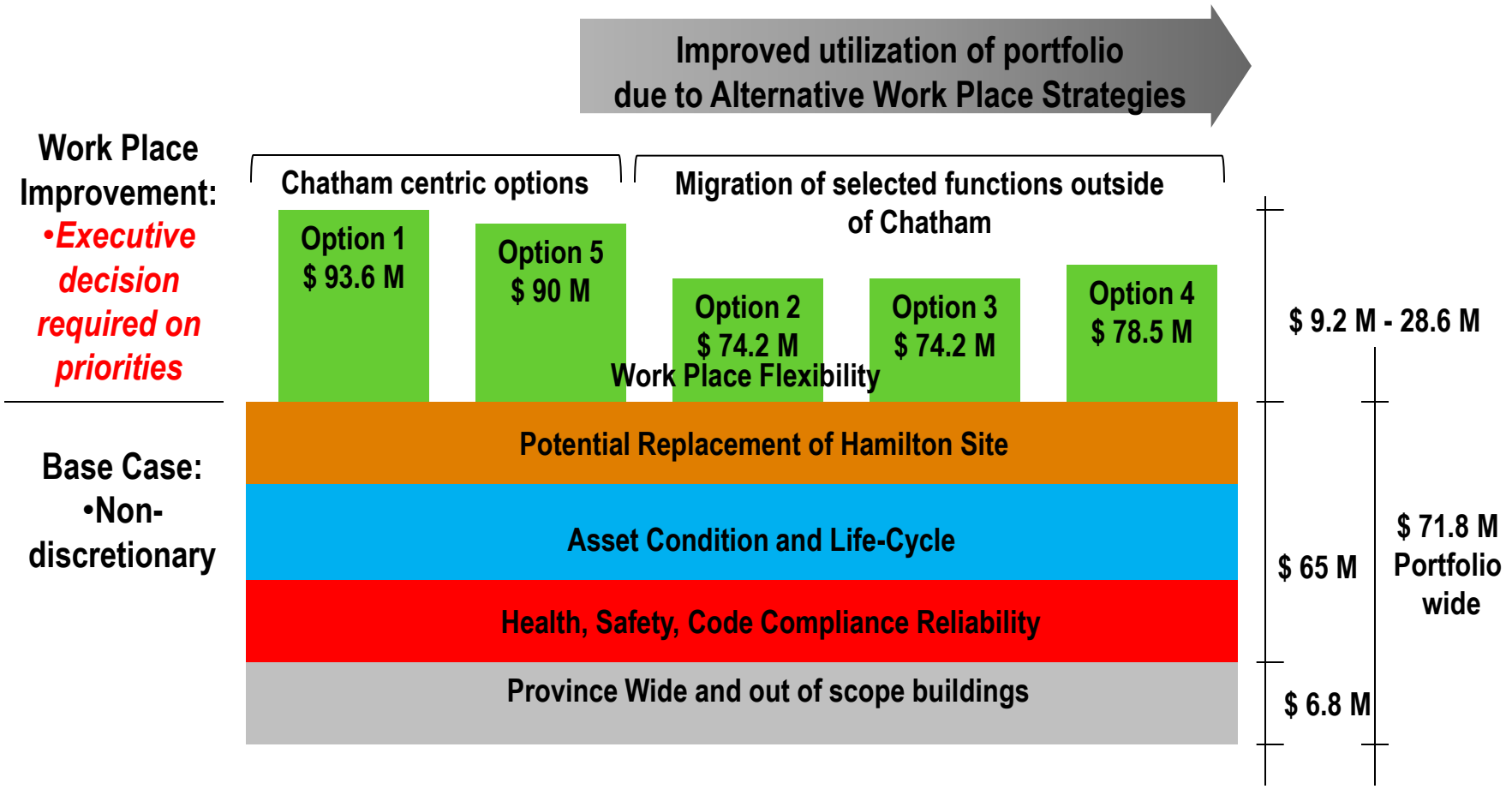
- **Establish London as a secondary office satellite location (Option 3):**
  - Develop a nucleus
  - Natural migration

- **Move Selected Groups to London/ Hamilton / Waterloo (Option 4)**

Disruptive Impact Increases

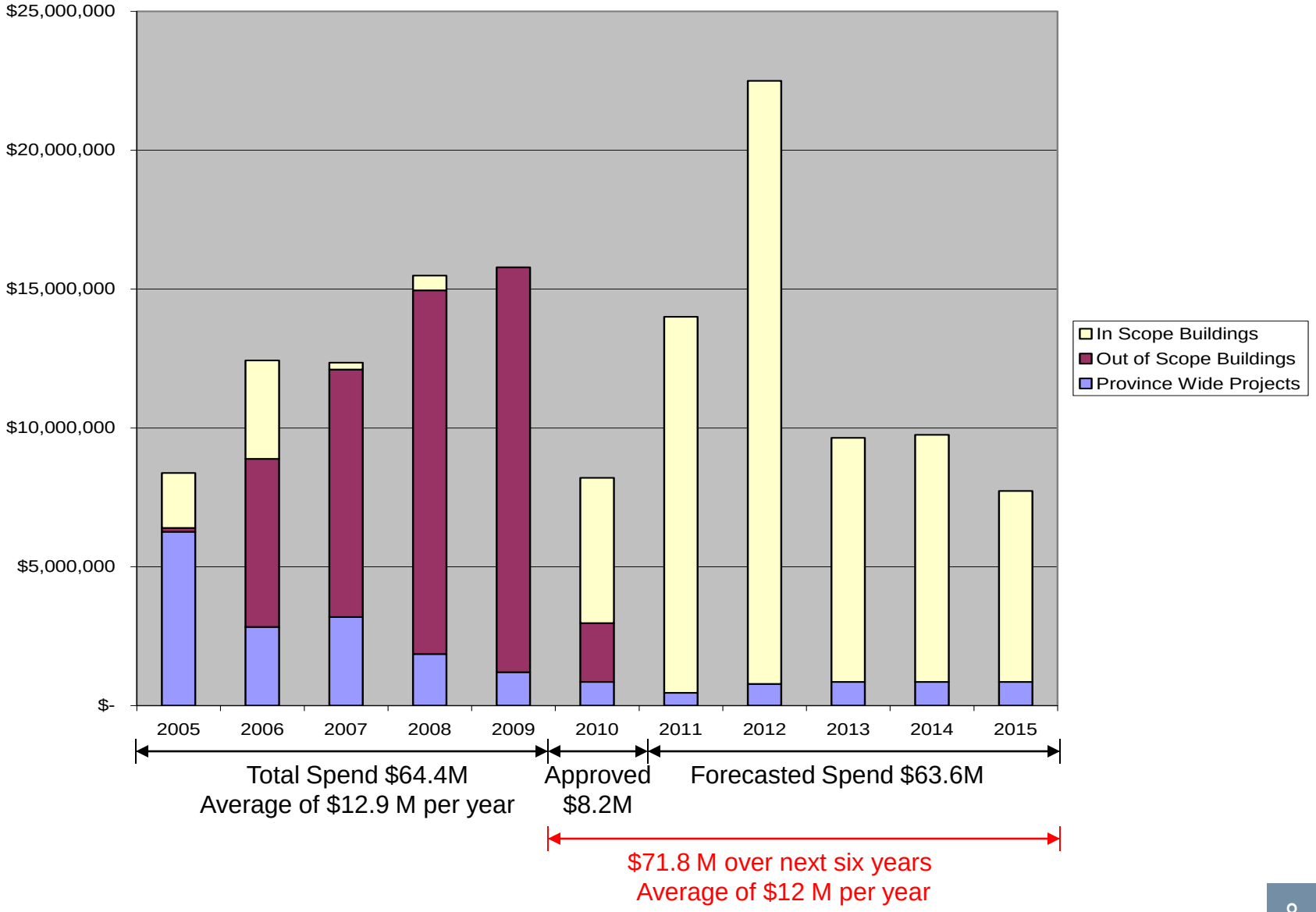
***Executive decisions will be needed on willingness to adopt potential programs, given potential impacts***

# Summary of Options

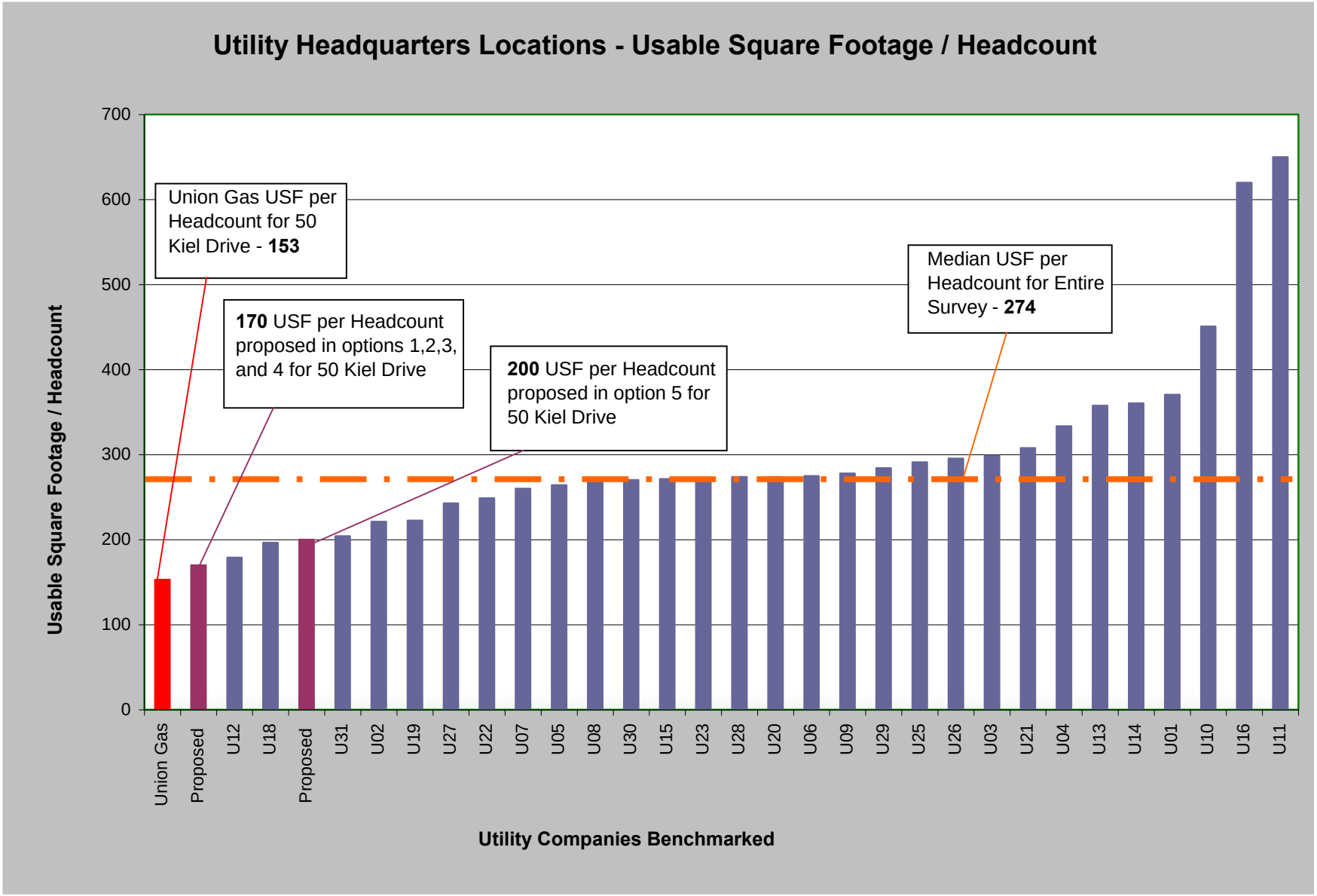


# Historical, Approved and Forecasted Capital

**The base case spending comprised of approved and forecasted capital over next six years totals $71.8 M**



# Benchmarking: Space Allocation




- Union Gas's Headquarters space utilization metric is significantly lower then industry comparables.
- Source data for above metrics is the IFMA Utilities Council Benchmarking Report (July 2005).

# Key Issues: Recruitment

- Union Gas is very successful at attracting and hiring graduates who are from the Windsor/Chatham/Sarnia/London area;
- Union Gas is positioned to be an Employer of Choice at the University of Windsor and The University of Western Ontario;
- Union Gas is less successful at attracting targeted students to apply from other in-franchise universities;
- Union Gas has over a 50% decline-of-offer rate from graduates who a) reside and/or b) attend universities outside of the Windsor to London area;
- Location (Chatham) is a primary reason for graduates to decline offers. However, Union Gas appears to be competitive on other employment variables (compensation, benefits, nature of work, career opportunities, etc)

# Issues for Executive Consideration

Issues:

- Consensus on:
  - The facilities are “tired” and need investment
  - Need to address “over-crowding” at Chatham Corporate
- Discussion needed on:
  - How important is it to offer choice of location to employees?
  - Formal adoption of an Alternative Work Place Strategy?

Decisions needed:

- Approve life-cycle capital plan ($71.8 M – 6 years, subject to annual capital process)
- $9.2 M for Chatham Corporate re-stacking (cost subject to validation)
- Which long term real estate strategy is best?
  - Chatham “centric” options (1 or 5)
  - Options using Alternative Work Place Solutions (2, 3, or 4)
- Set up Alternative Work Place Team for further study
  - HR, IT and Facilities

*Project Team Recommendation:*
*Options 3 / 4 meet all three project objectives*

# Appendices:

A: Portfolio Analysis

B: Space Usage Benchmarks

C: Potential Headcount Shift

D: Space Standard – Sensitivity Modelling

E: Commuter Numbers

F: Capital Budgets - Additional Detail

G: Virtual Teams - Technology

H: Summary of Manager Survey and Change Management Recommendations for Adoption of Alternate Work Place Solutions

I: Key Findings – Campus Recruiting

Portfolio Analysis

# APPENDIX A

# Real Estate Portfolio Analysis

## Supply of Space

- Overcrowding at Chatham Corporate
- "Tired" space
- Underutilized district facilities

## Demand for Space

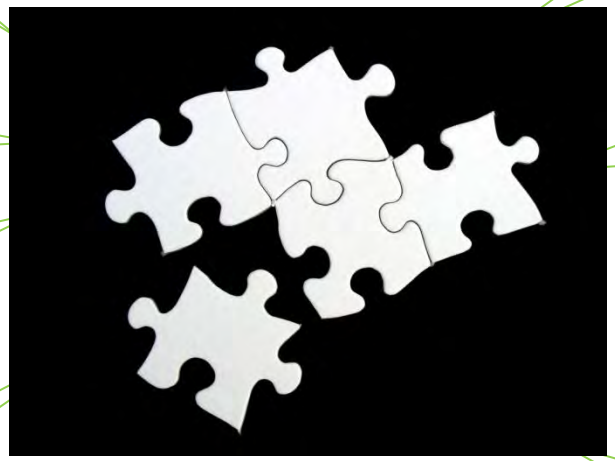
- Number and location of staff
- Type of job function
- Business unit needs and interactions

Suitability

Building Condition

Capital Requirements

Envelope Capacity



"Strive Higher"
- Suitable Work Environment
- Technology Support

Talent Management
- Recruitment
- Retention

Flexible / "On Demand" Space
- Collaboration
- Project Teams

Virtual / Distributed Teams

***Objective is to balance supply and demand for space***

# Assessment of Supply: Suitability

## Changes to the Portfolio:

- Replace Hamilton Strathearne Building
  - Lease versus own decision
  - Disposition is an issue
- 496 Riverview: renew or relocate to Ed Centre by January 2013
- Base building re-capitalization needed for Chatham Corporate, London and Waterloo
- Choices with respect to Chatham Corporate to address overcrowding
  - Space standard requires adjustment
  - Requires a fit-up expenditure
- May have to maintain HO function in other Chatham locations (depends on option selected)
- Impact Sarnia and Windsor sites

| Location | Suitability for Office Use | | |
|---|---|---|---|
| | Location | Base Building Suitability | Work Place Suitability |
| Chatham Corporate | Suitable | Recapitalization needed | Modification needed |
| Ed Centre | Suitable | Suitable | Suitable |
| 555 Riverview | Suitable | Suitable | Suitable |
| 750 Richmond (leased) | Suitable | Suitable | Suitable |
| 496 Riverview (leased) | Suitable | Unsuitable | Unsuitable |
| **Locations Within a One Hour Commute** | | | |
| London District Office | Suitable | Recapitalization needed | Modification needed |
| Locations Not Within Commute Distance | | | |
| Hamilton District Office | Unsuitable | Unsuitable | Unsuitable |
| Waterloo District Office | Suitable | Recapitalization needed | Modification needed |

# Assessment of Supply: Capacity

Capacity:

- Space allocation at Chatham Corporate is below industry mean (see Appendix)
- Requires fit-up / re-stack expenditure to address a new space standard
- Four potential options have been developed to address this

| Location | Capacity | | | | | | |
|---|---|---|---|---|---|---|---|
| | Current | | | Capacity under new space standard (sq. ft. per person) | | | |
| | Capacity | Occupied | Percent under utilized | 170 | 200 | 225 | 250 |
| Chatham Corporate | 800 | 800 | 0 | 761 | 647 | 575 | 518 |
| Ed Centre | 51 | 41 | 20% | 51 | 41 | 37 | 33 |
| 555 Riverview | 57 | 48 | 16% | 56 | 56 | 56 | 56 |
| 750 Richmond (lease) | 52 | 44 | 15% | 50 | 48 | 42 | 38 |
| 496 Riverview (lease) | 17 | 15 | 12% | 17 | 17 | 15 | 13 |
| **Locations Within a One Hour Commute** | | | | | | | |
| London District Office* | 94 | 78 | 17% | 104** | 88 | 79 | 71 |
| Locations Not Within Commute Distance | | | | | | | |
| Hamilton District Office | 79 | 49 | 28% | 49 | 102 | 102 | 102 |
| Waterloo District Office | 58 | 52 | 10% | 75*** | 63 | 56 | 51 |

* Excludes Dave Craven's Group

** Area amenable to renovation only needs to accommodate 67 of the 78 staff

*** Area amenable to renovation only needs to accommodate 36 of the 52 staff

# Real Estate Scenarios

| | Base Case | Option 1:<br>Expand HO | Option 2:<br>Chatham HO Plus Chatham HO Satellite/s |
|---|---|---|---|
| **Chatham Corporate Office** | Base building life-cycle recapitalization | **Expand** and consolidate<br>Re-stack and retrofit | Re-stack and retrofit<br>Introduce **mobility programs** |
| **Ed Centre** | Base Building Upgrades | **Vacate** HO functions | Maintain occupancy |
| **555 Riverview** | Base Building Upgrades | | |
| **750 Richmond** | No change | | |
| **496 Riverview** | Replace - Ed Centre site | Replace - Ed Centre site | Replace - Ed Centre site |
| **London District Office** | Retrofit for current functions | Retrofit for current functions | Retrofit for current functions |
| **Hamilton District Office** | Replace - new build for existing functions | Replace - new build for existing functions | Replace - new build for existing functions |
| **Waterloo District Office** | Retrofit for current functions | Retrofit for current functions | Retrofit for current functions |
| | | | |
| **Advantages** | | Highest "happiness index"<br>Every-one co-located | Alleviate overcrowding at Chatham Corporate |
| **Disadvantages** | | Forecasting the future through the rear view mirror | Change management required for mobility solutions |

# Real Estate Scenarios

| | Option 3:<br>London Secondary Office Satellite | Option 4:<br>Maximize Waterloo and Hamilton | Option 5:<br>Acquire Additional Space in Chatham, Utilize London, Waterloo and Hamilton |
|---|---|---|---|
| **Chatham Corporate Office** | Re-stack and Retrofit<br>Introduce **mobility programs** | Re-stack and Retrofit<br>Introduce **mobility programs** | Re-stack and Retrofit<br>Introduce **mobility programs** |
| **Ed Centre** | Maintain occupancy | Maintain occupancy | Maintain occupancy |
| **555 Riverview** | | Maintain occupancy | Maintain occupancy |
| **750 Richmond** | | **Vacate** HO functions | **Vacate** HO functions |
| **496 Riverview** | Replace - Ed Centre site | Replace - Ed Centre site | Replace - Ed Centre site |
| **London District Office** | **Natural Migration** of Distributed Work Teams<br>Option 3A: **Move selected groups** | **Move selected groups** to London | **Move selected groups** to London |
| **Hamilton District Office** | Replace - new build for existing functions | **Potential to move selected groups** to Hamilton | **Potential to move selected groups** to Hamilton |
| **Waterloo District Office** | Retrofit for current functions | **Potential to move selected groups** to Waterloo | **Potential to move selected groups** to Waterloo |
| | | | |
| **Advantages** | Alleviate overcrowding at Chatham Corporate and optimizes London | Alleviate overcrowding at Chatham Corporate and optimizes London, Waterloo and Hamilton | Alleviate overcrowding at Chatham Corporate and optimizes London |
| **Disadvantages** | Potential significant impacts to groups who are moved | Potential significant impacts to groups who are moved | Potential significant impacts to groups who are moved |

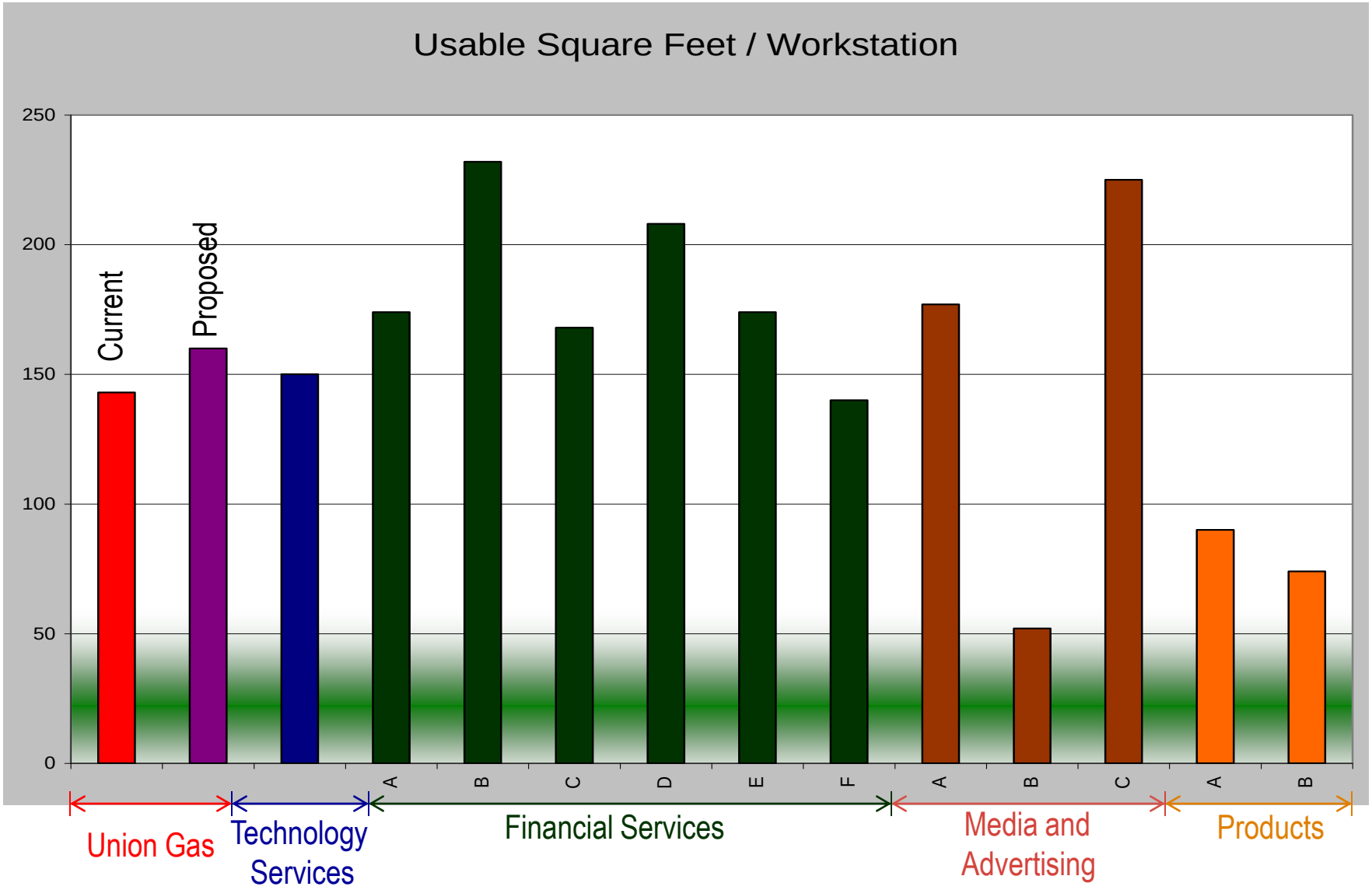
Space Usage Benchmarks

# APPENDIX B

# Current State Space Usage

| Building | Headcount | # of Workstations | Sp Ft Total Office usable | Sq Ft per Workstation | Sq Ft per workstation of Total Usable | Sq ft per Employee of Total Usable | Gross Construction | Sq Ft Rentable | Rentable per Employee | Sq Ft Gross Construction per Employee |
|---|---|---|---|---|---|---|---|---|---|---|
| **50 Keil** | 800 | 856 | 122,624 | 75 | 143 | 153 | 192,133 | 177,327 | 222 | 240 |
| **750 Richmond** | 44 | 55 | 9,518 | 82 | 173 | 216 | | 10,145 | 231 | 0 |
| **Ed Center** | 41 | 55 | 32,220 | 79 | 586 | 786 | 44,803 | 37,558 | 916 | 1,093 |
| **496 Riverview** | 15 | 19 | 6,964 | 121 | 367 | 464 | | 9,153 | 610 | 0 |
| **555 Riverview** | 48 | 61 | 19,418 | 89 | 318 | 405 | 55,802 | 54,438 | 1,134 | 1,163 |
| **London** | 169 | 146 | 31,253 | 101 | 214 | 185 | 57,781 | 55,701 | 330 | 342 |
| **Waterloo** | 52 | 61 | 24,298 | 101 | 398 | 467 | 38,662 | 37,054 | 713 | 743 |
| **Hamilton** | 49 | 79 | 23,981 | 104 | 304 | 489 | 54,084 | 51,970 | 1,061 | 1,104 |

# Benchmarking across other Industries



Potential Headcount Shifts

# APPENDIX C

# Potential Relocations

| | | | | | | |
|---|---|---|---|---|---|---|
| Vacancy Rate | 7% | 7% | 7% | 7% | 7% | 7% |
| SF per FTE * | 170 | 170 | 170 | 170 | 170 | 200 |
| | Current State | Expand & Consolidate | Commuter Mobility | Commuter Mobility + Natural Migration to London | Relocate CC, 555, 750 and EC to all other locations + Hamilton | Relocate CC and 750 using Mobility + Natural Migration to London and additional space to be acquired |
| | **Base Case** | **Option 1** | **Option 2** | **Option 3** | **Option 4** | **Option 5** |
| **Location** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Commuters < 30 min**** |
| 496 Riverview | 5 | | | | | | |
| Hamilton | (49) | (49) | (49) | (49) | (102) | **(102)** | |
| Chatham Corp | (39) | (39) | (39) | (39) | (39) | (153) | (76) |
| 555 Riverview | 8 | (36) | | | 8 | | |
| 750 Richmond | 5 | (44) | | | (44) | (44) | |
| Ed Center | 8 | (32) | | | 8 | | |
| London | 37 | | 17 | 37 | 37 | 21 | 17 |
| Waterloo | 39 | | | | 39 | | |
| Windsor | 12 | | 12 | 12 | 12 | 12 | 33 |
| Sarnia | 11 | | 11 | 11 | 11 | 11 | 19 |
| **TOTAL** | **81** | **(151)** | **1** | **21** | **32** | **(152)** | **(7)** |
| **Additional Lease Space required** | | | | | | **(35,012)** | |

Move out

Move in

New Build

**Notes**

** Base Case and Options 1 to 4 assumes 170 square foot standard per person and a vacancy rate of 7%. Option 5 assumes 200 square feet standard per person and a vacancy rate of 7%*

*** 76 commuters in total but 69 less than 30 minutes from London, Windsor or Sarnia*

*In Option 1 the Staff remaining at 555 Riverview after relocation = 12, staff remaining at Ed Center after relocation = 9*

*Option 4 and 5 include additional 53 spaces in Hamilton to accommodate potentail demand for COE*

Space Standard Sensitivity Modelling

# APPENDIX D

# Potential Relocations –200 sq ft pr person

| | |
|---|---|
| Vacancy Rate | 7% |
| SF per FTE | 200 |

| | Current State | Expand & Consolidate | Commuter Mobility | Commuter Mobility + Natural Migration to London | Relocate CC, 555, 750 and EC to all other locations + Hamilton | Relocate CC and 750 using Mobility + Natural Migration to London and additional space to be acquired | |
|---|---|---|---|---|---|---|---|
| | **Base Case** | **Option 1** | **Option 2** | **Option 3** | **Option 4** | **Option 5** | |
| **Location** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Opp to Increase (Reduce) HC** | **Commuters < 30 min**** |
| 496 Riverview | 2 | | | | | | |
| Hamilton | (49) | (49) | (49) | (49) | **(102)** | **(102)** | |
| Chatham Corp | (153) | (153) | (153) | (153) | (153) | (153) | (76) |
| 555 Riverview | 8 | (36) | 8 | 8 | 8 | | |
| 750 Richmond | 4 | (44) | 4 | 4 | 4 | (44) | |
| Ed Center | 0 | (32) | | | | | |
| London | 21 | | 17 | 21 | 21 | 21 | 17 |
| Waterloo | 27 | | | | 27 | | |
| Windsor | 12 | | 12 | 12 | 12 | 12 | 33 |
| Sarnia | 11 | | 11 | 11 | 11 | 11 | 19 |
| **TOTAL** | **(69)** | **(265)** | **(101)** | **(97)** | **(16)** | **(152)** | **(7)** |
| **Additional Lease Space required** | | | **(23,290)** | **(22,272)** | **(3,785)** | **(35,012)** | |

Move out

Move in

New Build

**Notes**

*All options including Base Case assumes 200 square foot standard per person and a vacancy rate of 7%*

**102 proposed for Hamilton include the 53 staff still displaced after relocation of staff to London, Waterloo, Windsor & Sarnia*

***76 commuters in total but 69 less than 30 minutes from London, Windsor or Sarnia*

*In option 1 the staff remaining at 555 Riverview after relocation = 12, and staff remaining at Ed Center afer relocation = 9*

*In option 5 the additional 53 spaces in Hamilton would not be use*

# Potential Relocations –225 sq ft pr person

| | |
|---|---|
| Vacancy Rate | 7% |
| SF per FTE | 225 |

| Location | Base Case<br>Current State<br>Opp to Increase (Reduce) HC | Option 1<br>Expand & Consolidate<br>Opp to Increase (Reduce) HC | Option 2<br>Commuter Mobility<br>Opp to Increase (Reduce) HC | Option 3<br>Commuter Mobility + Natural Migration to London<br>Opp to Increase (Reduce) HC | Option 4<br>Relocate CC, 555, 750 and EC to all other locations + Hamilton<br>Opp to Increase (Reduce) HC | Option 5<br>Relocate CC using Mobility + Natural Migration to London and additional space to be acquired<br>Opp to Increase (Reduce) HC | Commuters < 30 min** |
|---|---|---|---|---|---|---|---|
| 496 Riverview | (0) | | | | | | |
| Hamilton | (49) | (49) | (49) | (49) | **(102)** | **(102)** | |
| Chatham Corp | (225) | (225) | (225) | (225) | (225) | (225) | (76) |
| 555 Riverview | 8 | (36) | 8 | 8 | 8 | 8 | |
| 750 Richmond | (2) | (44) | (2) | (2) | (2) | (2) | |
| Ed Center | (4) | (32) | (4) | (4) | (4) | (4) | |
| London | 12 | | 17 | 12 | 12 | 12 | 17 |
| Waterloo | 20 | | | | 20 | | |
| Windsor | 12 | | 12 | 12 | 12 | 12 | 33 |
| Sarnia | 11 | | 11 | 11 | 11 | 11 | 19 |
| **TOTAL** | **64** | **(337)** | **(183)** | **(188)** | **(115)** | **(188)** | **(7)** |
| **Additional Lease Space required** | | | **(47,359)** | **(48,757)** | **(29,781)** | **(48,757)** | |

Move out
Move in
New Build

**Notes**

*All options including Base Case assumes 225 square foot standard per person and a vacancy rate of 7%*

***76 commuters in total but 69 less than 30 minutes from London, Windsor or Sarnia*

*In Option 1 the Staff remaining at 555 Riverview after relocation = 12, staff remaining at Ed Center after relocation = 9*

*In Option 4 the 102 proposed for Hamilton include the 53 staff still displaced after relocation of staff to London, Waterloo, Windsor & Sarnia*

*In option 5 the additional 53 spaces in Hamilton would not be use*

# Potential Relocations –250 sq ft pr person

| | |
|---|---|
| Vacancy Rate | 7% |
| SF per FTE | 250 |

| Location | Current State<br>Base Case<br>Opp to Increase (Reduce) HC | Expand & Consolidate<br>Option 1<br>Opp to Increase (Reduce) HC | Commuter Mobility<br>Option 2<br>Opp to Increase (Reduce) HC | Commuter Mobility + Natural Migration to London<br>Option 3<br>Opp to Increase (Reduce) HC | Relocate CC, 555, 750 and EC to all other locations + Hamilton<br>Option 4<br>Opp to Increase (Reduce) HC | Relocate CC using Mobility + Natural Migration to London and additional space to be acquired<br>Option 5<br>Opp to Increase (Reduce) HC | Commuters < 30 min** |
|---|---|---|---|---|---|---|---|
| 496 Riverview | (2) | | | | | | |
| Hamilton | (49) | (49) | (49) | (49) | **(102)** | **(102)** | |
| Chatham Corp | (282) | (282) | (282) | (282) | (282) | (282) | (76) |
| 555 Riverview | 8 | (36) | 8 | 8 | 8 | 8 | |
| 750 Richmond | (6) | (44) | (6) | (6) | (6) | (6) | |
| Ed Center | (8) | (32) | (8) | (8) | (8) | (8) | |
| London | 4 | | 4 | 4 | 4 | 4 | 17 |
| Waterloo | 15 | | | | 15 | | |
| Windsor | 12 | | 12 | 12 | 12 | 12 | 33 |
| Sarnia | 11 | | 11 | 11 | 11 | 11 | 19 |
| **TOTAL** | **(247)** | **(394)** | **(262)** | **(262)** | **(194)** | **(262)** | **(7)** |
| **Additional Lease Space required** | | | **(75,241)** | **(75,241)** | **(55,776)** | **(75,241)** | |

Move out

Move in

New Build

**Notes**

*All options including Base Case assumes 250 square foot standard per person and a vacancy rate of 7%*

***76 commuters in total but 69 less than 30 minutes from London, Windsor or Sarnia*

*In Option 1 the Staff remaining at 555 Riverview after relocation = 12, staff remaining at Ed Center after relocation = 9*

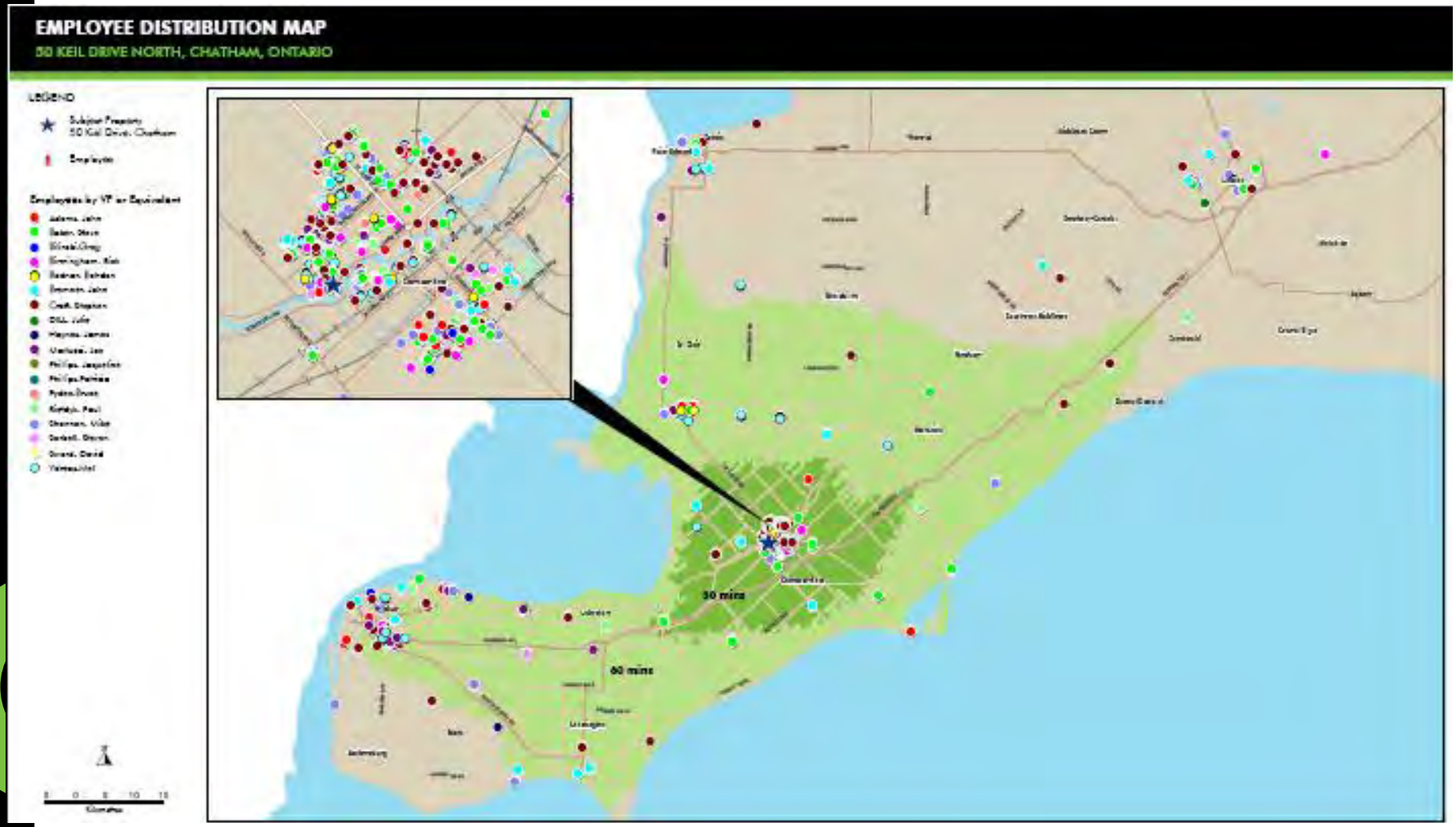
*In Option 4 the 102 proposed for Hamilton include the 53 staff still displaced after relocation of staff to London, Waterloo, Windsor & Sarnia*

*In option 5 the additional 53 spaces in Hamilton would not be use*

Employees Commuting from London, Sarnia and Windsor

# APPENDIX E

# Commute Patterns



# Employees Commuting

| VP | # of Staff that commutte more than 60 mins | Live within 30 mins of | | |
|---|---|---|---|---|
| | | Windsor | London | Sarnia |
| Adams, John | 3 | 4 | 1 | 1 |
| Kenney,Greg | 0 | 0 | 0 | 0 |
| Phillips, Jacqueline | 0 | 0 | 0 | 0 |
| Dill, Julie | 2 | 0 | 1 | 0 |
| Baker, Steve | 9 | 1 | 3 | 1 |
| Birmingham,Rick | 0 | 0 | 0 | 1 |
| Bremner, John | 13 | 3 | 2 | 3 |
| Pydee,Bruce | 0 | 0 | 0 | 0 |
| Bodnar, Bohdan | 0 | 0 | 0 | 0 |
| Rietdyk, Paul | 7 | 1 | 0 | 3 |
| Sword, David | 0 | 0 | 0 | 0 |
| Ydreos,Mel | 6 | 4 | 1 | 2 |
| Craft, Stephen | 18 | 11 | 4 | 2 |
| Martucci, Joe | 3 | 6 | 0 | 2 |
| Shannon, Mike | 14 | 2 | 5 | 4 |
| Sorbell, Steven | 1 | 0 | 0 | 0 |
| Drake, J | 0 | 0 | 0 | 0 |
| Haynes, James | 0 | 0 | 0 | 0 |
| McGraw, John | 0 | 0 | 0 | 0 |
| Phillips,Patricia | 0 | 1 | 0 | 0 |
| total | 76 | 33 | 17 | 19 |

Capital Budget Details

# APPENDIX F

# Capital Requirements

- Base-line ($65 M):
  - Base building life-cycle expenditure as a prudent owner to maintain the status quo - $51.4 M excluding Hamilton
  - Replacement of Hamilton Strathearn site ($13.6 - $17.9 M)
- Discretionary components:
  - Timing of investments in buildings/components
  - Minimum investment to address code, health and safety and reliability (excluding Hamilton)
  - Value engineering for each building investment - detailed design
  - Timing of replacement of Hamilton Strathearn site
  - Fit-up/re-stack of Chatham Corporate to address overcrowding
  - Re-location of 496 Riverview
  - Space allocation, purchase /lease of new site in Chatham

| Location | Base Case ($'s in thousands) | Option 1 ($'s in thousands) | Option 2 ($'s in thousands) | Option 3 ($'s in thousands) | Option 4 ($'s in thousands) | Option 5 ($'s in thousands) |
|---|---|---|---|---|---|---|
| London | $ 11,358 | $ 11,358 | $ 11,328 | $ 11,358 | $ 11,358 | $ 11,358 |
| Waterloo | $ 10,111 | $ 10,100 | $ 10,100 | $ 10,100 | $ 10,100 | $ 10,100 |
| Ed Center | $ 350 | $ 350 | $ 350 | $ 350 | $ 350 | $ 350 |
| 496 Riverview | $ 6,500 | $ 6,500 | $ 6,500 | $ 6,500 | $ 6,500 | $ 6,500 |
| 555 Riverview | $ 80 | $ 80 | $ 80 | $ 80 | $ 80 | $ 80 |
| **Sub Total** | $ 28,399 | $ 28,388 | $ 28,358 | $ 28,388 | $ 28,388 | $ 28,388 |
| Hamilton Building | $ 13,650 | $ 13,650 | $ 13,650 | $ 13,650 | $ 17,925 | $ 17,925 |
| Base Bldg Chatham Corp | $ 23,017 | $ 42,392 | $ 23,017 | $ 23,017 | $ 23,017 | $ 23,017 |
| Undisclosed location Chatham | $ - | $ - | $ - | $ - | $ - | $ 11,500 |
| **Sub Total** | $ 23,017 | $ 42,392 | $ 23,017 | $ 23,017 | $ 23,017 | $ 34,517 |
| Chatham Corp Interior Fit up | $ - | $ 9,186 | $ 9,186 | $ 9,186 | $ 9,186 | $ 9,186 |
| **Total** | $ 65,066 | $ 93,616 | $ 74,211 | $ 74,241 | $ 78,516 | $ 90,016 |

**Notes:**

1.) Base Case and all options assume the existing data center space will be reclaimed as office space, cost to fit up new data center space is included in these costs

2.) Options 1, 2, 3, 4 and 5 include $9,186K to restack and refit current building at 50 Keil

3.) Option 4 and 5 include space for additional 53 staff in Hamilton to accommodate potential demand for COE

4.) Option 4 and 5 include moving out of 750 Richmond for O&M cost saving of $202,673 pr year

5.) 496 Riverview is relocated into the Ed Center for a cost saving in the O&M of $90K pr year

# Capital Requirements – based on 200 sq ft per FTE

- The cost of the large addition to 50 Keil would cost $32. 7M
- Options 2 and 3 would require additional space in undisclosed location in Chatham to accommodate all staff displaced from 50 Keil.

| Location | Base Case ($'s in thousands) | Option 1 ($'s in thousands) | Option 2 ($'s in thousands) | Option 3 ($'s in thousands) | Option 4 ($'s in thousands) | Option 5 ($'s in thousands) |
|---|---|---|---|---|---|---|
| London | $ 11,358 | $ 11,358 | $ 11,358 | $ 11,358 | $ 11,358 | $ 11,358 |
| Waterloo | $ 10,100 | $ 10,100 | $ 10,100 | $ 10,100 | $ 10,100 | $ 10,100 |
| Ed Center | $ 350 | $ 350 | $ 350 | $ 350 | $ 350 | $ 350 |
| 496 Riverview | $ 6,500 | $ 6,500 | $ 6,500 | $ 6,500 | $ 6,500 | $ 6,500 |
| 555 Riverview | $ 80 | $ 80 | $ 80 | $ 80 | $ 80 | $ 80 |
| **Sub Total** | $ 28,388 | $ 28,388 | $ 28,388 | $ 28,388 | $ 28,388 | $ 28,388 |
| Hamilton Building | $ 13,650 | $ 13,650 | $ 13,650 | $ 13,650 | $ 17,925 | $ 17,925 |
| Base Bldg Chatham Corp | $ 23,017 | $ 55,703 | $ 23,017 | $ 23,017 | $ 23,017 | $ 23,017 |
| Undisclosed location Chatham | $ - | $ - | $ 11,500 | $ 11,500 | $ - | $ 11,500 |
| **Sub Total** | $ 23,017 | $ 55,703 | $ 34,517 | $ 34,517 | $ 23,017 | $ 34,517 |
| Chatham Corp Interior Fit up | $ - | $ 9,186 | $ 9,186 | $ 9,186 | $ 9,186 | $ 9,186 |
| **Total** | $ 65,055 | $ 106,927 | $ 85,741 | $ 85,741 | $ 78,516 | $ 90,016 |

**Notes:**

1.) Base Case and all options assume the existing data center space will be reclaimed as office space, cost to fit up new data center space is included in these costs

2.) Options 1, 2, 3, 4 and 5 include $9,186,000 to restack and refit current building at 50 Keil

3.) Option 4 and 5 include space for additional 53 staff in Hamilton to accommodate potential demand for COE

4.) Option 4 and 5 include moving out of 750 Richmond for O&M cost saving of $202,673 pr year

5.) 496 Riverview is relocated into the Ed Center for a cost saving in the O&M of $90K pr year

# Capital Budgets

| Base Case | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Location** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **Total** |
| | | | | | | | |
| 50 Keil | $145,000 | $550,000 | $8,680,000 | $5,494,000 | $5,698,000 | $2,450,000 | $23,017,000 |
| Hamilton | $2,300,000 | $4,400,000 | $6,950,000 | $0 | $0 | $0 | $13,650,000 |
| London | $500,000 | $3,418,000 | $6,090,000 | $0 | $0 | $1,350,000 | $11,358,000 |
| Waterloo | $2,203,000 | $5,172,000 | $0 | $0 | $0 | $2,725,000 | $10,100,000 |
| Ed Centre | $0 | $0 | $0 | $0 | $0 | $350,000 | $350,000 |
| 555 Riverview | $80,000 | $0 | $0 | $0 | $0 | $0 | $80,000 |
| 496 Riverview | $0 | $0 | $0 | $3,300,000 | $3,200,000 | $0 | $6,500,000 |
| | | | | | | | |
| **Total** | $5,228,000 | $13,540,000 | $21,720,000 | $8,794,000 | $8,898,000 | $6,875,000 | $65,055,000 |

| Option 1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Location** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **Total** |
| | | | | | | | |
| 50 Keil | $ 145,000 | $ 550,000 | $ 8,930,000 | $14,931,000 | $15,135,000 | $11,887,000 | $51,578,000 |
| Hamilton | $ 2,300,000 | $ 4,400,000 | $ 6,950,000 | $ - | $ - | $ - | $13,650,000 |
| London | $ 500,000 | $ 3,418,000 | $ 6,090,000 | $ - | $ - | $ 1,350,000 | $11,358,000 |
| Waterloo | $ 2,203,000 | $ 5,172,000 | $ 2,725,000 | $ - | $ - | $ - | $10,100,000 |
| Ed Centre | $ - | $ - | $ - | $ - | $ - | $ 350,000 | $ 350,000 |
| 555 Riverview | $ 80,000 | $ - | $ - | $ - | $ - | $ - | $ 80,000 |
| 496 Riverview | $ - | $ - | $ - | $ 3,300,000 | $ 3,200,000 | $ - | $ 6,500,000 |
| | | | | | | | |
| **Total** | $ 5,228,000 | $13,540,000 | $24,695,000 | $18,231,000 | $18,335,000 | $13,587,000 | $93,616,000 |

# Capital Budgets

| Option 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Location** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **Total** |
| | | | | | | | |
| 50 Keil | $ 145,000 | $ 550,000 | $ 8,680,000 | $ 8,556,000 | $ 8,760,000 | $ 5,512,000 | $32,203,000 |
| Hamilton | $ 2,300,000 | $ 4,400,000 | $ 6,950,000 | $ - | $ - | $ - | $13,650,000 |
| London | $ 500,000 | $ 3,418,000 | $ 6,090,000 | $ - | $ - | $ 1,350,000 | $11,358,000 |
| Waterloo | $ 2,203,000 | $ 5,172,000 | $ - | $ - | $ - | $ 2,725,000 | $10,100,000 |
| Ed Centre | $ - | $ - | $ - | $ - | $ - | $ 350,000 | $ 350,000 |
| 555 Riverview | $ 80,000 | $ - | $ - | $ - | $ - | $ - | $ 80,000 |
| 496 Riverview | $ - | $ - | $ - | $ 3,300,000 | $ 3,200,000 | $ - | $ 6,500,000 |
| | | | | | | | |
| **Total** | $ 5,228,000 | $13,540,000 | $21,720,000 | $11,856,000 | $11,960,000 | $ 9,937,000 | $74,241,000 |

| Option 3 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Location** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **Total** |
| | | | | | | | |
| 50 Keil | $ 145,000 | $ 550,000 | $ 8,680,000 | $ 8,556,000 | $ 6,760,000 | $ 7,512,000 | $32,203,000 |
| Hamilton | $ 2,300,000 | $ 4,400,000 | $ 6,950,000 | $ - | $ - | $ - | $13,650,000 |
| London | $ 500,000 | $ 3,418,000 | $ 6,090,000 | $ - | $ - | $ 1,350,000 | $11,358,000 |
| Waterloo | $ 2,203,000 | $ 5,172,000 | $ - | $ - | $ - | $ 2,725,000 | $10,100,000 |
| Ed Centre | $ - | $ - | $ - | $ - | $ - | $ 350,000 | $ 350,000 |
| 555 Riverview | $ 80,000 | $ - | $ - | $ - | $ - | $ - | $ 80,000 |
| 496 Riverview | $ - | $ - | $ - | $ 3,300,000 | $ 3,200,000 | $ - | $ 6,500,000 |
| | | | | | | | |
| **Total** | $ 5,228,000 | $13,540,000 | $21,720,000 | $11,856,000 | $ 9,960,000 | $11,937,000 | $74,241,000 |

# Capital Budgets

| Option 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Location** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **Total** |
| 50 Keil | $ 145,000 | $ 550,000 | $ 8,680,000 | $ 8,556,000 | $ 8,760,000 | $ 5,512,000 | $32,203,000 |
| Hamilton | $ 2,300,000 | $ 6,650,000 | $ 8,975,000 | $ - | $ - | $ - | $17,925,000 |
| London | $ 500,000 | $ 3,418,000 | $ 6,090,000 | $ - | $ - | $ 1,350,000 | $11,358,000 |
| Waterloo | $ 2,203,000 | $ 5,172,000 | $ - | $ - | $ - | $ 2,725,000 | $10,100,000 |
| Ed Centre | $ - | $ - | $ - | $ - | $ - | $ 350,000 | $ 350,000 |
| 555 Riverview | $ 80,000 | $ - | $ - | $ - | $ - | $ - | $ 80,000 |
| 486 Riverview | $ - | $ - | $ - | $ 3,300,000 | $ 3,200,000 | $ - | $ 6,500,000 |
| **Total** | $ 5,228,000 | $15,790,000 | $23,745,000 | $11,856,000 | $11,960,000 | $ 9,937,000 | $78,516,000 |

| Option 5 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Location** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **Total** |
| 50 Keil | $ 145,000 | $ 550,000 | $14,430,000 | $14,306,000 | $ 8,760,000 | $ 5,512,000 | $43,703,000 |
| Hamilton | $ 2,300,000 | $ 6,650,000 | $ 8,975,000 | $ - | $ - | $ - | $17,925,000 |
| London | $ 500,000 | $ 3,418,000 | $ 6,090,000 | $ - | $ - | $ 1,350,000 | $11,358,000 |
| Waterloo | $ 2,203,000 | $ 5,172,000 | $ - | $ - | $ - | $ 2,725,000 | $10,100,000 |
| Ed Centre | $ - | $ - | $ - | $ - | $ - | $ 350,000 | $ 350,000 |
| 555 Riverview | $ 80,000 | $ - | $ - | $ - | $ - | $ - | $ 80,000 |
| 486 Riverview | $ - | $ - | $ - | $ 3,300,000 | $ 3,200,000 | $ - | $ 6,500,000 |
| **Total** | $ 5,228,000 | $15,790,000 | $29,495,000 | $17,606,000 | $11,960,000 | $ 9,937,000 | $90,016,000 |

# Historic Capital Spend

**2005 - 2009 Capital Spend**

| Project | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|
| Province-Wide Projects | $6,258,785 | $2,829,876 | $3,187,105 | $1,858,485 | $1,200,969 |
| 50 Keil Dr. | $1,979,313 | $3,543,646 | $245,954 | $531,573 | |
| Cobourg Land Purchase | $77,614 | -$77,614 | | | |
| Cobourg Building | | $1,627,144 | $8,699 | | |
| Owen Sound Land Purchase | $60,607 | -$60,607 | | | |
| Owen Sound Building | | $1,383,824 | -$17,706 | | |
| Burlington Building | | $1,462,980 | $8,005,977 | $3,146,219 | |
| Windsor Building | | $1,255,653 | | $7,456,821 | $6,066,000 |
| Kingston Building | | $460,314 | $917,813 | $2,493,578 | $8,516,926 |
| **Total** | **$8,376,319** | **$12,425,216** | **$12,347,842** | **$15,486,676** | **$15,783,895** |

Virtual Teams - Summary of IT required to enable

# APPENDIX G

# Virtual Teams: Technology

Technology enables “virtual presence” for remote team members working in a different physical location from their core team. It facilitates improved communication within these virtual teams but requires training, cultural adjustments, and general acceptance at a corporate level in order to be successful.

Features

- Video Conferencing, VPN, Instant messaging, soft phones (laptop) is available now
- Voice mail to email, video chat, one number dialling, and other functionality would need to be implemented

Costs

- We can tailor the initial deployment to line up with the existing 2010 budget
- New technologies and network enhancements may be driven into the 2011 budget

Implications

- Consistent adoption of the technologies by employees is necessary to fully expose value
- It will be difficult for some to adapt – is it a competency?

Strategy

- The same technologies will align with tele-worker and STAT team initiatives
- developing a workforce skilled in communicating with others remotely can be a key differentiator for us in the future

Summary of Manager Survey and Change Management Recommendations for Adoption of Alternate Work Place Solutions

# APPENDIX H

# Highlights of Findings From Manager Survey

- High level of support for solutions that provide flexibility and virtual teams;
- Recruiting: location can be a challenge for specific roles (professionals);
- Work Place attributes – consensus on:
  - Improving the appearance of workplaces;
  - Offering flexibility;
  - Containing costs;
  - Reducing commute time;
  - Connectivity technology needs improvement;
  - Mentoring and personal meeting times are important
- Comments on current space: over-crowding, need for meeting rooms, acoustic and visual privacy;
- Leadership readiness: culture of trust, but some concerns about change readiness;
- Anticipated resistance to change:  prepare, communicate rationale and impacts

# Distributed Work and Virtual Teams

- A virtual team is a group of individuals who work:
  - Across time, space, and organizational boundaries
  - Links strengthened by communication technology.
- Function as a team: committed to a shared purpose, have interdependent performance goals
- Communicate electronically, often plan to meet face-to-face
- A virtual team does not always mean a teleworker – individuals who work from home
- Many virtual teams consist of some people working at home and others working in offices, but in different geographic locations
- Benefits:
  - Hire and retain the best people, regardless of location
  - Form project teams based on most suitable talent, regardless of location

The following groups within Union Gas currently function as Virtual Teams:

- Government Affairs,
- Engineering Design and Execution,
- Energy Conservation for Residential Markets,
- Strategic Accounts Sales and Marketing,
- Market Development,
- Customer Care,
- Corporate Real Estate Services,
- Distribution Construction and Maintenance,
- Operations Support and Administration,
- Spectra Energy Engineering and Construction,
- Employee Relations (not including those reps who deal directly with district staff).

# Guiding Principles for Migration

ULG should establish a process and principles for this decision:

- Maximize natural adoption – managers should self-identify;
- Create critical mass for function in new location - focus on business units that:
  - Are willing to adopt a distributed work model
  - Have recruitment challenges
- Build on existing work styles and patterns and adopt over time

| Work Style | Potential Example | Candidate to Move? |
|---|---|---|
| Tied to current location | District Offices, Capacity Management (Gas Control Room). | No |
| High levels of internal team interaction and strong adjacency requirements | Business Development, Storage and Transmission, Capacity Management | No |
| Currently functions as a distributed team | Human Resources, Customer Care | Yes |
| Could function as a distributed team | Portions of Engineering, Construction and Storage, Facilities | Yes, however establish a nucleus / critical mass in new location |
| Support function with a high need for local client interface | Employee relations staff, IT desk-side support | No |
| Support function with corporate wide responsibilities | Communications, government relations, portions of IT, | Yes |
| High future need for recruitment of specialized skills | Engineering, Construction and Storage, Finance, Tax | Yes, however establish a nucleus / critical mass for team in new location |
| Centre of Excellence | Drafting, Planning, Dispatch | Yes |

# Change Management Recommendations

## Moving Towards Distributed Work Models for Suitable Groups

- Validate their interest in and openness/readiness for change through focus groups
- Communicate and raise awareness that Union Gas currently uses distributed work models and virtual teams on an informal basis
- Communicate the benefits and challenges inherent in these new models
- Research how and where these teams currently work, then co-create possible scenarios that would provide flexibility, convenience and choice
- Pilot the approach with those groups most ready and suitable for virtual teamwork
- Invest in connecting tools and technology that will support a productive and engaged acceptance and implementation of a distributed work model
- Ensure adequate opportunities and place to meet face-to-face as a team for collaboration and relationship-building
- Reinforce the continuity of the Union Gas ‘family’ culture while adding the importance of increased flexibility and trust
- Continually seek feedback, make corrective measures, and communicate progress from the most senior levels

# Change Management Recommendations

- Provide professional coaching and development for managers to feel comfortable about managing geographically dispersed teams and overcoming the belief that ‘if you are not at your desk you are not working’
- Refresh and update performance management training for managers to monitor staff performance by outcomes and outputs
- Ensure that managers have clear expectations and accountability for ongoing coaching and team development
- Provide training and accessible, ongoing support in the use of enabling technology
- Standardize flexible working policies while leaving detailed decisions to line managers
- Share best practices and lessons learned across the organization

# Change Management Recommendations

## Successfully Establishing Nucleus Teams through Relocation

- Taking advantage of relocating selected groups to other locations in order to broaden recruitment and enhance retention will represent a mixed model of virtual team and centre of excellence
- Engage the team in identifying the critical mass and functions needed in the new location, ideally starting with a visible and reasonably high priority project
- Invite staff to self-identify for the move with the final mix to be approved by the manager – while leaving future possibilities open to existing and new staff
- Provide incentives for leading in the change – e.g., opportunity to work on an exciting initiative, increased visibility to senior leaders, recognition as experts
- Develop mentoring ‘contracts’ and protocols between new and experienced staff in both the new and old location to enhance sharing of knowledge and to sustain strong relationships
- As with any distributed team, provide the best communications tools and opportunities for face-to-face connection

Key Findings – Campus Recruiting

# APPENDIX I

# Key Findings – Campus Recruiting 2005 - 2010

- 54% of all grads are hired from 2 of the 12 to 15 universities Union Gas recruits from (Windsor and Western);
- 20% are hired from Maritime based universities (comparable to all other in-franchise universities combined);
- 7% - 11% of Windsor and Western students in the targeted disciplines apply to Union Gas, 1% - 4% from other franchise universities;
- 54% of employment offers are declined (0% declines from Windsor, 20% Western); Note: there were no declines in 2009/2010;
- 60% of new hires resided in Windsor/Chatham/Sarnia/London areas;
- International students and Maritime grads account for a higher percentage of new hires than other in-franchise grads;

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 5, page 5

Please provide a business case analysis for the Owen Sound Replacement project. What is the current status of the project? What factors could delay the in-service date?

---

**Response:**

Please see the response at Exhibit J.B-1-1-2.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 7, page 1

Please provide a schedule setting out Union's total IT budget for the years 2007-2013. For 2007 please include Board approved and the IT budget applied for. Please provide a breakdown of each of those budgets into major projects/cost categories.

---

**Response:**

Please see Attachment 1. As stated at Exhibit B1, Tab 2 Updated, Union does not have a detailed 2007 Board-approved capital budget.

Union Gas Limited

Details of Capital Expenditures for IT Projects in excess of $500,000

Calendar Year ending December 31, 2007 t0 2013 Forecast

| Function | Forecast 2007 | Total Actual 2007 | Total Actual 2008 | Total Actual 2009 | Total Actual 2010 | Total Actual 2011 | Total Forecast 2012 | Total Forecast 2013 |
|---|---|---|---|---|---|---|---|---|
| **Evidence Reference** | | | | | | | | |
| **General** | | | | | | | | |
| ITE Project | 7,670 | 4,220 | 3,964 | 5,648 | 4,994 | 7,163 | 8,198 | 9,208 |
| Gas Distribution Access Rules | 8,100 | 2,356 | | | | | | |
| Replace RM/MC Software | 610 | 1,847 | 1,104 | | | | | |
| CARE Compliance/Product Development | 1,250 | | | | | | | |
| GIS Upgrade Phase 1 | 1,000 | 881 | 2,692 | 2,455 | 2,499 | | | |
| Business Continuity Plan | 470 | 375 | | | | | | |
| CARE Reliability | 900 | 564 | 418 | | | | | |
| Tracking Gas Acquisitions | 300 | | | | | | | |
| Operations Compliance | 400 | | 59 | | | | | |
| Customer Care M2 Split | 700 | 361 | | | | | | |
| ConTrax Compliance | 1,450 | 681 | 736 | | | | | |
| IVR Replacement | 1,100 | 819 | | | | | | |
| SCADA Telemetry Replacement | 1,000 | 807 | 1,601 | 1,162 | 1,245 | | | |
| Online B2B Customer Care | 1,000 | | 294 | | | | | |
| Process Interface Integrity | 1,000 | | | | | | | |
| Financial Reporting & Integration | 750 | | | | | | | |
| VB.Net Rewrites | 550 | 310 | 742 | 728 | 301 | | | |
| SCADA Replacement | 500 | 820 | 849 | 1,751 | 3,247 | 2,666 | | |
| Automate Backend Processes | 500 | | | | | | | |
| Customer Support Reliability | | 581 | | | | | | |
| ESPM (NGEIR) | | 1,932 | 2,917 | | | | | |
| Focus (CM System Automation) | | - | 1,164 | 1,334 | | | | |
| SAP East ERP Upgrade | | - | 953 | 184 | | | | |
| S&T Application Enhancement | | | 1,786 | | | | | |
| IT Demand Management - Bus Development/S&T | | | | 677 | | 2,801 | | |
| Probability and Risk Optimization | | | | 573 | 1,202 | 597 | | |
| Panasonic Laptops | | | | | 2,307 | | | |
| SAP BCP Implementation | | | | | 834 | | | |
| GIS Replacement | | | | | | 1,432 | | |
| IS Projects | | | | | | 2,096 | 2,000 | 2,000 |
| Supply Chain Excellence Program | | | | | | 825 | 130 | |
| Gas Measurement Business Intelligence | | | | | | 2,168 | 600 | |
| Business Support | | | | | | | 2,835 | 2,325 |
| Contact Centre Infrastructure - VOIP | | | | | | | 750 | 750 |
| IS Application Lifecycle Projects | | | | | | | 1,500 | |
| CARE / Contrax Replacements | | | | | | | 3,062 | 9,277 |
| EAM (Enterprise Asset Management) | | | | | | | 1,000 | 4,000 |
| GMAS Upgrade | | | | | | | 630 | |
| Meter Reading Replacement | | | | | | 1,068 | 3,000 | |
| SCADA Enchancements | | | | | | | 852 | 602 |
| Data Centre DRP Update | | | | | | 1,114 | | |
| OEB Customer Service | | | | | | 595 | | |
| Voice Network Sustainment | | | | | | | | |
| General Projects listed above | $ 29,250 | $ 16,554 | $ 19,279 | $ 14,512 | $ 16,629 | $ 22,525 | $ 24,557 | $ 28,162 |
| General Projects less than $500,000 | 7,100 | 4,128 | 1,626 | 3,713 | 3,702 | 362 | 884 | 173 |
| | **$ 36,350** | **$ 20,682** | **$ 20,905** | **$ 18,225** | **$ 20,331** | **$ 22,887** | **$ 25,441** | **$ 28,335** |

Please refer to Exhibit B, Tab 2, Pg 2 of 13 for an explanation on 2007 Board Approved Capital Budget

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 7, page 10

Union's practice has been to replace core network equipment, general purpose servers, and desktop and laptop computers after approximately 3 years of service. How long has this practice been in place? For the years 2007-2013 please provide a schedule setting out the number of employees, the number of desktops and the number of laptops. Please provide the actual expenditures on desktops and laptops in each year. What is Union's policy regarding laptops for its employees?

---

**Response:**

The practice of life cycling equipment on a defined schedule has been in place since the mid 1990s.

The following chart provides the data requested;

Workstation Life Cycle

| | Year | Workstation Costs | Employees | Number of Laptops | Number of Desktops | Laptops Replaced/ Installed | Desktops Replaced/ Installed |
|---|---|---|---|---|---|---|---|
| Actual | 2007 | $1,971,185 | 2,147 | n/a | n/a | 161 | 116 |
| Actual | 2008 | $1,389,448 | 2,201 | n/a | n/a | 388 | 452 |
| Actual | 2009 | $1,732,768 | 2,183 | 1,238 | 1,122 | 336 | 156 |
| Actual | 2010 | $1,861,091 | 2,211 | 1,480 | 1,093 | 328 | 85 |
| Actual | 2011 | $1,302,378 | 2,219 | 1,636 | 1,047 | 433 | 236 |
| Budget | 2012 | $1,636,281 | 2,319 | | | 470 | 50 |
| Budget | 2013 | $1,444,557 | 2,317 | | | 388 | 46 |

Notes:

- Workstation total expense/budget include configuration, shipping, labour to install, and any disposal costs.
- Ruggedized/Specialized Laptops not included.
- Due to timing of large purchases at manufacturer year end, replacements in some years are using equipment purchased in prior year.

- Number of workstations is higher than employees as additional workstations are required for testing/training facilities, Disaster Recovery Plan and contract resources.
- Union is targeting to extend the life of desktops beyond 3 years starting in 2012 thus reducing the number of replacements per year.

The determination of who is provided a laptop vs a desktop is based on the type and requirements of the role. Employees in the Customer Contact and Billing Centres are provided desktops. Utility Service Representatives that are constantly on the road have laptops in their vehicles. For general office workers, their manager is required to confirm they have a requirement for mobility before a laptop is provided.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pg 1-6

Preamble: Union discusses the Parkway compressor station and the proposed Parkway West Project.

a) Please provide a diagram showing all existing and proposed connections between Union and all parties in the Parkway / Lisgar area. Please identify which connections are existing connections and which are proposed.

b) Please provide Union's current delivery capability (in GJ/d) at each of these connections. Please identify any changes to Union's current delivery capability at each of the connections as a result of the proposed Parkway West Project.

c) Please provide Union's actual and forecast total annual deliveries (in GJ), average daily deliveries (in GJ/d), and peak day deliveries (in GJ) at each of these connections for each of the calendar years 2000 to 2015.

---

**Response:**

a) Please see the response at Exhibit J.B-1-1-2.

b)

| Delivery Capability (GJ/d) | Current | Proposed |
|---|---|---|
| Dawn to Parkway (TCPL) | 2,540,000 | No Change |
| Dawn to Parkway (Consumers) | 1,360,000 | No Change |
| Dawn to Enbridge Lisgar | 795,800 | No Change |

c) The table below provides the actual deliveries at each connection from 2007 to 2011:

| Actual Annual Deliveries (GJ) | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| Dawn to Parkway (TCPL) | 248,649,841 | 301,645,092 | 317,267,540 | 458,465,720 | 455,046,962 |
| Dawn to Parkway (Consumers) | 149,731,698 | 152,227,482 | 148,203,700 | 146,977,980 | 136,052,462 |
| Dawn to Enbridge Lisgar | 10,973,955 | 2,147,000 | 11,069,620 | 5,780,000 | 9,780,000 |
| | | | | | |
| Actual Average Daily Deliveries (GJ/d) | | | | | |
| Dawn to Parkway (TCPL) | 681,232 | 824,167 | 869,226 | 1,256,070 | 1,246,704 |
| Dawn to Parkway (Consumers) | 410,224 | 415,922 | 406,038 | 402,679 | 372,746 |
| Dawn to Enbridge Lisgar | 30,066 | 5,866 | 30,328 | 15,836 | 26,795 |
| | | | | | |
| Actual Peak Day Deliveries (GJ/d) | | | | | |
| Dawn to Parkway (TCPL) | 1,182,301 | 1,766,574 | 2,392,990 | 2,477,748 | 2,093,163 |
| Dawn to Parkway (Consumers) | 1,460,700 | 1,355,903 | 1,359,495 | 1,462,257 | 1,277,442 |
| Dawn to Enbridge Lisgar | 415,159 | 422,582 | 299,171 | 142,974 | 430,628 |

Forecast deliveries are only available for peak day deliveries, and can be found in the table below:

| Design Day Deliveries (Forecast) (GJ/d) | 2011/2012 | 2013/2014 |
|---|---|---|
| Dawn to Parkway (TCPL) | 2,459,230 | 2,566,982 |
| Dawn to Parkway (Consumers) | 832,049 | 832,049 |
| Dawn to Enbridge Lisgar | 795,344 | 795,344 |

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pg 2

Preamble: Union discusses its expectation that firm demand at the discharge [sic] at Parkway will continue to increase through to 2015/2016 as a result of (among other things):

i) Growth in three markets: (a) the Greater Toronto Area (GTA) (b)key eastern Canadian and (c) key US Northeast markets; and

ii) Union's desire to partially supply the northern and eastern franchise areas through short-haul service.

a) Please explain and quantify the expected growth in each of the three market areas discussed above by year for 2012 to 2016.

b) Please provide any studies or analyses that Union has conducted or had conducted on its behalf concerning the demand in each of these three market areas.

c) Please identify which eastern Canadian markets are "key" eastern Canadian markets, and explain why they are key markets.

d) What pipeline paths will be used to serve these key eastern Canadian markets downstream of Parkway that supports Union estimates of the increase in demand at the discharge side of Parkway?

e) Please identify which US Northeast markets are "key" US Northeast markets, and explain why they are "key" markets.

f) What pipeline paths will be used to serve these key US Northeast markets downstream of Parkway that supports Union estimates of the increase in demand at the discharge side of Parkway?

g) Does "partially" in the reference above mean (a) part of existing market demand; (b) part of new market demand; (c) all of new market demand; or (d) something else? Please specify.

h) Please quantify the portion of the northern and eastern franchise areas that Union intends to serve with short-haul service, indicating the intended quantities in each of Union's Western, Sault Ste. Marie, Northern, North Central, Central and Eastern Delivery Areas. Please also provide this information as a percentage of the total market served in each area.

i) Please explain how Union expects that the firm demand caused by growth in the GTA will be met by Union physically and contractually. Does Union expect that this growth will be met by parties contracting for (a) firm capacity of greater than one year, (b) discretionary services such as seasonal, interruptible services or (c) some other services on the Union System?

j) Has Union completed any studies that determine the impact on TransCanada tolls as a result of serving these growing markets with short- haul services? If so, please provide the studies. If not, why not?

---

**Response:**

a) Exports at Parkway are defined as deliveries by Union into the TCPL system. Imports at Parkway are defined as receipts from TCPL into the Union system.

Exports through Parkway can be impacted by growing demands, markets shifting from long-haul to short-haul transportation and the emergence of new U.S. gas supply seeking Ontario, eastern Canadian and U.S. Northeast markets.

TCPL has proposed the 2012 Eastern Mainline Expansion Project to increase capacity east of Parkway by approximately 0.4 PJ/d (2012/2013). In addition, Union has had confidential discussions with a number of customers downstream of Parkway and expects market demand for transportation through Parkway of at least another 0.6 PJ/d by 2016.

As of November 2012, approximately 0.8 Bcf/d (0.85 PJ/d) of Marcellus gas supply is contracted for delivery to the New York/Ontario border at Niagara and Chippawa. This gas supply can access Ontario through the TCPL system to Kirkwall and, with appropriate expansion, be transported to markets east of Parkway, replacing declining Western Canadian Sedimentary Basin gas supply. Approximately half of this volume has already been contracted to flow east of Parkway through the TCPL 2012 Eastern Mainline Expansion Project.

In addition to Union's current open season for Dawn-Parkway capacity and the proposed Parkway Extension Project, TCPL released an open season in March 2012 as a result of new requests for firm transportation capacity to connect Marcellus gas supply to Canadian and U.S. Northeast markets.

Union also notes that currently TCPL transports approximately 0.5 PJ/d of gas intended for markets east of Parkway "around the horn". With expansion through the Parkway-Maple corridor, those quantities could flow through the more direct Dawn-Parkway path.

b) Please see the response at a) above. Union has not conducted any studies concerning the demand for these three market areas.

c) Please see the response at a) above. The "key" eastern Canadian markets downstream of Parkway are northern, eastern and central Ontario (and possibly western Ontario) and Quebec natural gas utilities, direct purchase customers and gas-fired generators.

d) The pipeline paths to serve key eastern Canadian markets downstream of Parkway will utilize TCPL facilities from Parkway to points west, north or east or from Maple to points west, north or east (potentially with Parkway to Maple transportation provided by the Parkway Extension Project) with a possibility of delivering gas into Enbridge's proposed GTA Project at Parkway.

e) Please see the response at a) above. The "key" U.S. Northeast markets are natural gas utilities and gas-fired generators.

f) Please see the response at d) above. The TCPL system east of Parkway connects to the Iroquois Gas Transmission System for deliveries to the U.S. Northeast.

g) Union would define partially to be part of existing demand and part of any new market demand.

h) Union is still evaluating the level to which these services will be required. It will be subject to the availability and price of these services.

i) Ultimately, growth in the GTA is expected to be served through a mix of services available in the market. Union expects that any required facilities expansion to serve growth in the GTA will be underpinned by long-term, firm contracts.

j) No. The impact on tolls will depend on many different parameters including what, if any, capacity is turned back to TCPL, what new capacity is contracted on TCPL and the outcome of the TCPL Mainline 2012-2013 Tolls Application (RH-003-2011). Union would point out that the impact on TCPL tolls would be similar whether the new markets are served by TCPL's expansion on Union's Parkway Extension Project (see the response at Exhibit J.B-1-7-15).

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pg 2

Preamble: Union states its expectation that design day demand for exports through Parkway compression could exceed 3.0 PJ/d by 2015/2016.

a) Please explain how Union arrived at this expectation of an increase from the current 2.0 PJ/d to 3.0PJ/d. Please provide all studies and analyses that Union has conducted or had conducted for it concerning demand growth for exports through Parkway compression through to the end of 2016.

---

**Response:**

a) Please see the response at Exhibit J.B-1-7-2 a) and Exhibit J.B-1-7-2 b).

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pg 1 and pg 3

Preamble: Union states that "Year-round exports through the Parkway compression have impacted the ability to schedule maintenance activities for the Parkway A Unit and Parkway B Unit as well as the associated facilities." and discusses the deliverability capability of each of the Parkway Units.

a) Please explain the typical maintenance requirements at each of the Parkway Units including expected elapsed time required to complete this maintenance.

b) Please provide the dates in 2010 and 2011 when Union performed maintenance on each of the Parkway units and the volumetric flows on an hourly basis during those dates.

c) Please provide the dates during the months of June to September 2010 and 2011 when the volumetric flows through Parkway compression were greater than:

   i) 1.0 PJ/d; and

   ii) 1.8 PJ/d.

d) Please provide the (a) current firm delivery capability to Parkway (TCPL); (b) the current total delivery capability at Parkway (TCPL); and, (C) the total current firm contracted delivery requirement to Parkway (TCPL) (in GJ/d).

e) Please confirm that Union would be able to maintain 1.0 PJ/d of deliverability capability to Parkway (TCPL) if the Parkway B Unit was lost and 1.8 PJ/d of deliverability capability to Parkway (TCPL) if the Parkway A Unit was lost. If this is not correct please provide the correct amounts.

---

**Response:**

a) Typical maintenance requirements on the two Parkway units are as follows:

| Maintenance Activity | Parkway A | Parkway B |
|---|---|---|
| Soak Wash/Inspection | 10.5 hours (Every 750 Op. Hrs[1]) | 10.5 hours (Every 1000 Hrs) |
| Suction Scrubber Inspection | 6.5 hours (Annual) | 8 hours (Semi-Annual) |
| Fire Detection/ESD Inspection | 6 hours (Semi-Annual) | 6 hours (Semi-Annual) |
| Annual Inspection | 2.5 Weeks | 3 weeks |
| Gas Detection Inspection | 6 hours (Quarterly) | 6 hours (Quarterly) |
| Mid-Life Overhaul[2] | 10 days (Every 25,000 Op. Hrs) | 14 weeks (Every 25,000 Hrs) |
| End of Life Overhaul[2] | 10 days (Every 50,000 Op. Hrs) | 16 weeks (Every 50,000 Hrs) |
| Power Turbine Inspection | | |
| Power Turbine Overhaul[3] | 16 weeks (Every 100,000/50,000 Op. Hrs) | 20 weeks (Every 100,000/50,000 Op. Hrs) |
| Dry Seal Exchange | 1 week (Every 25,000 Hrs) | 2 weeks (Every 25,000 Hrs) |

[1]*Op. Hrs = Operating Hours*
[2]*Mid-Life and End of Life Overhauls for Parkway A requires two 5-day outages to remove the existing engine and install a spare (10 days total). The actual overhaul takes up to 16 weeks. Union Gas does not own a spare RB211, rendering the station unavailable for the entire duration of the overhaul. The overhaul window for Parkway B may be reduced to two 10-day outages through the installation of a lease engine at a cost of approximately $60,000/week plus fired hours. Lease RB211-24GTs are hard to obtain however.*
[3]*Power turbine overhauls are required after 100,000 operating hours initially and every subsequent 50,000 operating hours*

b) Please see Attachment 1.

c)

i) Flows during the period of June to September are easterly flows (exports). No Westerly (import) flows occurred during this time frame.

Flows above 1.0 PJ/day occurred during the months of June to September 2010 and 2011 on the following dates:

2010
June 2, June 3, June 16 – July 6, July 8 – July 28, August 5, August 10, August 11, August 25, August 29 – September 2, September 8 – September 10, September 13, September 15 – September 24

2011
July 20, 21

ii) No flows exceeded 1.8 PJ/d between June and September 2010 and 2011.

d) The current deliveries for Winter 11/12 are as follows:

i) Firm delivery capability to Parkway (TCPL) is 2.54 PJ/d, which is the physical capability of both Parkway A and B compressor units operating. When either Parkway A or Parkway B is operating in isolation, the suction pressure remains at a higher level than when they are operating together. The lower suction caused by both units operating reduces the total suction throughout.

ii) Total delivery capability at Parkway (TCPL) is physically limited by TCPL's measurement to 2.0 PJ/d.

iii) Current firm contracted delivery to Parkway (TCPL) is 1.9 PJ/d which is equivalent to the firm M12 / M12-X contracts to Parkway (TCPL) (2.58 PJ/d) minus the Union in-franchise obligated deliveries (0.66 PJ/d)

e) Please see the response at Exhibit J.B-1-7-12 b) for information on capacity of Parkway A and Parkway B in the event of an outage.

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | 1/26/11 8:00 PM | 73,092 | 2/2/11 1:00 AM | 77,213 | 3/8/11 11:00 AM | 65,291 | 5/3/11 8:00 AM | 32,806 | 6/13/11 8:00 AM | 0 | 6/27/11 8:00 AM | 0 | 6/28/11 10:00 AM | 34,715 | 6/29/11 8:00 AM | 0 | 6/30/11 2:00 PM | 28,758 | 9/29/11 4:00 PM | 0 | 11/27/11 11:00 PM | 18,242 |
| | 1/26/11 9:00 PM | 68,324 | 2/2/11 2:00 AM | 76,633 | 3/8/11 12:00 PM | 57,160 | 5/3/11 9:00 AM | 32,313 | 6/13/11 9:00 AM | 0 | 6/27/11 9:00 AM | 0 | 6/28/11 11:00 AM | 32,003 | 6/29/11 9:00 AM | 0 | 6/30/11 3:00 PM | 25,716 | 9/29/11 5:00 PM | 0 | 11/28/11 12:00 AM | 18,192 |
| | 1/26/11 10:00 PM | 67,446 | 2/2/11 3:00 AM | 76,706 | | | 5/3/11 10:00 AM | 31,902 | 6/13/11 10:00 AM | 0 | 6/27/11 10:00 AM | 0 | 6/28/11 12:00 PM | 25,319 | 6/29/11 10:00 AM | 0 | | | 9/29/11 6:00 PM | 0 | 11/28/11 1:00 AM | 18,290 |
| | 1/26/11 11:00 PM | 67,491 | 2/2/11 4:00 AM | 76,276 | | | 5/3/11 11:00 AM | 30,672 | 6/13/11 11:00 AM | 0 | 6/27/11 11:00 AM | 0 | 6/28/11 1:00 PM | 23,663 | 6/29/11 11:00 AM | 0 | | | 9/29/11 7:00 PM | 0 | 11/28/11 2:00 AM | 18,999 |
| | 1/27/11 12:00 AM | 67,397 | 2/2/11 5:00 AM | 76,610 | | | 5/3/11 12:00 PM | 29,897 | 6/13/11 12:00 PM | 0 | | | 6/28/11 2:00 PM | 22,963 | | | | | | | 11/28/11 3:00 AM | 24,688 |
| | 1/27/11 1:00 AM | 65,442 | 2/2/11 6:00 AM | 76,776 | | | 5/3/11 1:00 PM | 30,266 | 6/13/11 1:00 PM | 0 | | | 6/28/11 3:00 PM | 23,322 | | | | | | | 11/28/11 4:00 AM | 24,272 |
| | 1/27/11 2:00 AM | 58,640 | 2/2/11 7:00 AM | 77,409 | | | 5/3/11 2:00 PM | 30,819 | 6/13/11 2:00 PM | 13,838 | | | 6/28/11 4:00 PM | 24,002 | | | | | | | 11/28/11 5:00 AM | 24,297 |
| | | | 2/2/11 8:00 AM | 74,825 | | | 5/3/11 3:00 PM | 31,136 | 6/13/11 3:00 PM | 15,717 | | | | | | | | | | | 11/28/11 6:00 AM | 24,412 |
| | | | | | | | 5/3/11 4:00 PM | 30,474 | 6/13/11 4:00 PM | 15,702 | | | | | | | | | | | 11/28/11 7:00 AM | 24,958 |
| | | | | | | | 5/3/11 5:00 PM | 29,858 | 6/13/11 5:00 PM | 15,660 | | | | | | | | | | | 11/28/11 8:00 AM | 24,438 |
| | | | | | | | 5/3/11 6:00 PM | 29,999 | 6/13/11 6:00 PM | 15,604 | | | | | | | | | | | 11/28/11 9:00 AM | 24,826 |
| | | | | | | | 5/3/11 7:00 PM | 29,861 | 6/13/11 7:00 PM | 15,601 | | | | | | | | | | | 11/28/11 10:00 AM | 24,771 |
| | | | | | | | 5/3/11 8:00 PM | 35,840 | 6/13/11 8:00 PM | 15,589 | | | | | | | | | | | | |
| | | | | | | | 5/3/11 9:00 PM | 43,010 | 6/13/11 9:00 PM | 15,645 | | | | | | | | | | | | |
| | | | | | | | 5/3/11 10:00 PM | 31,840 | 6/13/11 10:00 PM | 15,607 | | | | | | | | | | | | |
| | | | | | | | 5/3/11 11:00 PM | 31,918 | 6/13/11 11:00 PM | 15,695 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 12:00 AM | 31,394 | 6/14/11 12:00 AM | 15,682 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 1:00 AM | 37,698 | 6/14/11 1:00 AM | 17,037 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 2:00 AM | 42,843 | 6/14/11 2:00 AM | 17,965 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 3:00 AM | 44,572 | 6/14/11 3:00 AM | 17,991 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 4:00 AM | 38,832 | 6/14/11 4:00 AM | 17,893 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 5:00 AM | 36,095 | 6/14/11 5:00 AM | 17,683 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 6:00 AM | 36,497 | 6/14/11 6:00 AM | 16,330 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 7:00 AM | 34,935 | 6/14/11 7:00 AM | 16,275 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 8:00 AM | 33,652 | 6/14/11 8:00 AM | 18,877 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 9:00 AM | 32,812 | 6/14/11 9:00 AM | 18,215 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 10:00 AM | 34,827 | 6/14/11 10:00 AM | 18,018 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 11:00 AM | 35,679 | 6/14/11 11:00 AM | 15,660 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 12:00 PM | 35,855 | 6/14/11 12:00 PM | 14,192 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 1:00 PM | 36,021 | 6/14/11 1:00 PM | 14,173 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 2:00 PM | 34,350 | 6/14/11 2:00 PM | 14,151 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 3:00 PM | 31,557 | 6/14/11 3:00 PM | 14,157 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 4:00 PM | 26,800 | 6/14/11 4:00 PM | 14,142 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 5:00 PM | 28,867 | 6/14/11 5:00 PM | 14,157 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 6:00 PM | 27,963 | 6/14/11 6:00 PM | 14,204 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 7:00 PM | 28,323 | 6/14/11 7:00 PM | 14,154 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 8:00 PM | 27,760 | 6/14/11 8:00 PM | 14,149 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 9:00 PM | 28,783 | 6/14/11 9:00 PM | 14,157 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 10:00 PM | 30,660 | 6/14/11 10:00 PM | 14,125 | | | | | | | | | | | | |
| | | | | | | | 5/4/11 11:00 PM | 36,254 | 6/14/11 11:00 PM | 14,116 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 12:00 AM | 35,820 | 6/15/11 12:00 AM | 14,135 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 1:00 AM | 34,745 | 6/15/11 1:00 AM | 14,104 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 2:00 AM | 36,348 | 6/15/11 2:00 AM | 14,146 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 3:00 AM | 36,931 | 6/15/11 3:00 AM | 14,115 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 4:00 AM | 37,378 | 6/15/11 4:00 AM | 14,200 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 5:00 AM | 37,019 | 6/15/11 5:00 AM | 14,193 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 6:00 AM | 36,530 | 6/15/11 6:00 AM | 14,166 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 7:00 AM | 37,876 | 6/15/11 7:00 AM | 14,150 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 8:00 AM | 39,335 | 6/15/11 8:00 AM | 14,149 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 9:00 AM | 39,944 | 6/15/11 9:00 AM | 14,185 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 10:00 AM | 39,761 | 6/15/11 10:00 AM | 12,732 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 11:00 AM | 38,560 | 6/15/11 11:00 AM | 13,423 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 12:00 PM | 34,912 | 6/15/11 12:00 PM | 27,866 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 1:00 PM | 36,006 | 6/15/11 1:00 PM | 24,981 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 2:00 PM | 34,397 | 6/15/11 2:00 PM | 23,970 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 3:00 PM | 31,256 | 6/15/11 3:00 PM | 23,794 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 4:00 PM | 30,871 | 6/15/11 4:00 PM | 23,545 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 5:00 PM | 30,043 | 6/15/11 5:00 PM | 23,349 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 6:00 PM | 30,097 | 6/15/11 6:00 PM | 14,380 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 7:00 PM | 32,014 | 6/15/11 7:00 PM | 14,550 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 8:00 PM | 33,371 | 6/15/11 8:00 PM | 16,123 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 9:00 PM | 33,176 | 6/15/11 9:00 PM | 18,243 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 10:00 PM | 33,510 | 6/15/11 10:00 PM | 19,483 | | | | | | | | | | | | |
| | | | | | | | 5/5/11 11:00 PM | 32,937 | 6/15/11 11:00 PM | 19,254 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 12:00 AM | 31,384 | 6/16/11 12:00 AM | 18,122 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 1:00 AM | 24,507 | 6/16/11 1:00 AM | 18,929 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 2:00 AM | 22,840 | 6/16/11 2:00 AM | 19,661 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 3:00 AM | 26,179 | 6/16/11 3:00 AM | 19,717 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 4:00 AM | 27,101 | 6/16/11 4:00 AM | 4,095 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 5:00 AM | 26,694 | 6/16/11 5:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 6:00 AM | 26,741 | 6/16/11 6:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 7:00 AM | 26,660 | 6/16/11 7:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 8:00 AM | 26,631 | 6/16/11 8:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 9:00 AM | 26,612 | 6/16/11 9:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 10:00 AM | 26,851 | 6/16/11 10:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 11:00 AM | 26,615 | 6/16/11 11:00 AM | 72 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 12:00 PM | 26,636 | 6/16/11 12:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 1:00 PM | 26,665 | 6/16/11 1:00 PM | 0 | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | | | | | | | 5/6/11 2:00 PM | 26,582 | 6/16/11 2:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 3:00 PM | 26,551 | 6/16/11 3:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 4:00 PM | 26,633 | 6/16/11 4:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 5:00 PM | 26,708 | 6/16/11 5:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 6:00 PM | 28,276 | 6/16/11 6:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 7:00 PM | 30,976 | 6/16/11 7:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 8:00 PM | 32,633 | 6/16/11 8:00 PM | 3,839 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 9:00 PM | 32,525 | 6/16/11 9:00 PM | 23,399 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 10:00 PM | 32,658 | 6/16/11 10:00 PM | 23,889 | | | | | | | | | | | | |
| | | | | | | | 5/6/11 11:00 PM | 32,047 | 6/16/11 11:00 PM | 23,489 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 12:00 AM | 31,627 | 6/17/11 12:00 AM | 23,481 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 1:00 AM | 30,780 | 6/17/11 1:00 AM | 23,536 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 2:00 AM | 30,432 | 6/17/11 2:00 AM | 23,663 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 3:00 AM | 30,462 | 6/17/11 3:00 AM | 23,562 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 4:00 AM | 30,927 | 6/17/11 4:00 AM | 26,222 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 5:00 AM | 37,992 | 6/17/11 5:00 AM | 29,102 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 6:00 AM | 37,788 | 6/17/11 6:00 AM | 19,854 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 7:00 AM | 37,735 | 6/17/11 7:00 AM | 29,612 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 8:00 AM | 37,735 | 6/17/11 8:00 AM | 28,437 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 9:00 AM | 37,780 | 6/17/11 9:00 AM | 30,315 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 10:00 AM | 37,668 | 6/17/11 10:00 AM | 29,699 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 11:00 AM | 16,695 | 6/17/11 11:00 AM | 26,211 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 12:00 PM | 14,749 | 6/17/11 12:00 PM | 19,061 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 1:00 PM | 17,155 | 6/17/11 1:00 PM | 18,892 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 2:00 PM | 18,109 | 6/17/11 2:00 PM | 18,884 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 3:00 PM | 18,111 | 6/17/11 3:00 PM | 18,861 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 4:00 PM | 18,094 | 6/17/11 4:00 PM | 18,873 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 5:00 PM | 18,153 | 6/17/11 5:00 PM | 18,885 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 6:00 PM | 18,157 | 6/17/11 6:00 PM | 18,830 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 7:00 PM | 18,158 | 6/17/11 7:00 PM | 18,904 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 8:00 PM | 18,133 | 6/17/11 8:00 PM | 18,877 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 9:00 PM | 18,120 | 6/17/11 9:00 PM | 18,872 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 10:00 PM | 18,654 | 6/17/11 10:00 PM | 18,836 | | | | | | | | | | | | |
| | | | | | | | 5/7/11 11:00 PM | 19,135 | 6/17/11 11:00 PM | 18,806 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 12:00 AM | 19,088 | 6/18/11 12:00 AM | 18,891 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 1:00 AM | 19,032 | 6/18/11 1:00 AM | 18,245 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 2:00 AM | 18,978 | 6/18/11 2:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 3:00 AM | 19,203 | 6/18/11 3:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 4:00 AM | 21,468 | 6/18/11 4:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 5:00 AM | 23,220 | 6/18/11 5:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 6:00 AM | 23,332 | 6/18/11 6:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 7:00 AM | 23,388 | 6/18/11 7:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 8:00 AM | 23,421 | 6/18/11 8:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 9:00 AM | 23,629 | 6/18/11 9:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 10:00 AM | 23,493 | 6/18/11 10:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 11:00 AM | 21,456 | 6/18/11 11:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 12:00 PM | 18,805 | 6/18/11 12:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 1:00 PM | 18,655 | 6/18/11 1:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 2:00 PM | 18,443 | 6/18/11 2:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 3:00 PM | 18,055 | 6/18/11 3:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 4:00 PM | 16,099 | 6/18/11 4:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 5:00 PM | 15,175 | 6/18/11 5:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 6:00 PM | 15,338 | 6/18/11 6:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 7:00 PM | 15,790 | 6/18/11 7:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 8:00 PM | 15,260 | 6/18/11 8:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 9:00 PM | 14,870 | 6/18/11 9:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 10:00 PM | 14,425 | 6/18/11 10:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/8/11 11:00 PM | 13,526 | 6/18/11 11:00 PM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 12:00 AM | 12,486 | 6/19/11 12:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 1:00 AM | 11,912 | 6/19/11 1:00 AM | 1,184 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 2:00 AM | 11,886 | 6/19/11 2:00 AM | 16,768 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 3:00 AM | 14,571 | 6/19/11 3:00 AM | 16,480 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 4:00 AM | 17,144 | 6/19/11 4:00 AM | 17,124 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 5:00 AM | 37,139 | 6/19/11 5:00 AM | 19,780 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 6:00 AM | 34,222 | 6/19/11 6:00 AM | 18,896 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 7:00 AM | 32,669 | 6/19/11 7:00 AM | 18,295 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 8:00 AM | 32,359 | 6/19/11 8:00 AM | 16,677 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 9:00 AM | 31,193 | 6/19/11 9:00 AM | 14,647 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 10:00 AM | 30,668 | 6/19/11 10:00 AM | 12,636 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 11:00 AM | 26,289 | 6/19/11 11:00 AM | 11,550 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 12:00 PM | 21,355 | 6/19/11 12:00 PM | 14,567 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 1:00 PM | 20,376 | 6/19/11 1:00 PM | 12,666 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 2:00 PM | 20,568 | 6/19/11 2:00 PM | 11,384 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 3:00 PM | 21,276 | 6/19/11 3:00 PM | 11,343 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 4:00 PM | 22,590 | 6/19/11 4:00 PM | 11,350 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 5:00 PM | 22,619 | 6/19/11 5:00 PM | 11,322 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 6:00 PM | 22,624 | 6/19/11 6:00 PM | 11,374 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 7:00 PM | 22,610 | 6/19/11 7:00 PM | 11,327 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 8:00 PM | 20,695 | 6/19/11 8:00 PM | 11,328 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 9:00 PM | 20,191 | 6/19/11 9:00 PM | 11,321 | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | | | | | | | 5/9/11 10:00 PM | 20,205 | 6/19/11 10:00 PM | 11,294 | | | | | | | | | | | | |
| | | | | | | | 5/9/11 11:00 PM | 20,203 | 6/19/11 11:00 PM | 11,334 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 12:00 AM | 20,205 | 6/20/11 12:00 AM | 11,292 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 1:00 AM | 20,215 | 6/20/11 1:00 AM | 11,301 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 2:00 AM | 20,196 | 6/20/11 2:00 AM | 11,354 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 3:00 AM | 20,228 | 6/20/11 3:00 AM | 11,332 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 4:00 AM | 21,181 | 6/20/11 4:00 AM | 11,357 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 5:00 AM | 25,274 | 6/20/11 5:00 AM | 8,664 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 6:00 AM | 25,264 | 6/20/11 6:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 7:00 AM | 25,270 | 6/20/11 7:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 8:00 AM | 25,230 | 6/20/11 8:00 AM | 0 | | | | | | | | | | | | |
| | | | | | | | 5/10/11 9:00 AM | 25,225 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 10:00 AM | 25,220 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 11:00 AM | 20,497 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 12:00 PM | 17,436 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 1:00 PM | 17,353 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 2:00 PM | 17,386 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 3:00 PM | 17,398 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 4:00 PM | 17,381 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 5:00 PM | 17,368 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 6:00 PM | 17,335 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 7:00 PM | 15,816 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 8:00 PM | 14,903 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 9:00 PM | 14,927 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 10:00 PM | 14,924 | | | | | | | | | | | | | | |
| | | | | | | | 5/10/11 11:00 PM | 14,947 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 12:00 AM | 15,366 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 1:00 AM | 16,054 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 2:00 AM | 16,040 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 3:00 AM | 16,070 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 4:00 AM | 17,302 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 5:00 AM | 18,837 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 6:00 AM | 18,869 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 7:00 AM | 18,842 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 8:00 AM | 18,874 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 9:00 AM | 18,908 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 10:00 AM | 18,314 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 11:00 AM | 20,136 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 12:00 PM | 24,500 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 1:00 PM | 30,019 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 2:00 PM | 39,369 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 3:00 PM | 39,882 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 4:00 PM | 38,668 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 5:00 PM | 36,625 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 6:00 PM | -28 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 7:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 8:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 9:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 10:00 PM | -4,503 | | | | | | | | | | | | | | |
| | | | | | | | 5/11/11 11:00 PM | -4,198 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 12:00 AM | -4,135 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 1:00 AM | -4,084 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 2:00 AM | -2,102 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 3:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 4:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 5:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 6:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 7:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 8:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 9:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 10:00 AM | 9,914 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 11:00 AM | 43,154 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 12:00 PM | 39,970 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 1:00 PM | 28,144 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 2:00 PM | 24,526 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 3:00 PM | 24,469 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 4:00 PM | 24,471 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 5:00 PM | 24,503 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 6:00 PM | 24,568 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 7:00 PM | 8,632 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 8:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 9:00 PM | -239 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 10:00 PM | -4,428 | | | | | | | | | | | | | | |
| | | | | | | | 5/12/11 11:00 PM | -4,169 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 12:00 AM | -4,125 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 1:00 AM | -3,933 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 2:00 AM | -878 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 3:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 4:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 5:00 AM | 0 | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | | | | | | | 5/13/11 6:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 7:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 8:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 9:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 10:00 AM | -239 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 11:00 AM | 15,693 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 12:00 PM | 37,621 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 1:00 PM | 37,708 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 2:00 PM | 37,709 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 3:00 PM | 37,600 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 4:00 PM | 37,052 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 5:00 PM | 36,028 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 6:00 PM | 30,382 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 7:00 PM | -23 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 8:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 9:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 10:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/13/11 11:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 12:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 1:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 2:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 3:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 4:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 5:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 6:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 7:00 AM | -90 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 8:00 AM | -3,143 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 9:00 AM | -6,741 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 10:00 AM | -7,538 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 11:00 AM | -7,303 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 12:00 PM | -4,824 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 1:00 PM | -2,666 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 2:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 3:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 4:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 5:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 6:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 7:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 8:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 9:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 10:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/14/11 11:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 12:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 1:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 2:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 3:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 4:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 5:00 AM | 19,969 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 6:00 AM | 28,149 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 7:00 AM | 28,248 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 8:00 AM | 28,261 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 9:00 AM | 28,264 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 10:00 AM | 28,253 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 11:00 AM | 19,012 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 12:00 PM | 22,656 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 1:00 PM | 24,544 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 2:00 PM | 24,511 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 3:00 PM | 24,567 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 4:00 PM | 24,538 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 5:00 PM | 24,605 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 6:00 PM | 24,509 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 7:00 PM | 23,614 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 8:00 PM | 22,701 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 9:00 PM | 22,631 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 10:00 PM | 22,628 | | | | | | | | | | | | | | |
| | | | | | | | 5/15/11 11:00 PM | 22,646 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 12:00 AM | 22,655 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 1:00 AM | 24,110 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 2:00 AM | 24,519 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 3:00 AM | 24,523 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 4:00 AM | 24,865 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 5:00 AM | 25,112 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 6:00 AM | 25,066 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 7:00 AM | 25,080 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 8:00 AM | 25,153 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 9:00 AM | 25,133 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 10:00 AM | 25,107 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 11:00 AM | 28,657 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 12:00 PM | 31,321 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 1:00 PM | 33,055 | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | | | | | | | 5/16/11 2:00 PM | 33,201 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 3:00 PM | 33,705 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 4:00 PM | 34,057 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 5:00 PM | 34,010 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 6:00 PM | 34,036 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 7:00 PM | 34,032 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 8:00 PM | 38,920 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 9:00 PM | 39,274 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 10:00 PM | 39,294 | | | | | | | | | | | | | | |
| | | | | | | | 5/16/11 11:00 PM | 39,230 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 12:00 AM | 40,988 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 1:00 AM | 42,112 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 2:00 AM | 42,074 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 3:00 AM | 42,133 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 4:00 AM | 43,225 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 5:00 AM | 43,553 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 6:00 AM | 42,679 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 7:00 AM | 41,413 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 8:00 AM | 40,712 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 9:00 AM | 40,955 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 10:00 AM | 40,388 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 11:00 AM | 29,752 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 12:00 PM | 27,166 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 1:00 PM | 29,468 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 2:00 PM | 29,472 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 3:00 PM | 29,490 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 4:00 PM | 29,521 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 5:00 PM | 29,474 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 6:00 PM | 29,509 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 7:00 PM | 29,664 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 8:00 PM | 30,182 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 9:00 PM | 30,200 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 10:00 PM | 30,139 | | | | | | | | | | | | | | |
| | | | | | | | 5/17/11 11:00 PM | 30,155 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 12:00 AM | 30,159 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 1:00 AM | 30,184 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 2:00 AM | 30,229 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 3:00 AM | 30,256 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 4:00 AM | 32,848 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 5:00 AM | 34,929 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 6:00 AM | 33,808 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 7:00 AM | 27,126 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 8:00 AM | 26,516 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 9:00 AM | 26,494 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 10:00 AM | 26,472 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 11:00 AM | 26,467 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 12:00 PM | 23,489 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 1:00 PM | 22,659 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 2:00 PM | 22,630 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 3:00 PM | 22,654 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 4:00 PM | 22,636 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 5:00 PM | 22,662 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 6:00 PM | 22,673 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 7:00 PM | 22,683 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 8:00 PM | 22,732 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 9:00 PM | 22,635 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 10:00 PM | 22,636 | | | | | | | | | | | | | | |
| | | | | | | | 5/18/11 11:00 PM | 22,609 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 12:00 AM | 22,634 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 1:00 AM | 18,931 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 2:00 AM | 17,527 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 3:00 AM | 17,522 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 4:00 AM | 17,531 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 5:00 AM | 17,540 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 6:00 AM | 17,564 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 7:00 AM | 17,548 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 8:00 AM | 17,535 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 9:00 AM | 17,551 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 10:00 AM | 17,499 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 11:00 AM | 17,525 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 12:00 PM | 18,329 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 1:00 PM | 20,764 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 2:00 PM | 20,844 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 3:00 PM | 20,805 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 4:00 PM | 20,794 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 5:00 PM | 20,781 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 6:00 PM | 21,656 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 7:00 PM | 22,284 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 8:00 PM | 23,157 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 9:00 PM | 23,093 | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | | | | | | | 5/19/11 10:00 PM | 22,451 | | | | | | | | | | | | | | |
| | | | | | | | 5/19/11 11:00 PM | 21,333 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 12:00 AM | 20,472 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 1:00 AM | 14,111 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 2:00 AM | 14,317 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 3:00 AM | 14,181 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 4:00 AM | 14,161 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 5:00 AM | 16,274 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 6:00 AM | 17,120 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 7:00 AM | 17,342 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 8:00 AM | 15,801 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 9:00 AM | 18,271 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 10:00 AM | 17,011 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 11:00 AM | 16,269 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 12:00 PM | 14,739 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 1:00 PM | 11,518 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 2:00 PM | 24,497 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 3:00 PM | 20,801 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 4:00 PM | 20,710 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 5:00 PM | 20,754 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 6:00 PM | 20,745 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 7:00 PM | 20,754 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 8:00 PM | 20,752 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 9:00 PM | 20,749 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 10:00 PM | 20,958 | | | | | | | | | | | | | | |
| | | | | | | | 5/20/11 11:00 PM | 21,141 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 12:00 AM | 21,148 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 1:00 AM | 21,171 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 2:00 AM | 21,148 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 3:00 AM | 21,150 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 4:00 AM | 21,124 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 5:00 AM | 21,131 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 6:00 AM | 21,117 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 7:00 AM | 21,084 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 8:00 AM | 21,063 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 9:00 AM | 21,098 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 10:00 AM | 21,096 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 11:00 AM | 21,116 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 12:00 PM | 21,102 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 1:00 PM | 21,147 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 2:00 PM | 21,157 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 3:00 PM | 21,151 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 4:00 PM | 21,163 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 5:00 PM | 21,141 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 6:00 PM | 21,123 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 7:00 PM | 21,117 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 8:00 PM | 21,100 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 9:00 PM | 21,117 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 10:00 PM | 21,117 | | | | | | | | | | | | | | |
| | | | | | | | 5/21/11 11:00 PM | 21,137 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 12:00 AM | 21,157 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 1:00 AM | 21,162 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 2:00 AM | 21,150 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 3:00 AM | 21,132 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 4:00 AM | 21,117 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 5:00 AM | 21,124 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 6:00 AM | 4,229 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 7:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 8:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 9:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 10:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 11:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 12:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 1:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 2:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 3:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 4:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 5:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 6:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 7:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 8:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 9:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 10:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/22/11 11:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 12:00 AM | 18,061 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 1:00 AM | 23,158 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 2:00 AM | 19,526 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 3:00 AM | 18,741 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 4:00 AM | 18,855 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 5:00 AM | 22,399 | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | | | | | | | 5/23/11 6:00 AM | 23,521 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 7:00 AM | 23,499 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 8:00 AM | 23,579 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 9:00 AM | 23,596 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 10:00 AM | 23,554 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 11:00 AM | 23,560 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 12:00 PM | 23,585 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 1:00 PM | 23,587 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 2:00 PM | 23,576 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 3:00 PM | 23,569 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 4:00 PM | 23,608 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 5:00 PM | 23,549 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 6:00 PM | 23,534 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 7:00 PM | 23,577 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 8:00 PM | 23,626 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 9:00 PM | 23,596 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 10:00 PM | 23,649 | | | | | | | | | | | | | | |
| | | | | | | | 5/23/11 11:00 PM | 23,618 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 12:00 AM | 23,633 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 1:00 AM | 23,594 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 2:00 AM | 4,446 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 3:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 4:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 5:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 6:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 7:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 8:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 9:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 10:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 11:00 AM | -171 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 12:00 PM | 16,294 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 1:00 PM | 24,652 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 2:00 PM | 24,691 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 3:00 PM | 24,685 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 4:00 PM | 24,721 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 5:00 PM | 24,703 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 6:00 PM | 24,761 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 7:00 PM | 24,741 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 8:00 PM | 24,853 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 9:00 PM | 24,909 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 10:00 PM | 24,898 | | | | | | | | | | | | | | |
| | | | | | | | 5/24/11 11:00 PM | 24,930 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 12:00 AM | 24,943 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 1:00 AM | 24,941 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 2:00 AM | 24,880 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 3:00 AM | 24,935 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 4:00 AM | 24,907 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 5:00 AM | 24,894 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 6:00 AM | 24,892 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 7:00 AM | 24,904 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 8:00 AM | 24,904 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 9:00 AM | 24,906 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 10:00 AM | 24,952 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 11:00 AM | 22,386 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 12:00 PM | 20,753 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 1:00 PM | 20,772 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 2:00 PM | 20,732 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 3:00 PM | 20,752 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 4:00 PM | 20,780 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 5:00 PM | 20,776 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 6:00 PM | 20,762 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 7:00 PM | 20,762 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 8:00 PM | 20,751 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 9:00 PM | 20,145 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 10:00 PM | 17,614 | | | | | | | | | | | | | | |
| | | | | | | | 5/25/11 11:00 PM | 17,576 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 12:00 AM | 17,541 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 1:00 AM | 17,586 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 2:00 AM | 17,548 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 3:00 AM | 17,568 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 4:00 AM | 17,547 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 5:00 AM | 18,732 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 6:00 AM | 19,220 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 7:00 AM | 19,212 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 8:00 AM | 19,245 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 9:00 AM | 19,230 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 10:00 AM | 19,474 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 11:00 AM | 21,306 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 12:00 PM | 25,490 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 1:00 PM | 25,563 | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | | | | | | | 5/26/11 2:00 PM | 20,414 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 3:00 PM | 18,260 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 4:00 PM | 16,975 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 5:00 PM | 16,978 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 6:00 PM | 16,990 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 7:00 PM | 16,973 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 8:00 PM | 18,174 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 9:00 PM | 18,494 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 10:00 PM | 18,532 | | | | | | | | | | | | | | |
| | | | | | | | 5/26/11 11:00 PM | 18,503 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 12:00 AM | 18,469 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 1:00 AM | 18,488 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 2:00 AM | 18,501 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 3:00 AM | 18,493 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 4:00 AM | 18,494 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 5:00 AM | 26,177 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 6:00 AM | 26,193 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 7:00 AM | 26,187 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 8:00 AM | 26,202 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 9:00 AM | 26,278 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 10:00 AM | 37,196 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 11:00 AM | 25,837 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 12:00 PM | 18,935 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 1:00 PM | 18,912 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 2:00 PM | 18,928 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 3:00 PM | 18,893 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 4:00 PM | 18,877 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 5:00 PM | 18,877 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 6:00 PM | 20,803 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 7:00 PM | 29,643 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 8:00 PM | 29,593 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 9:00 PM | 29,647 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 10:00 PM | 29,624 | | | | | | | | | | | | | | |
| | | | | | | | 5/27/11 11:00 PM | 29,617 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 12:00 AM | 29,440 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 1:00 AM | 27,961 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 2:00 AM | 27,035 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 3:00 AM | 16,742 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 4:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 5:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 6:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 7:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 8:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 9:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 10:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 11:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 12:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 1:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 2:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 3:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 4:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 5:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 6:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 7:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 8:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 9:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 10:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/28/11 11:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 12:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 1:00 AM | -135 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 2:00 AM | 13,692 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 3:00 AM | 21,105 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 4:00 AM | 21,755 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 5:00 AM | 26,009 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 6:00 AM | 25,961 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 7:00 AM | 26,063 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 8:00 AM | 26,016 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 9:00 AM | 26,044 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 10:00 AM | 26,048 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 11:00 AM | 26,004 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 12:00 PM | 26,017 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 1:00 PM | 26,014 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 2:00 PM | 26,020 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 3:00 PM | 26,006 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 4:00 PM | 26,046 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 5:00 PM | 26,030 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 6:00 PM | 26,031 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 7:00 PM | 26,022 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 8:00 PM | 26,033 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 9:00 PM | 26,026 | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | | | | | | | 5/29/11 10:00 PM | 15,875 | | | | | | | | | | | | | | |
| | | | | | | | 5/29/11 11:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 12:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 1:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 2:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 3:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 4:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 5:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 6:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 7:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 8:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 9:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 10:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 11:00 AM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 12:00 PM | 0 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 1:00 PM | 1,626 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 2:00 PM | 19,042 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 3:00 PM | 18,121 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 4:00 PM | 18,137 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 5:00 PM | 18,006 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 6:00 PM | 18,046 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 7:00 PM | 18,389 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 8:00 PM | 19,447 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 9:00 PM | 18,577 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 10:00 PM | 17,957 | | | | | | | | | | | | | | |
| | | | | | | | 5/30/11 11:00 PM | 17,314 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 12:00 AM | 18,898 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 1:00 AM | 26,697 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 2:00 AM | 24,967 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 3:00 AM | 25,048 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 4:00 AM | 25,931 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 5:00 AM | 22,799 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 6:00 AM | 23,710 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 7:00 AM | 26,672 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 8:00 AM | 26,725 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 9:00 AM | 26,632 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 10:00 AM | 26,638 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 11:00 AM | 26,242 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 12:00 PM | 15,242 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 1:00 PM | 15,128 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 2:00 PM | 15,130 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 3:00 PM | 15,367 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 4:00 PM | 16,375 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 5:00 PM | 16,598 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 6:00 PM | 15,882 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 7:00 PM | 19,172 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 8:00 PM | 24,676 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 9:00 PM | 24,623 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 10:00 PM | 24,713 | | | | | | | | | | | | | | |
| | | | | | | | 5/31/11 11:00 PM | 24,698 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 12:00 AM | 25,353 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 1:00 AM | 26,687 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 2:00 AM | 26,753 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 3:00 AM | 26,854 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 4:00 AM | 26,821 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 5:00 AM | 26,842 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 6:00 AM | 26,851 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 7:00 AM | 26,831 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 8:00 AM | 26,836 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 9:00 AM | 26,811 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 10:00 AM | 26,814 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 11:00 AM | 26,778 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 12:00 PM | 26,795 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 1:00 PM | 22,702 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 2:00 PM | 22,061 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 3:00 PM | 22,085 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 4:00 PM | 22,070 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 5:00 PM | 22,070 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 6:00 PM | 22,087 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 7:00 PM | 22,095 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 8:00 PM | 22,095 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 9:00 PM | 22,089 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 10:00 PM | 22,103 | | | | | | | | | | | | | | |
| | | | | | | | 6/1/11 11:00 PM | 22,122 | | | | | | | | | | | | | | |
| | | | | | | | 6/2/11 12:00 AM | 22,109 | | | | | | | | | | | | | | |
| | | | | | | | 6/2/11 1:00 AM | 22,093 | | | | | | | | | | | | | | |
| | | | | | | | 6/2/11 2:00 AM | 22,113 | | | | | | | | | | | | | | |
| | | | | | | | 6/2/11 3:00 AM | 22,118 | | | | | | | | | | | | | | |
| | | | | | | | 6/2/11 4:00 AM | 22,067 | | | | | | | | | | | | | | |
| | | | | | | | 6/2/11 5:00 AM | 22,136 | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Date | 1/26/11 9:30 AM | | 2/1/11 2:00 PM | | 3/8/11 11:30 AM | | 5/3/11 8:00 AM | | 6/13/11 8:00 AM | | 6/27/11 8:00 AM | | 6/28/11 10:00 AM | | 6/29/11 8:00 AM | | 6/30/11 2:00 PM | | 9/29/11 8:00 AM | | 11/27/11 10:00 PM | |
| End Date | 1/26/11 3:00 PM | | 2/1/11 9:00 PM | | 3/8/11 12:30 PM | | 6/2/11 8:00 AM | | 6/20/11 8:30 AM | | 6/27/11 12:00 PM | | 6/28/11 4:30 PM | | 6/29/11 12:00 PM | | 6/30/11 4:00 PM | | 9/29/11 12:00 PM | | 11/28/11 10:00 AM | |
| Hours | 5.5 | | 7 | | 1 | | 720 | | 168.5 | | 4 | | 6.5 | | 4 | | 2 | | 4 | | 12 | |
| Plant | Parkway B | | Parkway B | | Parkway B | | Parkway B | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | | Parkway A | |
| Type | Scheduled | | Unscheduled | | Unscheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Scheduled | | Unscheduled | | Scheduled | | Unscheduled | |
| Description | 1000 hour inspection | | Unscheduled | | Shut Down | | Post Op Inspections | | Hot end inspection | | 750 hour inspection | | Technical Maintenace | | 750 hour inspection | | High Discharge Temp | | 750 hour inspection | | Thermal Couple Replacement | |
| | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** | **Time** | **Flow (GJs)** |
| | | | | | | | 6/2/11 6:00 AM | 22,096 | | | | | | | | | | | | | | |
| | | | | | | | 6/2/11 7:00 AM | 22,031 | | | | | | | | | | | | | | |
| | | | | | | | 6/2/11 8:00 AM | 22,069 | | | | | | | | | | | | | | |

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pg 3 of 6 line 6 through to pg 4 of 6 line 5
Exhibit B1, Tab 9, Schedule 2
Exhibit B1, Tab 9, pg 1
Exhibit B1, Tab 9, pg 3, line 19

Preamble: TransCanada wishes to better understand the development of the existing Dawn to Parkway system design and the rationale for changing the system design.

a) For each of the past ten years (2001-2012), please provide the extent (both absolute as to capabilities vs. requirements and as a percentage of requirements) of Parkway LCU coverage that Union has had for deliveries to TransCanada at Parkway.

b) Please describe in detail the facilities that provide or provided the LCU coverage identified in the response to (a).

c) Please provide schematics that support the response to (a) and represent the facilities described in (b) for each facilities configuration that has been in place over the past ten years, together with any other engineering data that support the responses.

d) For each of the Parkway A Unit and the Parkway B unit provide by month for the period from November 2006 to March 2012:

   i) the running hours of the unit;

   ii) the non-running hours when the unit was available but there was no demand for the unit;

   iii) the non-running hours when the unit was unavailable as a result of scheduled maintenance; and

   iv) the non-running hours when the unit was unavailable due to unscheduled issues.

e) Given the historical flows provided in reference (2), would Union describe any of the months from April 2011 to October 2011 as a "period of peak demand?" Why or why not, and if not, how would Union describe these months in terms of relative demand?

f) For each day in the past ten years that Union restricted firm deliveries to TransCanada at Parkway due to the loss of compression at Parkway please provide:

i) the date of the restriction;

ii) the Parkway compressor unit that was unavailable that day;

iii) any other pipe and/or compression facilities on the Dawn-Trafalgar System that were unavailable that day;

iv) the nominated firm deliveries to TransCanada at Parkway on that day;

v) the quantity of firm deliveries that were restricted on that day; and vi) the length of time required to fix the unit.

g) For each day in the past ten years that Union would have restricted firm deliveries at Parkway had it not been for the loss of critical unit protection for Dawn, Lobo and Bright compression please provide:

i) the date that the restriction would have occurred;

ii) the compressor unit that was unavailable that day;

iii) all other pipe and compression facilities on the Dawn-Trafalgar System that were in or out of service that day;

iv) the nominated firm deliveries on that day; and

v) the estimated quantity of firm deliveries that would have been restricted on that day if Union had not designed the system with loss of critical unit protection.

---

**Response:**

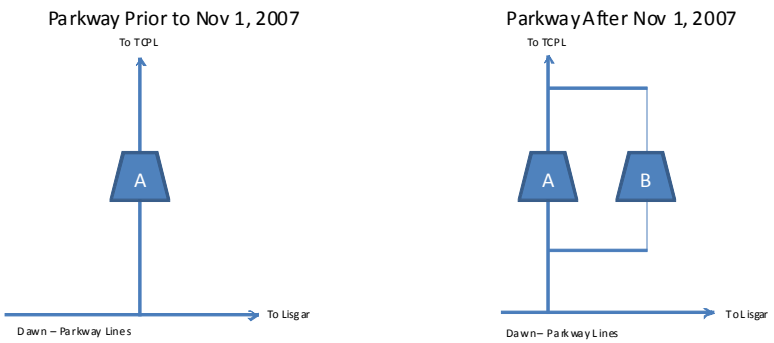
a) Prior to November 1, 2007 the only compression facilities available at parkway to discharge the contractual pressure requirement of 6450 kPa to TCPL was Parkway A. Since Parkway A was the only unit available, there was no LCU coverage available. Data prior to the installation of Parkway B is not relevant and has not been provided.

| Winter | Parkway Contracted Compressed Demands (TJ/d) | Parkway Obligated Deliveries (TJ/d) | Total Required Volume through Parkway Compression (TJ/d) | LCU Coverage Volume (TJ/d) | CU Coverage Percentage |
|---|---|---|---|---|---|
| 07/08 | 2096 | 762 | 1634 | 1112 | 73 |
| 08/09 | 2326 | 615 | 1711 | 1119 | 70 |
| 09/10 | 2422 | 599 | 1823 | 1220 | 72 |
| 10/11 | 2422 | 602 | 1820 | 1157 | 68 |
| 11/12 | 2577 | 658 | 1920 | 1228 | 68 |

b) The total required volume through Parkway compression is equivalent to the requirement less obligated deliveries. The LCU coverage assumes the loss of the largest compression unit (Parkway B). The required delivery pressure to TCPL at the Parkway discharge is 6450 kPa. The LCU coverage volume noted above considers design day conditions and would be contingent upon obligated deliveries, including direct purchase customers, arriving at Parkway and a sufficient level of non-facility capacity in place.

Since November 1, 2007 an additional compressor was constructed at Parkway known as the Parkway B compressor. Based on the principle of building standard blocks of horsepower, the Parkway B compressor provides horsepower that exceeds the requirements to meet current market demand at Parkway (TCPL). As a result, some LCU protection has been available, specifically in the event of a loss of Parkway A. As flow through Parkway increases, such as to serve the TCPL 2012 Eastern Mainline Expansion Project, the level of LCU protection afforded by the excess Parkway B horsepower will decrease. At a flow of 2.54 PJ/d, no LCU protection will exist at Parkway without the addition of compression.

c)



d) i-iv) Union has provided supply information back to January 1st, 2011. Providing data earlier than this would be onerous and in Union's view not relevant to setting rates for 2013.

**Parkway A**

| | | Running Hours (i) | Non-Running Hours - No Demand (ii) | Scheduled Maintenance Hours (iii) | Unscheduled Maintenance Hours (iv) |
|---|---|---|---|---|---|
| 2011 | Jan | 7 | 737 | 0 | 0 |
| | Feb | 116 | 556 | 0 | 0 |
| | Mar | 219 | 525 | 0 | 0 |
| | Apr | 351 | 369 | 0 | 0 |
| | May | 441 | 303 | 0 | 0 |
| | Jun | 375 | 160 | 183 | 2 |
| | Jul | 482 | 262 | 0 | 0 |
| | Aug | 20 | 724 | 0 | 0 |
| | Sep | 523 | 193 | 4 | 0 |
| | Oct | 551 | 193 | 0 | 0 |
| | Nov | 110 | 598 | 0 | 12 |
| | Dec | 104 | 640 | 0 | 0 |
| 2012 | Jan | 69 | 671 | 4 | 0 |
| | Feb | 22 | 674 | 0 | 0 |
| | Mar | 84 | 660 | 0 | 0 |

**Parkway B**

| | | Running Hours (i) | Non-Running Hours - No Demand (ii) | Scheduled Maintenance Hours (iii) | Unscheduled Maintenance Hours (iv) |
|---|---|---|---|---|---|
| 2011 | Jan | 699 | 39.5 | 5.5 | 0 |
| | Feb | 495 | 175 | 0 | 2 |
| | Mar | 264 | 479 | 0 | 1 |
| | Apr | 151 | 569 | 0 | 0 |
| | May | 1 | 23 | 720 | 0 |
| | Jun | 19 | 701 | 0 | 0 |
| | Jul | 29 | 711 | 4 | 0 |
| | Aug | 0 | 744 | 0 | 0 |
| | Sep | 5 | 715 | 0 | 0 |
| | Oct | 125 | 619 | 0 | 0 |
| | Nov | 281 | 439 | 0 | 0 |
| | Dec | 587 | 157 | 0 | 0 |
| 2012 | Jan | 625 | 94 | 25 | 0 |
| | Feb | 536 | 160 | 0 | 0 |
| | Mar | 338 | 406 | 0 | 0 |

e) Union's design day is modeled to occur between November 1st and March 31st. A summer design day model has not been developed. Demands at Parkway (TCPL) now require compression at Parkway throughout the April to October time frame.

f) Providing the detail would be onerous and in Union's view not relevant to setting rates for 2013. Union confirms that there have been no restricted firm deliveries to TCPL at Parkway due to a loss of compression since January 1, 2011.

g) Providing the detail would be onerous and in Union's view not relevant to setting rates for 2013. Union confirms there have been no instances where it would have restricted firm deliveries at Parkway had it not been for the LCU protection for Dawn, Lobo and Bright compression since January 1, 2011.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pg 3
Exhibit B1, Tab 9, pg 1

Preamble: Union states that "Union has Loss of Critical Unit (LCU) protection for Dawn, Lobo and Bright compression which will protect gas flow along the Dawn to Parkway system."

a) Does Union identify specific facilities as providing "Loss of Critical Unit (LCU) protection at Dawn, Lobo and Bright." If so please explain how each facility provides LCU protection.

b) Please provide the estimated total gross capital and annual owning and operating costs of the facilities identified in (a).

c) Please provide the number of times that those LCU protection facilities have been required due to a loss of critical unit during the past 10 years.

d) Please provide the number of days that the LCU protection facilities were required for each of the events listed in c) above.

---

**Response:**

a) Union identifies one LCU compressor at Dawn and one LCU compressor between Lobo and Bright. The LCU compressor at Dawn has to provide sufficient flow to cover the loss of any other unit. The Dawn LCU compressor is Plant G. Plant G provides LCU coverage for both storage and transmission compression.

The LCU compressor on the Dawn-Parkway system will cover the loss of a single compressor unit at either Lobo or Bright. The LCU compressor for the Dawn-Parkway system is Bright A1 or Lobo B, each being the largest horsepower unit at each site. The Dawn-Parkway system is designed to meet all firm demand with a loss of one unit at Dawn and a loss of one unit at either Lobo or Bright, whichever one results in the lowest system capacity. Under the current forecast, the LCU compressor for Lobo and Bright is Lobo B.

At Dawn and Lobo/Bright, Union will use all of its facilities to meet delivery obligations in the most efficient manner while ensuring enough horsepower is held in reserve to cover LCU.

b)

| | Estimated Gross Capital Costs ($000's) | Estimated 2013 Revenue Requirement ($000's) |
|---|---|---|
| Dawn Plant G (regulated only) | $32,113 | $2,223 |
| Lobo B Plant | $57,132 | $5,095 |

c) Union is unable to provide information for the past 10 years. The LCU protection facilities identified have not been required to provide LCU protection since January 1, 2011.

d) Please see the response at c) above.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 5, pg 3, lines 1 - 12

Preamble: TransCanada wishes to better understand "non-facility capacity" and its role in avoiding the need for "facility capacity".

a) Please describe in detail what non-facility capacity is.

b) Please describe in detail how Union was able to react to operating restrictions at the Lobo Compressor Station by increasing the non-facility capacity to a "high level", as described in the referenced evidence, including the characteristics of the non-facility capacity and how it was acquired.

c) What factors caused the anticipated insufficiency in capability on the Dawn-Parkway system for the 2011-2012 winter, such that Union forecast, in the referenced evidence, the need for non-facility capability?

d) How did Union plan to acquire the 187,141 GJ/d of non-facility capacity for the 2011-2012 winter as described in the referenced evidence?

e) What cost did Union anticipate incurring to acquire the non-facility capacity described in (d)?

f) As matters transpired, was the capability of the Dawn-Parkway system insufficient to meet demand during the 2011-2012 winter?

g) If the capability of the Dawn-Parkway system was insufficient to meet demand during the 2011-2012 winter, what non-facility capacity was acquired? If any non-facility capacity was acquired, please provide the particulars as to its quantity, characteristics, costs and how it was acquired.

h) Please describe how Union could use non-facility capacity to mitigate operational restrictions at Parkway due to potential compression unit losses.

**Response:**

a) Non-facility capacity is supply acquired through various options and delivered to Parkway to off-set physical gas flow through the Dawn-Parkway system. The two major forms of non-facility capacity used by Union are Obligated Deliveries at Parkway and Winter Peaking Service ("WPS").

Please see the response at Exhibit J.D-18-9-1 a) for detail on Obligated Deliveries.

Union considers Obligated Deliveries as part of the base system design. As a result, Union has interpreted this question, and all parts below, as specific to WPS capacity purchased annually as needed.

WPS is a purchased service acquired from third parties to land gas at Parkway. These purchased services include but are not limited to Dawn to Parkway exchanges, TCPL STFT, parking gas at Parkway and acquiring third party Dawn to Parkway capacity.

b) In winter 2010/2011,Union acquired additional WPS through a combination of Dawn to Parkway exchanges, parking gas at Parkway and third party Dawn to Parkway capacity to meet its non-facility capacity requirements.

c) The need for non-facility capability has been the result of both in-franchise and ex-franchise growth on the Dawn-Parkway system. Union typically manages a level of non-facility capability and Union will construct facilities when appropriate. Due to forecast turnback on the Dawn-Kirkwall path, Union chose to manage the short-term increase in system shortfall with non-facility options. Since the construction of facilities creates "lumpy" additions of capacity, Union uses non-facility capacity to smooth out the need to construct.

d) Please see the response at part a) above for Union's plan to purchase WPS.

e) The anticipated cost was approximately $3.9 million (Cdn).

f) Based on the demand on the system WPS was not required.

g) Apart from Obligated Deliveries, no non-facility capacity was required.

h) Union does not consider non-facility capacity to be an option to replace an unscheduled loss of compression for the following reasons:

i) In addition to the extent that the loss of compression was unplanned there would not be enough time to source the non-facility capacity;
ii) The volume required to manage a potential loss of compression at Parkway is too large to mitigate using non-facility capacity;

iii) Union cannot be certain that the volumes required would be available in the marketplace to purchase at a reasonable cost;
iv) Attempting to acquire volumes of this magnitude would likely artificially inflate the cost of the non-facility capacity; and,
v) An outage of a compressor unit at Parkway could impact regional gas flow making physical delivery to Parkway and points east difficult.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pgs 4-5

Preamble: Union states that the Parkway West Project facilities are comprised of three components. Union explains part of these facilities as follows: "Union proposes to install a second metering and a header system connected to the Dawn to Parkway system that would allow continued supply to EGD in the event of an outage of the existing Dawn to Parkway system interconnection at Parkway (including the valve site)." Union also provides a schedule of capital expenditures from 2012 to 2014.

a) Is the "second metering and a header system connected to the Dawn to Parkway system that would allow continued supply to EGD in the event of an outage of the existing Dawn to Parkway system interconnection at Parkway (including the valve site)." required to provide LCU at Parkway (TCPL) discharge? If not, please describe the nature and cost of those proposed facilities that are not required to provide LCU at Parkway (TCPL) discharge.

b) Please provide the estimated annual owning and operating costs of the Parkway West Project facilities for the next 15 years:

   i) that will provide loss of critical unit protection for deliveries to TransCanada ; and
   ii) that will provide the second connection to EGD.

c) Please provide the proposed allocation of the costs provided in (b) to M12, M12-X and C1 customers as well as in-franchise customers, and the contractual underpinning for these facilities.

d) Please provide the effect that these costs will have on Rates M12, M12-X, and C1 for the following services (in cents/GJ at 100% LF) for the next 15 years:

   i) Dawn to Kirkwall
   ii) Dawn to Parkway
   iii) Kirkwall to Parkway
   iv) Parkway to Kirkwall
   v) Kirkwall to Dawn
   vi) Parkway to Dawn

e) Please provide a copy of each presentation that Union made to Enbridge Gas Distribution, Enbridge Inc., Spectra Energy, TransCanada and Union Senior Management or any other affected party, in which either element of the Parkway West Project is the topic or is among the topics discussed in the presentation.

---

**Response:**

a) Please see the response at Exhibit J.B-1-1-2 a).

b) The first full year operating cost for depreciation, allowed return and taxes for the Parkway West Project is estimated to be approximately $16.4 million.

c) The Parkway West Project is not included in Union's test year cost of service. The cost and rates consequences of the Parkway West Project will be dealt with in a subsequent proceeding.

d) i)-vi) Please see the response at c) above.

e) Attachments 1 – 6 are representative presentations including two presentations given to Spectra Energy Senior Management in April 2012 seeking preliminary approvals associated with the Parkway West Project (Attachments 1 and 2). Commercially and operationally sensitive material has been redacted from these presentations. Also attached are three presentations provided at – i) the IGUA LDC Forum in Toronto in November 2011, ii) the Union Gas Customer Meeting in Calgary in March 2012 and iii) the Canadian Institute's Ontario Power Perspectives conference in Toronto in April 2012 (Attachments 3, 4 and 5). In addition, attached is a presentation given to TCPL in October 2011 which is representative of the content in customer presentations regarding the Parkway West Project (Attachment 6).

# Parkway Projects

## *Parkway West Pre-spend Approval*

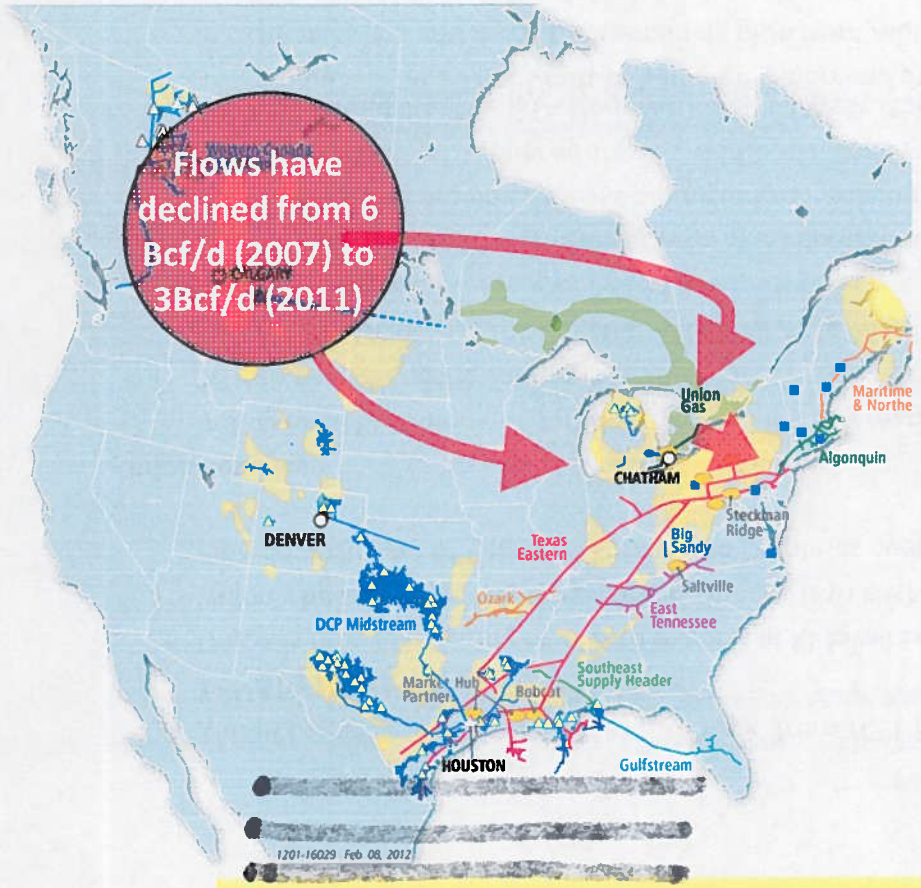
Doug Alexander – Director Engineering and Execution
Mark Isherwood – VP Business Development, Storage and Transmission
Jim Redford - Director, Business Development & Strategic Accounts

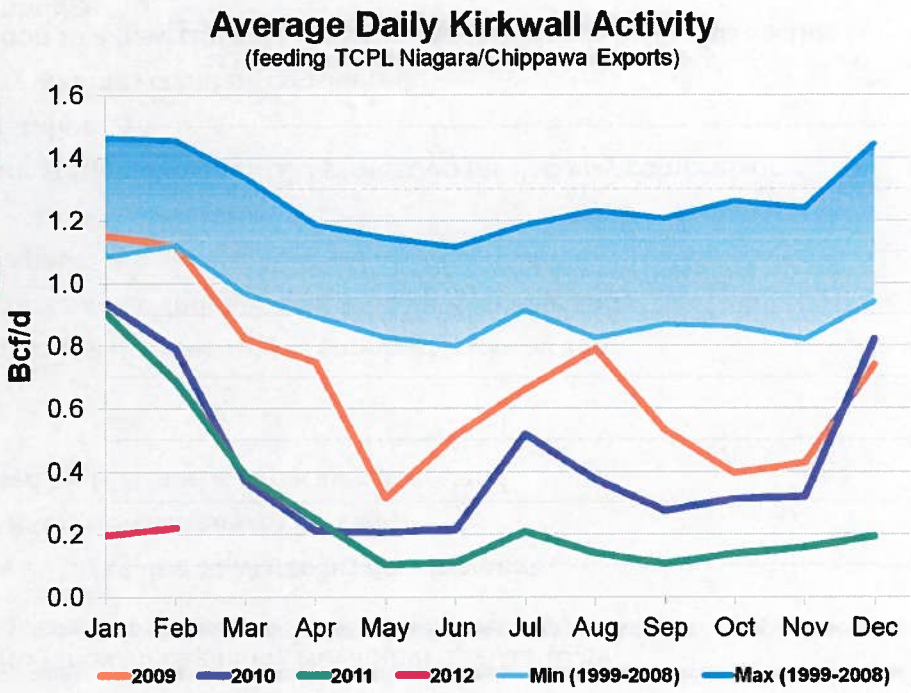
FRC or TRC Meeting | April, 2012

# Agenda

- Background - Changing Supply Dynamics
- Union Gas Strategic Response
- Actions to Date
- Parkway West Project
- Appendix

# Background – Changing Supply Dynamics




**Decreased natural gas flows out of Western Canada into Ontario, coupled with production growth in the Marcellus Shale, are driving exports at Kirkwall to all-time lows**

# Union Gas Strategic Response

Spectra Energy

Background

- Union held discussions in late 2010 and early 2011 with Enbridge to understand their concerns regarding security of supply at Parkway
  - [redacted]
  - [redacted]
  - [redacted]
- Union began receiving significant turn back from TCPL (to Kirkwall) beginning November 1, 2011 (0.89 bcf/d by November 1, 2013)
- Union is now forecasting near zero exports at Kirkwall by 2013/14 due to Marcellus development
- Union's best opportunity to remarket capacity is to customers downstream of Parkway
- Pipe downstream of Parkway (Parkway to Maple) is owned by TCPL and is capacity constrained

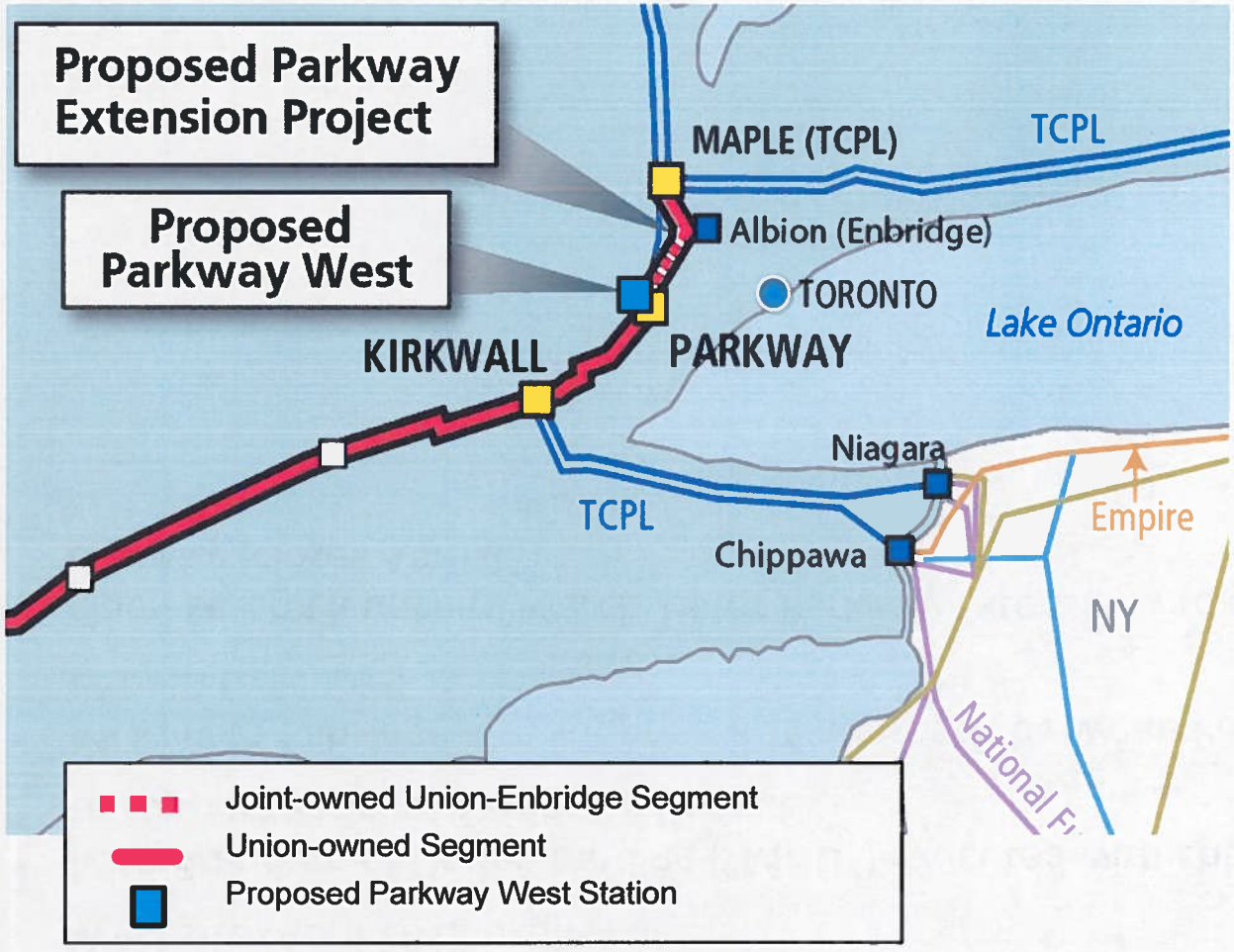
Union Response

- In July of 2011, Union and Enbridge formed a study team to evaluate security of supply at Parkway and to look for synergistic solutions to re-enforce Parkway, create a new independent feed for Enbridge and to expand capacity on the constrained Parkway to Maple path
- Solution:
  - Union to build and own the Parkway West compressor station. Provides LCU protection for Parkway compressor volumes and provides bypass piping around existing station
  - With security of supply addresses, additional Parkway volumes could be considered
  - A new feed into the GTA from the Parkway West station to a new city gate for Enbridge at Albion is built. This section of pipe will be a Joint Venture between Union and Enbridge
  - Union builds and owns the remaining pipe from Albion to Maple. Union would then be able to provide service between Dawn and Maple
  - Sum of all projects defined as "Parkway Projects"

# Actions to Date

- Option to purchase compressor station land secured in 2011 for new Parkway West site (April 2012 expiry)
- Memorandum of Understanding ("MOU") executed with Enbridge and Gaz Métro to support Parkway Extension Project
- MOU with Enbridge also supports a JV approach between Parkway and Albion (part of path to Maple)
- Open season launched March 13 for Parkway Extension Project and Dawn-Parkway capacity (closes April 25)

# Parkway Projects




**Parkway West**

- Loss of Critical Unit Compression
- Second, secure Enbridge feed

**Parkway Extension Project**

- Parkway to Maple Pipeline and Compression

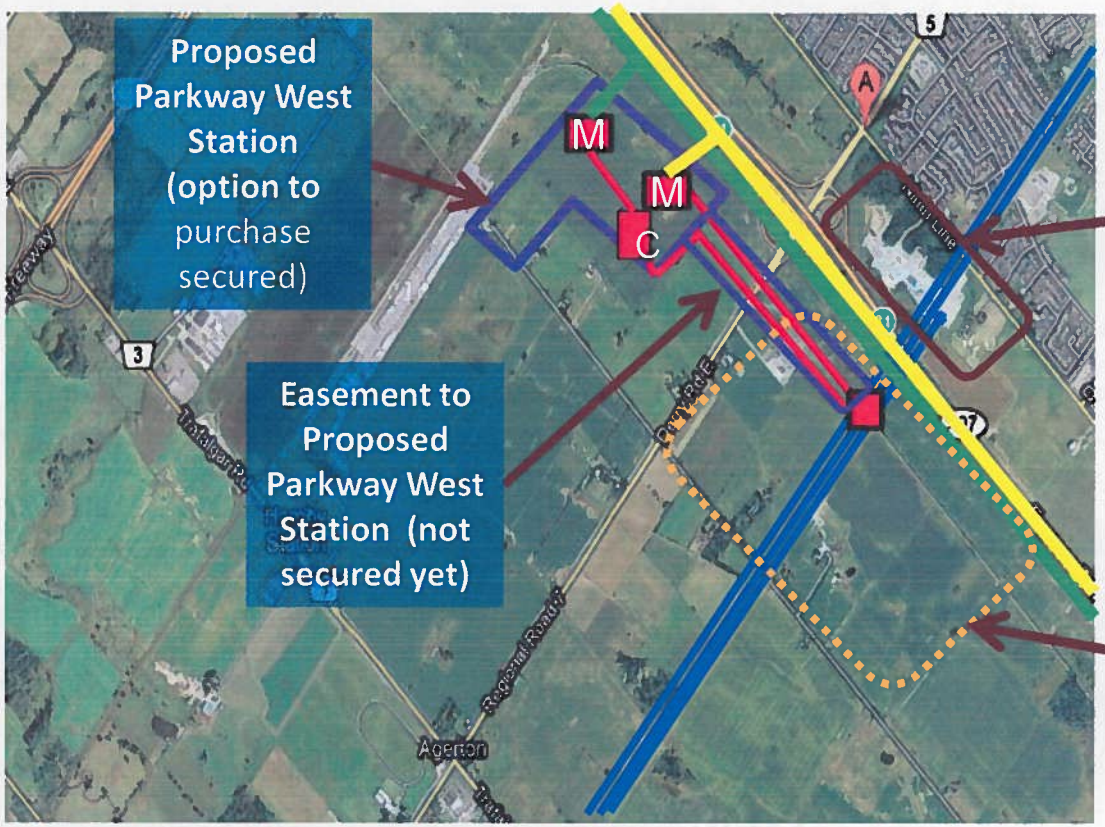
**Suite of projects that will eliminate the bottleneck east of Parkway and provide Enbridge the third feed to the GTA**

# Parkway West

# Transaction Overview

- Gas supply flow dynamics have changed significantly
- As a result, Parkway Compression utilization has increased significantly since 2009 and has also shifted to year-round exports;
  - Peak day flow increased from <0.5 Bcf/d in 2005 to 1.9 Bcf/d in 2011
  - With growth, Parkway flow is expected to exceed 3.0 Bcf/d by 2016
  - Parkway is the only location on Dawn-Parkway system without full Loss of Critical Unit (LCU) protection.
- Parkway West Facilities;
  - LCU Compressor (~47,000 HP)
  - New TCPL metering and interconnect with existing TCPL infrastructure
  - New Enbridge metering and interconnect with existing Enbridge infrastructure
  - Parkway Discharge Metering Upgrade to provide custody transfer measurement for TCPL discharge
  - Future metering and interconnect with new pipeline to Albion/Maple
- Estimated Capital Expenditure: CDN$224 million
- Targeted In-Service Date: November 1, 2014
- No new incremental capacity associated with Parkway West
- Parkway West facilities provide reliability and security of supply for customers east of Parkway and provide ability to re-contract existing capacity and pursue expansion capacity

# Project Map


Proposed Parkway West Station (option to purchase secured)
Easement to Proposed Parkway West Station (not secured yet)
Existing Parkway Station
Target Location for potential Land Swap
M
M
C
A
5
3
Agerton
Union (Existing)
Union (New)
Enbridge
TCPL

# Strategic Rationale

- [redacted]
- [redacted]
- Parkway West provides supply reliability and eliminates this risk
- An outage at Parkway on a peak day would have significant consequences for the GTA
- Parkway West would mitigate the impact of a Parkway compression outage
- Union has and continues to experience decontracting by TCPL on the Dawn to Kirkwall path
- The additional security of supply created by Parkway West will possibly allow Union the ability to resell the turn back capacity
- Parkway West complements future growth projects east of Parkway, including the proposed Parkway Extension Project and Enbridge System Upgrade
- Parkway West complements Ontario and Quebec consumers increasing supply diversity back to Dawn
- Provides operational and maintenance flexibility for Parkway compressor units

# Base Case Assumptions

- In-service Date – November 1, 2014
- Capital - $224 M
- All analysis done in Canadian dollars
- The Union Gas estimate of $224 M was used in analysis, not the Monte Carlo CapEx Mean ($200 M)
- Project economics assume full cost of service recovery in rates at regulated return levels
- Reflects 2013 Rate Case application to increase equity ratio from 36% to 40% and ROE of 9.58%
- Includes 200 basis point increase in ROE above regulated return to recognize revenue synergies realizable from additional transactional services available at Dawn Hub

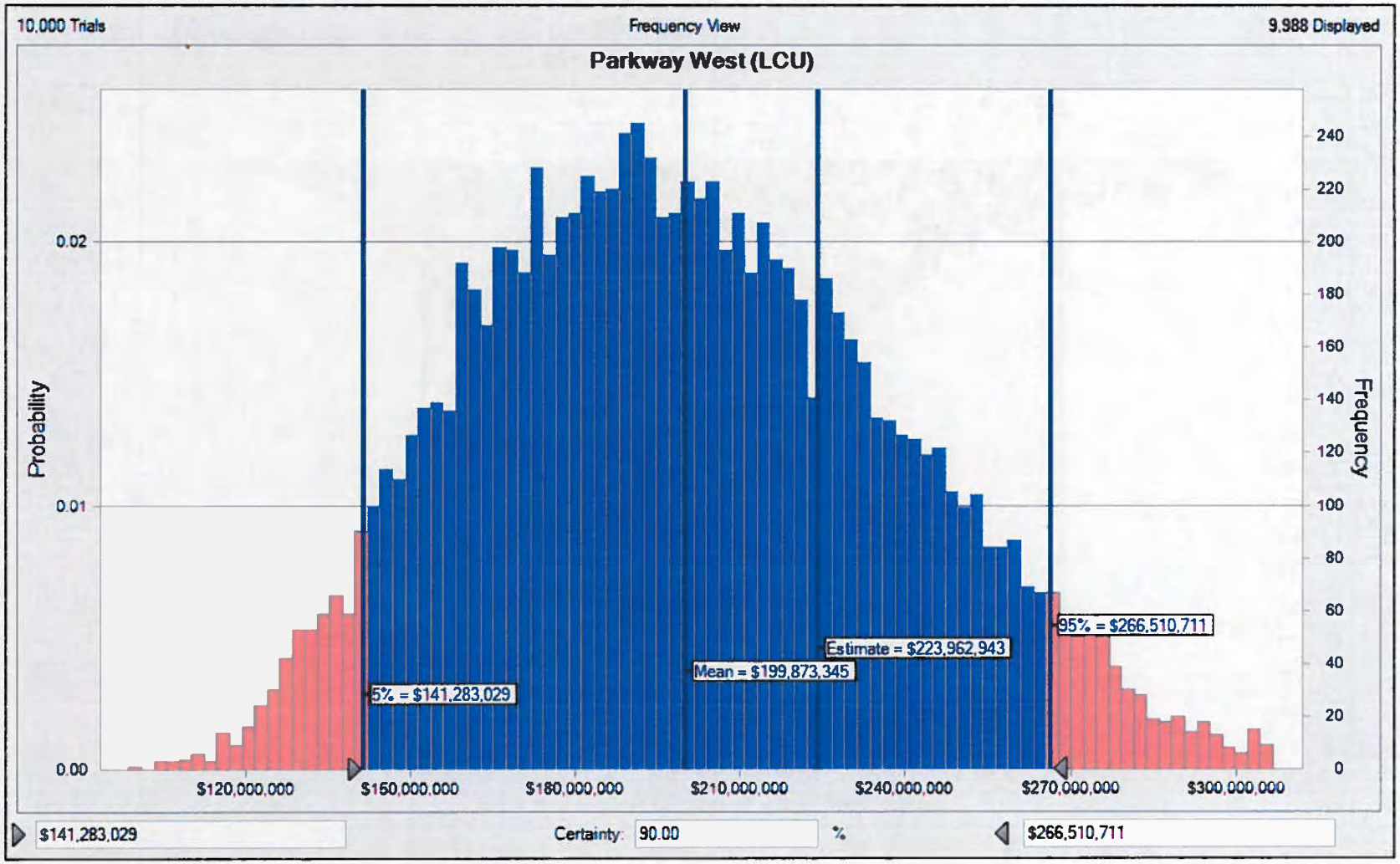
# SE Financial Implication

| | |
|---|---|
| CapEx | $224.0 MM |
| IRR | 6.6% |
| NPV@ 8.5% | ($ 33.9) MM |
| NPV@ 5.8% | $17.9 MM |
| Payback (years) | 17.0 |

| | |
|---|---|
| IRR Based on Regulated Utility Return | 5.5% |
| Increase in Equity ratio to 40% | 0.3% |
| Dawn S&T Transactional Synergies | 0.8% |
| Base Case IRR | 6.6% |

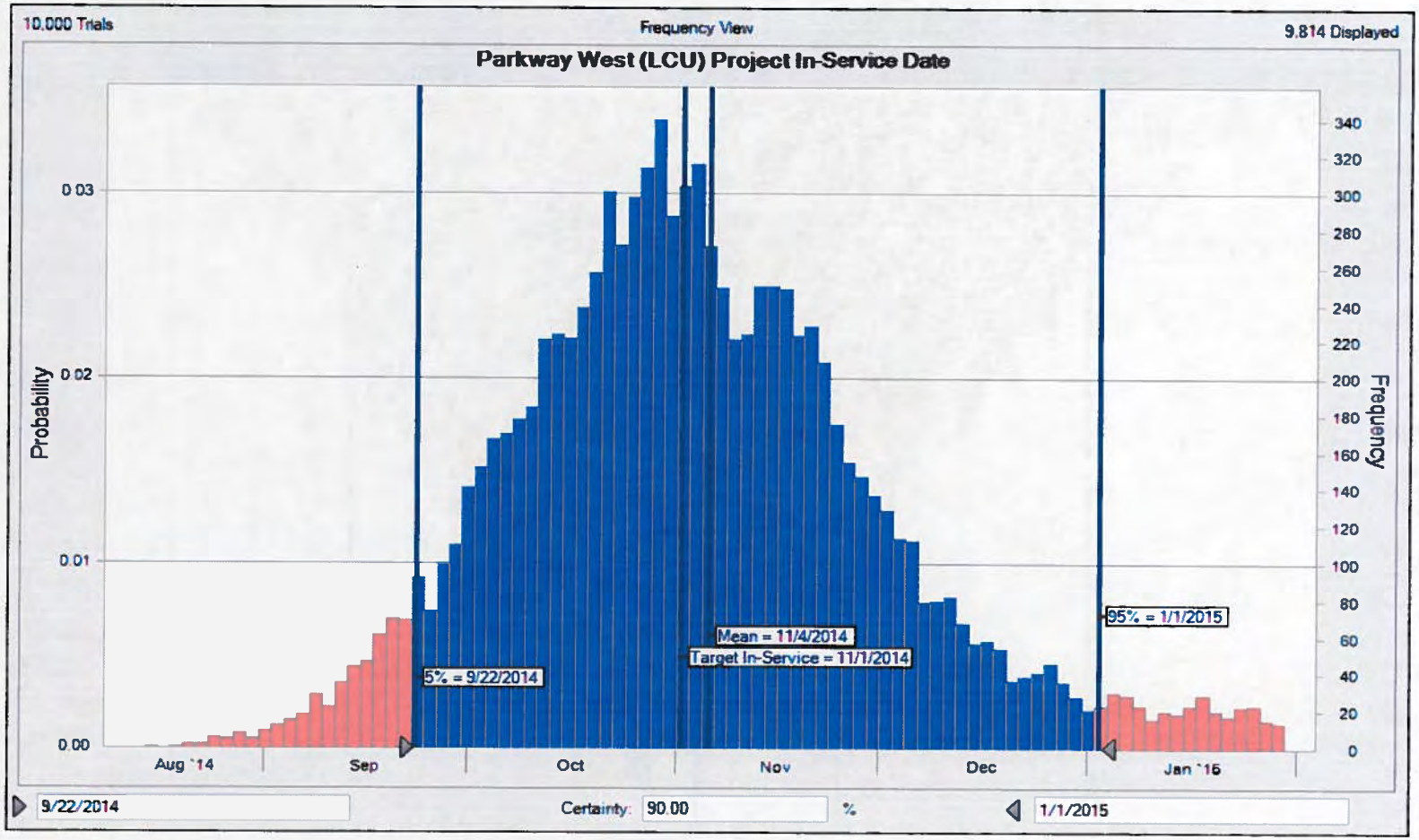
| $ MM CDN | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| CapEx | $0.2 | $36.8 | $40.8 | $144.4 | $1.7 | - | - |
| AT Cash Flow | ($0.2) | ($36.8) | ($40.8) | ($139.8) | $14.4 | $15.9 | $15.7 |
| Revenue | | | | 2.0 | $21.5 | $22.3 | $23.0 |
| EBIT | | | | ($1.4) | $12.8 | $13.5 | $14.1 |
| EBITDA | | | | $1.6 | $18.8 | $19.6 | $20.1 |
| ROCE (%) | | | | (1.0)% | 5.9% | 6.4% | 6.9% |
| ROE (%) | | | | 11.6% | 11.6% | 11.6% | 11.6% |

# CapEx Monte Carlo Results




Estimate is at the 73rd percentile

# Schedule Monte Carlo Results




Target In-Service date is at the 50th percentile

# Risks and Mitigation

| Risk | Mitigation |
|---|---|
| <u>Regulatory Risk</u><br>• OEB Approval of rate increase to cover Parkway West Capital | • Meet with the OEB to describe the linkage to Enbridge GTA upgrade project and the Parkway to Maple extension project.<br>• Consider early filing for OEB approval<br>• Seek specific cost recovery through new IR framework<br>• Demonstrate market support for Parkway to Maple and customer decision for greater supply diversity |
| • Ability to acquire easements for headers from Trafalgar Lines | • Apply early for project approval and expropriation rights, if necessary<br>• Potential for Parkway West land swap that would eliminate need for headers on easement |
| <u>Competitive Risk</u><br>• TCPL's competitive response | • Detailed regulatory and advocacy strategy |

# Risks and Mitigation

| Risk | Mitigation |
|---|---|
| <u>Cost Overrun Risk</u><br>• Material and construction cost overruns for major components (i.e. compressor package, meters and pipe) | • Early order of major equipment (Compressor – August 2012)<br>• Potential for land swap – would reduce capital cost<br>• Feasibility level cost estimate includes 20% contingency (excludes land purchase)<br>• Pre-spend allows for preliminary engineering to be completed to develop pre-budget quality estimate for planning |
| • Land cost increasing (Station property) | • Exercise land option and secure station property |
| • Cost of easements for headers from Trafalgar Lines | • Purchase or option easements as soon as possible to lock in cost for Union Gas headers from Trafalgar lines<br>• Land swap would eliminate need for easement for headers |
| <u>Timing</u><br>• Delay in overall Project timing | • Managed through project management process and focus |
| • Delay in securing permits | • Apply for as early as possible |

# Summary

- Parkway West is critical infrastructure
- Parkway West addresses supply reliability related to the significant changes in gas flows in Ontario
- Provides reliability for existing and new export volumes for customers downstream of Parkway (Enbridge, Gaz Métro and ANE)
- Provides opportunity to re-contract Dawn-Kirkwall capacity turned back by TCPL
- Complements Parkway Extension Project (Parkway-Maple) which facilitates Ontario consumers supply diversity back to Dawn

# Next Steps

- Union requests FRC endorsement to seek approval from the TRC for pre-spend capital of $37.3 million in 2012
- Prior to seeking FRC endorsement of full project, advance Parkway West by securing lands, completing detailed engineering and committing to vendor engineering for the compressor unit
- Seek FRC, TRC and SE Board of Directors final approval of full project in 2H2012 once detailed engineering and costing is completed

# Appendices

- Capital Costs
- SE Financial Implication – Based on Deferred Tax
- Union Gas System Map
- Parkway Extension Project Background

# Preliminary Parkway West Capital Costs

| Year | Project Component | Cost (as spent millions CDN) |
|---|---|---|
| 2012 | Purchase Parkway West Land and Easements | $26 |
| 2013 | Upgrade Existing Parkway Discharge Metering | $8 |
| 2014 | Parkway West – Trafalgar Connection and Header | $29 |
| 2014 | Enbridge Measurement and Parkway Header | $35 |
| 2014 | TCPL Measurement | $19 |
| 2014 | LCU Compression | $107 |
| | TOTAL | $224 |

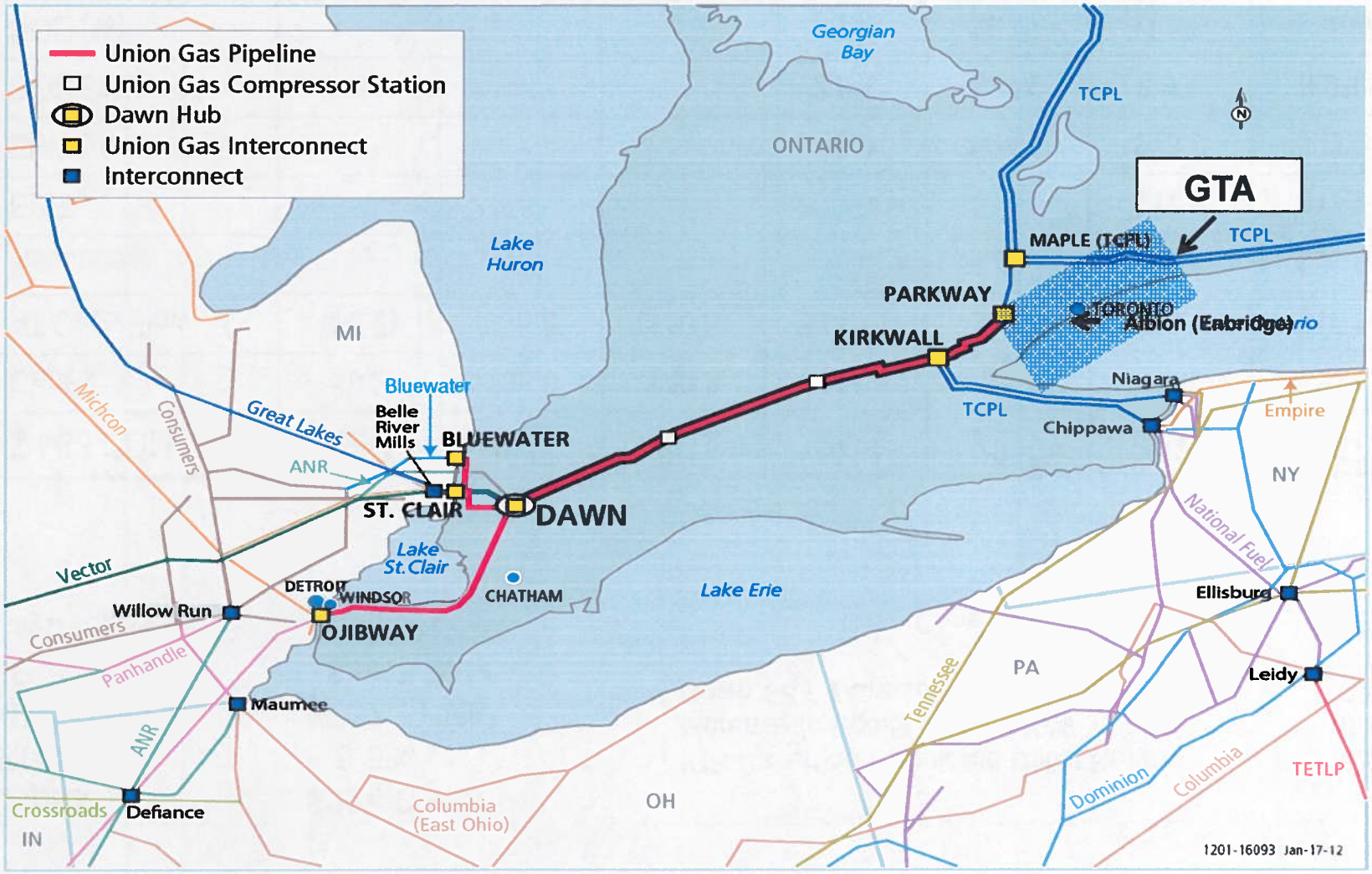
# SE Financial Implication - Based on Deferred Tax

| | |
|---|---|
| CapEx | $224.0 MM |
| IRR | 6.6% |
| NPV@ 8.5% | ($ 32.6) MM |
| NPV@ 5.8% | $14.3 MM |
| Payback (years) | 18.0 |

| | |
|---|---|
| IRR Based on Regulated Utility Return | 5.5% |
| Increase in Equity ratio to 40% | 0.3% |
| Dawn S&T Transactional Synergies | 0.8% |
| Base Case IRR | 6.6% |

| $ MM CDN | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| CapEx | $0.2 | $36.8 | $40.8 | $144.4 | $1.7 | - | - |
| AT Cash Flow | ($0.2) | ($36.8) | ($40.8) | ($140.1) | $14.1 | $15.5 | $15.1 |
| Revenue | | | | 6.4 | $27.3 | $26.7 | $26.0 |
| EBIT | | | | $3.0 | $18.6 | $17.9 | $17.2 |
| EBITDA | | | | $6.0 | $24.6 | $23.9 | $23.2 |
| ROCE (%) | | | | 2.0% | 8.8% | 8.9% | 8.9% |
| ROE (%) | | | | 9.7% | 11.7% | 11.8% | 11.8% |

# Union Gas System Map



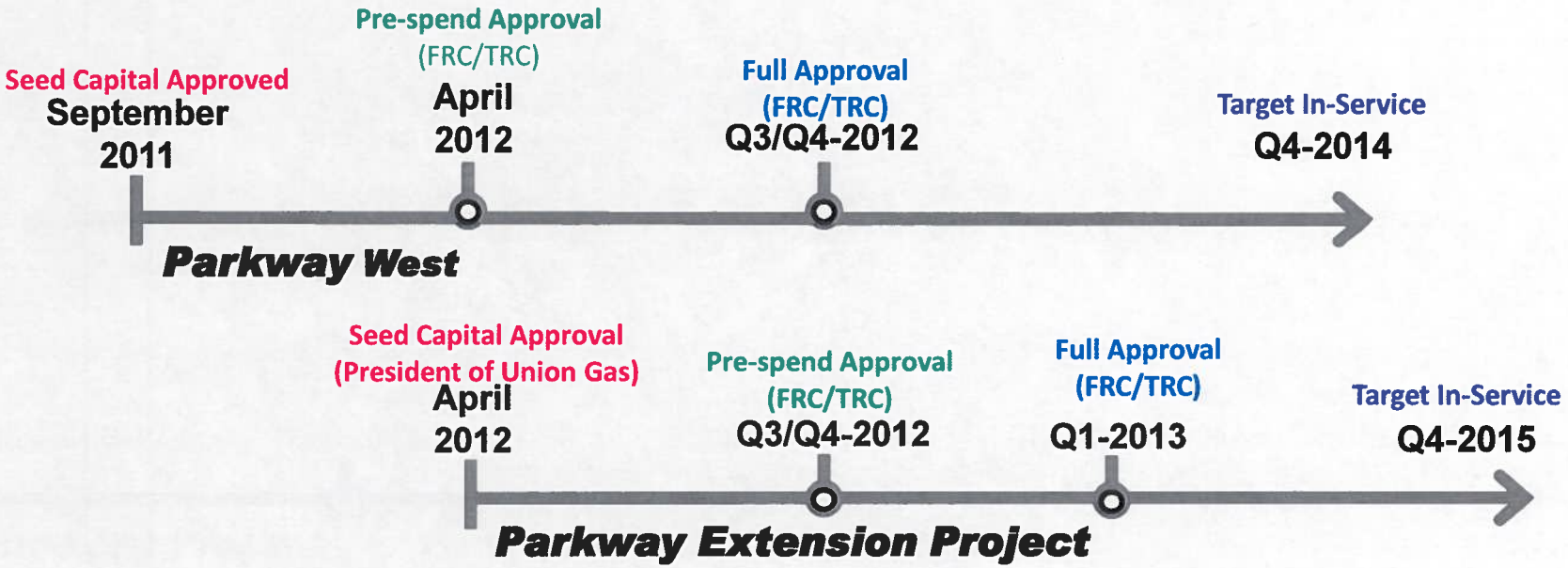
# Parkway Extension Project

- Growth project that extends the Union Gas system from Parkway to Maple and eliminates the bottleneck east of Parkway
- Parkway to Albion (or Maple) jointly owned with Enbridge in undivided interest. [redacted]
- Binding open season launched in March for ~ 1 PJ/d of capacity to Parkway plus 500-700 mmcfd of capacity to Maple (in addition to Enbridge Albion requirement)
  - Non-binding MOU's executed with Enbridge and Gaz Metro
- Facilities include:
  - 29 mile Parkway to Maple Pipeline (36 or 42 inch)
  - Maple and Parkway ('D' Plant) Compression
- November 1, 2015 in-service target
- $400-600 M estimated capital cost added to Union Gas rate base

# Parkway Extension Project Strategic Rationale

- Serves growing demand for natural gas in Ontario, Quebec and the US Northeast
- Provides consumers with choice: a new transportation option to link supply with demand, supporting the development of new natural gas infrastructure
- Provides secure access to diverse supply basins for residential, commercial, industrial, and Direct Purchase customers within the Union Gas, Enbridge and Gaz Métro franchise areas
- Provides access to affordable energy options
- Supports economic development powered by cleaner energy – (Ontario's off-coal initiative)
- Enhances reliability and security of supply by providing a second pipeline option to Maple and supports upgrades to the GTA delivery system.
- Links markets and supply basins to the Dawn Hub, Canada's largest underground storage facility, where Shippers can contract for Union's suite of innovative, customizable storage and transmission services
- Joint pipeline development serving Union Gas and Enbridge needs creates synergies for economics as well as environmental and social impacts

# Parkway Projects Estimated Approval Timeline



# Parkway Projects

## *Parkway West Pre-spend Approval*

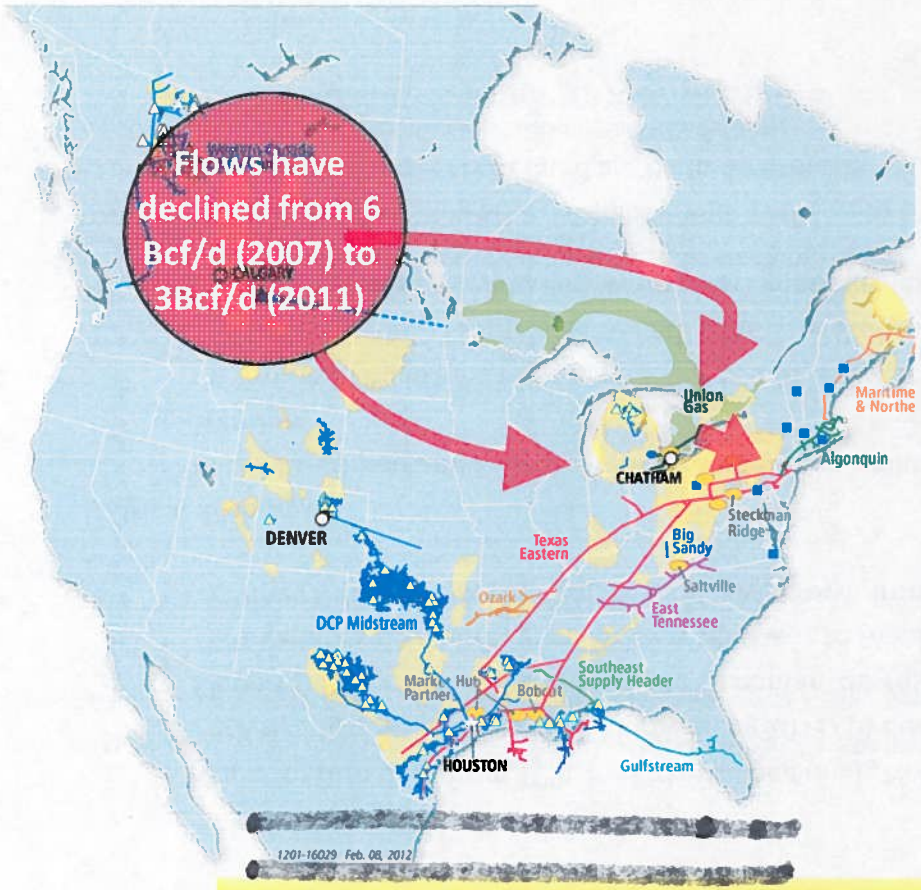
Mark Isherwood – VP Business Development, Storage and Transmission
Jim Redford - Director, Business Development & Strategic Accounts

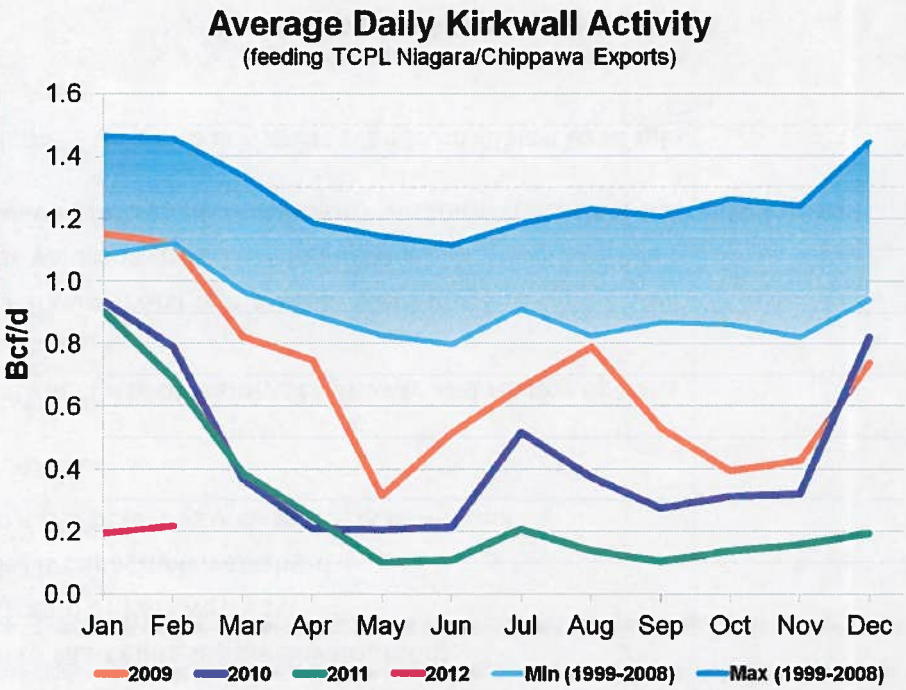
TRC Meeting | April 9, 2012

# Agenda

- Background - Changing Supply Dynamics
- Union Gas Strategic Response / Actions to Date
- Parkway West Project
- Appendix

# Background – Changing Supply Dynamics




**Decreased natural gas flows out of Western Canada into Ontario, coupled with production growth in the Marcellus Shale, are driving exports at Kirkwall to all-time lows**

# Union Gas Strategic Response

Spectra Energy

**Background**

- Discussions in late 2010 and early 2011 with Enbridge re: concerns regarding security of supply at Parkway
  - [redacted]
  - [redacted]
  - [redacted]
- Capacity turn back from TCPL (to Kirkwall) beginning November 1, 2011 – expect 0.9 bcfd by November 1, 2013
- Forecasting near zero exports at Kirkwall by 2013/14 due to Marcellus supply development
- Opportunity to remarket capacity is to customers downstream of Parkway
- TCPL capacity downstream of Parkway (Parkway to Maple) is capacity constrained
- Volumes through Parkway compression have grown from < 0.5 bcfd in 2005 to 1.9 bcfd in 2012

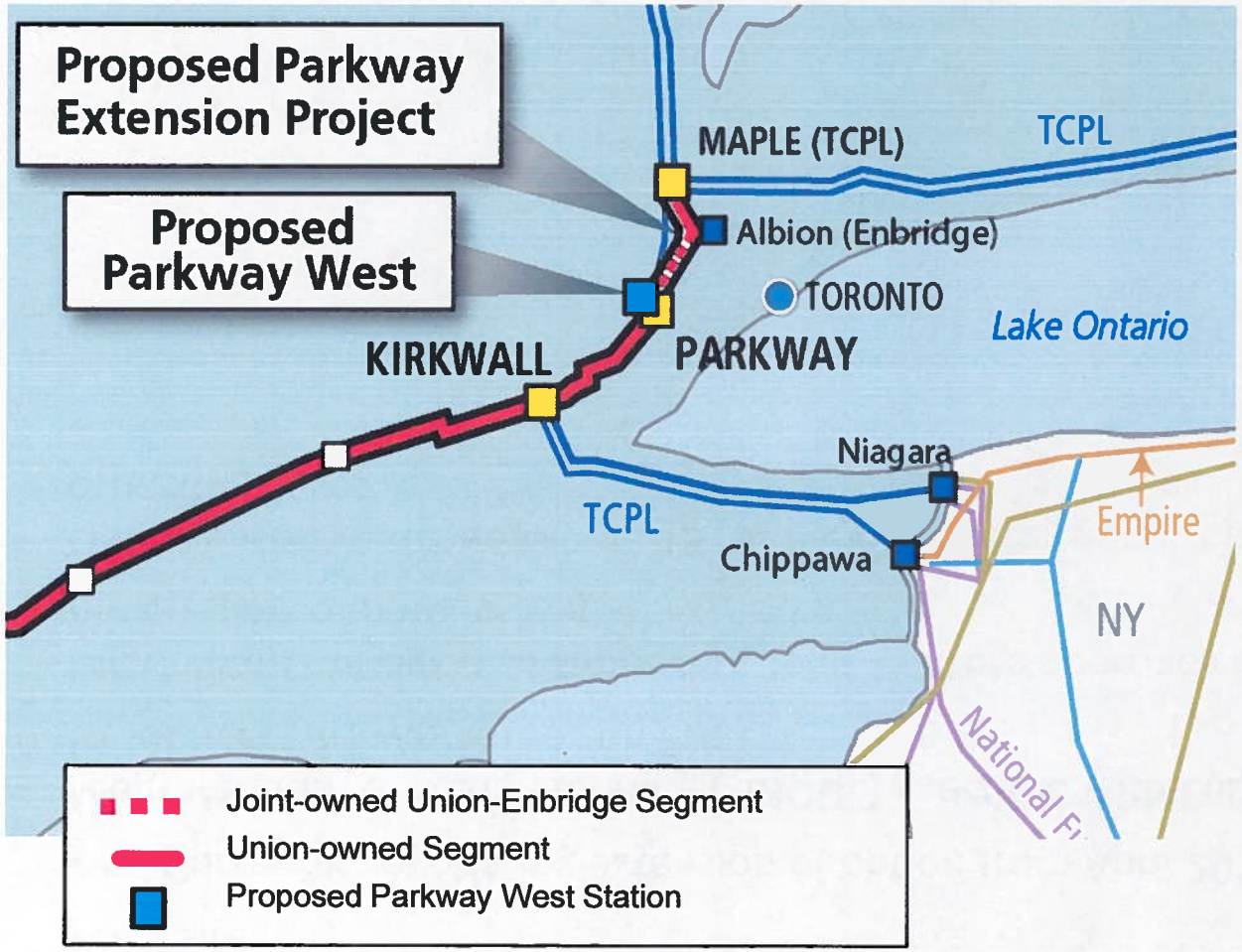
**Union Response**

- In 1H/11 - Union and Enbridge team assembled to evaluate security of supply at Parkway and review options
- Solution:
  - Union to build new redundant (LCU) compression at Parkway West compressor station.
  - With security of supply addressed, additional Parkway volumes could be considered
  - New Parkway compression will support Enbridge new feed into the GTA (Albion) via Joint Venture between Union and Enbridge and new demands from eastern markets
  - Seek market support for capacity from Parkway to Maple – Union to construct pipe from Albion to Maple
  - Sum of all projects defined as "Parkway Projects"

# Actions to Date

- Option to purchase compressor station land secured in 2011 for new Parkway West site
  - Currently negotiating extension of option from April 2012 expiry to April 2013
- Memorandum of Understanding ("MOU") executed with Enbridge and Gaz Métro to support Parkway Extension Project
- MOU with Enbridge also supports a Joint Venture approach between Parkway and Albion (part of path to Maple)
- Open season launched March 13 for Parkway Extension Project and Dawn-Parkway capacity (closes April 25)

# Parkway Projects




**Parkway West**

- Loss of Critical Unit Compression
- Second, secure Enbridge feed

**Parkway Extension Project**

- Parkway to Maple Pipeline and Compression

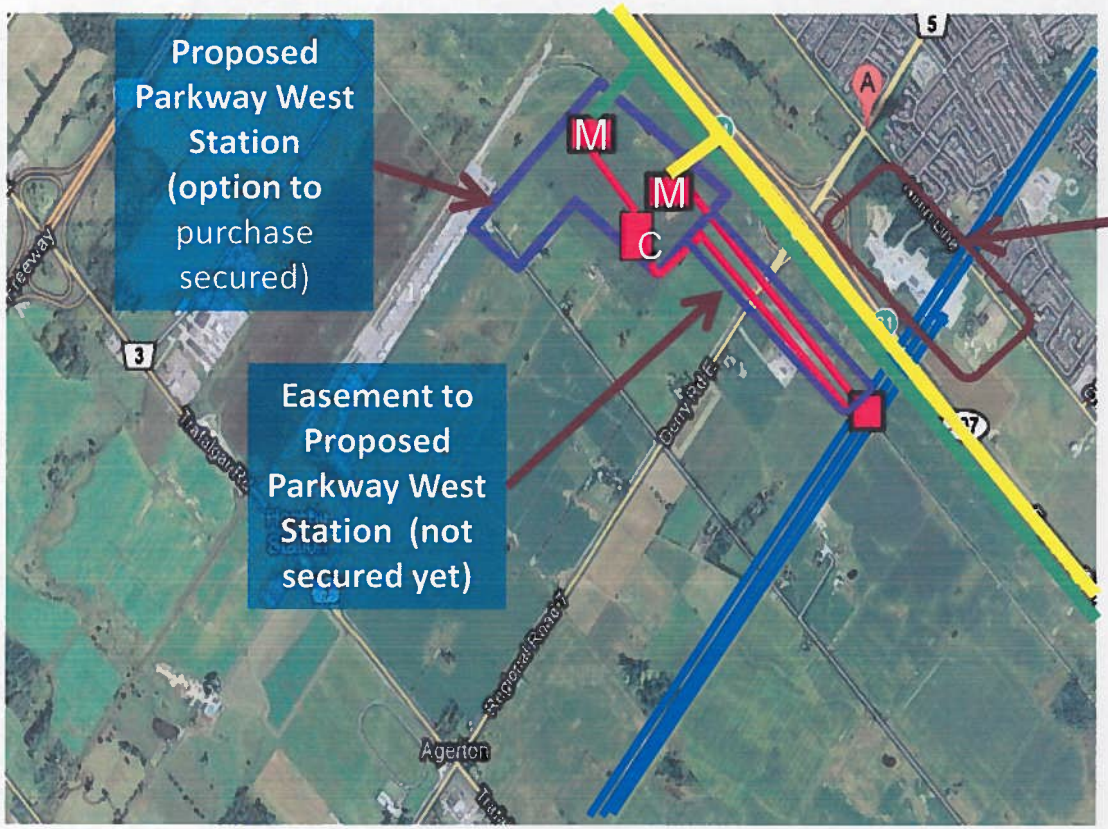
**Suite of projects that will eliminate the bottleneck east of Parkway and provide Enbridge the third feed to the GTA**

# Parkway West

# Transaction Overview

- Parkway West Facilities;
  - LCU Compressor (~47,000 HP)
  - New TCPL metering and interconnect with existing TCPL infrastructure
  - New Enbridge metering and interconnect with existing Enbridge infrastructure
  - Parkway Discharge Metering Upgrade to provide custody transfer measurement for TCPL discharge
  - Future metering and interconnect with new pipeline to Albion/Maple
- Estimated Capital Expenditure: CDN$224 million
- Project currently considered Maintenance Capital
- Targeted In-Service Date: November 1, 2014
- No new incremental capacity associated with Parkway West
- Parkway West facilities required to support reliability and security of supply for existing customer volumes and markets east of Parkway
- New Parkway West station would provide ability to expand system and volumes going forward

# Project Map


Proposed Parkway West Station (option to purchase secured)
Easement to Proposed Parkway West Station (not secured yet)
Existing Parkway Station
M
M
C
A
5
3
Agerton
Union (Existing)
Union (New)
Enbridge
TCPL

# Strategic Rationale

- An outage at Parkway on a peak day would have significant consequences for the GTA and Ontario
- Parkway West required to provide security of supply reliability for existing Parkway demands
- Parkway West would mitigate the impact of a Parkway compression outage
- Parkway West complements future growth projects east of Parkway, including the proposed Parkway
- Extension Project and Enbridge System Upgrade
- Provides operational and maintenance flexibility for Parkway compressor units

# Base Case Assumptions

- In-service Date – November 1, 2014
- Capital - $224 M
- All analysis done in Canadian dollars
- Project economics assume full cost of service recovery in rates at regulated return levels
- Reflects 2013 Rate Case application to increase equity ratio from 36% to 40% and ROE of 9.58%

# SE Financial Implication

| | |
|---|---|
| CapEx | $224.0 MM |
| IRR | 6.6% |
| NPV@ 8.5% | ($ 33.9) MM |
| NPV@ 5.8% | $17.9 MM |
| Payback (years) | 17.0 |

| | |
|---|---|
| IRR Based on Regulated Utility Return | 5.5% |
| Increase in Equity ratio to 40% | 0.3% |
| ROE Upside | 0.8% |
| Base Case IRR | 6.6% |

| $ MM CDN | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| CapEx | $0.2 | $36.8 | $40.8 | $144.4 | $1.7 | - | - |
| AT Cash Flow | ($0.2) | ($36.8) | ($40.8) | ($139.8) | $14.4 | $15.9 | $15.7 |
| Revenue | | | | 2.0 | $21.5 | $22.3 | $23.0 |
| EBIT | | | | ($1.4) | $12.8 | $13.5 | $14.1 |
| EBITDA | | | | $1.6 | $18.8 | $19.6 | $20.1 |
| ROCE (%) | | | | (1.0)% | 5.9% | 6.4% | 6.9% |
| ROE (%) | | | | 11.6% | 11.6% | 11.6% | 11.6% |

# Risks and Mitigation

| Risk | Mitigation |
|---|---|
| <u>Regulatory Risk</u><br>• OEB Approval of rate increase to cover Parkway West Cost of service | • proactive outreach with OEB<br>• Pursue early filing for OEB facilities approval<br>• Coordinate regulatory application for Parkway West with Enbridge GTA upgrade project<br>•Seek specific cost recovery mechanism through new IR framework<br>• Demonstrate market support for Parkway to Maple and customer desire for greater supply diversity |
| • Ability to acquire easements for headers from Trafalgar Lines | • Apply early for project approval and expropriation rights, if necessary |
| <u>Competitive Risk</u><br>• TCPL's competitive response | • demonstrate market and system need for LCU capacity at Parkway |

# Risks and Mitigation

| Risk | Mitigation |
|---|---|
| <u>Cost Overrun</u><br>• Material and construction cost overruns for major components (i.e. compressor package, meters and pipe) | • Early order of major equipment (Compressor engineering – July 2012)<br>• Feasibility level cost estimate includes 20% contingency (excludes land purchase)<br>• Pre-spend allows for preliminary engineering to be completed to develop pre-budget quality estimate for planning |
| • Land cost (Station property) | • Exercise land option and secure station property |
| • Cost of easements for headers from Trafalgar Lines | • Purchase or option easements as soon as possible to lock in cost for Union Gas headers from Trafalgar lines |
| <u>Timing</u><br>• Delay in overall Project timing | • Managed through project management process and focus |
| • Delay in securing permits | • Apply for as early as possible |

# Parkway West Timelines

- Negotiate Land Option Extension – April 2012
  - Exercise Land Option – April 30, 2012 if option extension cannot be negotiated
- Complete detailed Station and pipeline engineering design - Start May 2012
  - Supports compressor package design, permitting and OEB filing
- Complete compressor package engineering (Vendor) – Start July 2012
  - Commit to compressor order in Q4 2012 or Q1 2013
- OEB Filing – Q3 2012 (aligned with Enbridge Reinforcement filing)
  - Leave to Construct for compression and header pipelines
- Seek rate recovery through new incentive rate framework
- Order material for Parkway metering upgrade – Q4 2012
- Commit to Parkway West long lead items - Q2 2013
  - 54" pipe, valves, buildings, major equipment

# Parkway West
# 2012 Cash Flow

| Project Component | To Date | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Land and Easements | | | | $20.0 | | | | $6.0 | | | $26.0 |
| Compressor Engineering & Early Order | | | | | | $2.5 | | | $3.6 | | $6.1 |
| Detailed Station and Pipeline Design | $0.4 | $0.1 | $0.6 | $0.2 | $0.3 | $0.3 | $0.3 | $0.4 | $0.3 | $0.4 | $3.3 |
| Contingency | | | | | | | | | | | $1.8 |
| IDC | | | | | | | | | | | $0.1 |
| **TOTAL** | | | | | | | | | | | $37.3M |

Note:
- All costs in $CDN
- Land and Easement costs assume land option (easement) and option extension (station property) were not available and full payment required.

# Summary

- Parkway West is critical to support reliability of existing customer demands
- Parkway West driven by significant changes in gas flows in Ontario
- Provides reliability for existing and new export volumes for customers downstream of Parkway (Enbridge, Gaz Métro and ANE)
- Provides compressor station footprint to support future demands from eastern Canadian and US shippers at Parkway

# Next Steps

- Union request TRC approval of pre-spend capital of $37.3 million in 2012 (assumes no land option extension)
- Seek FRC, TRC and Board approvals as necessary in 2H2012 upon completion of detailed engineering cost estimates

# Appendices

- SE Financial Implication – Based on Deferred Tax (Parkway West)

# SE Financial Implication - Based on Deferred Tax

| | |
|---|---|
| CapEx | $224.0 MM |
| IRR | 6.6% |
| NPV@ 8.5% | ($ 32.6) MM |
| NPV@ 5.8% | $14.3 MM |
| Payback (years) | 18.0 |

| | |
|---|---|
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| Increase in Equity ratio to 40% | 0.3% |
| ROE Upside | 0.8% |
| Base Case IRR | 6.6% |

| $ MM CDN | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| CapEx | $0.2 | $36.8 | $40.8 | $144.4 | $1.7 | - | - |
| AT Cash Flow | ($0.2) | ($36.8) | ($40.8) | ($140.1) | $14.1 | $15.5 | $15.1 |
| Revenue | | | | 6.4 | $27.3 | $26.7 | $26.0 |
| EBIT | | | | $3.0 | $18.6 | $17.9 | $17.2 |
| EBITDA | | | | $6.0 | $24.6 | $23.9 | $23.2 |
| ROCE (%) | | | | 2.0% | 8.8% | 8.9% | 8.9% |
| ROE (%) | | | | 9.7% | 11.7% | 11.8% | 11.8% |

uniongas

A Spectra Energy Company

CELEBRATING
100 YEARS
Est. 1911

# New Projects for the Canadian Marketplace


Allen Capps,
V.P. Business Development Storage & Transportation



Filed: 2012-05-04
EB-2011-0210
J.B-1-7-8
Attachment 3

# Safe Harbor Statement

Some of the statements in this document concerning future company performance will be forward-looking within the meanings of the securities laws. Actual results may materially differ from those discussed in these forward-looking statements, and you should refer to the additional information contained in Spectra Energy's Form 10-K and other filings made with the SEC concerning factors that could cause those results to be different than contemplated in today's discussion.

## Reg G Disclosure

In addition, today's discussion includes certain non-GAAP financial measures as defined under SEC Regulation G. A reconciliation of those measures to the most directly comparable GAAP measures is available on our website.

# Spectra Energy At a Glance

## Canadian Assets

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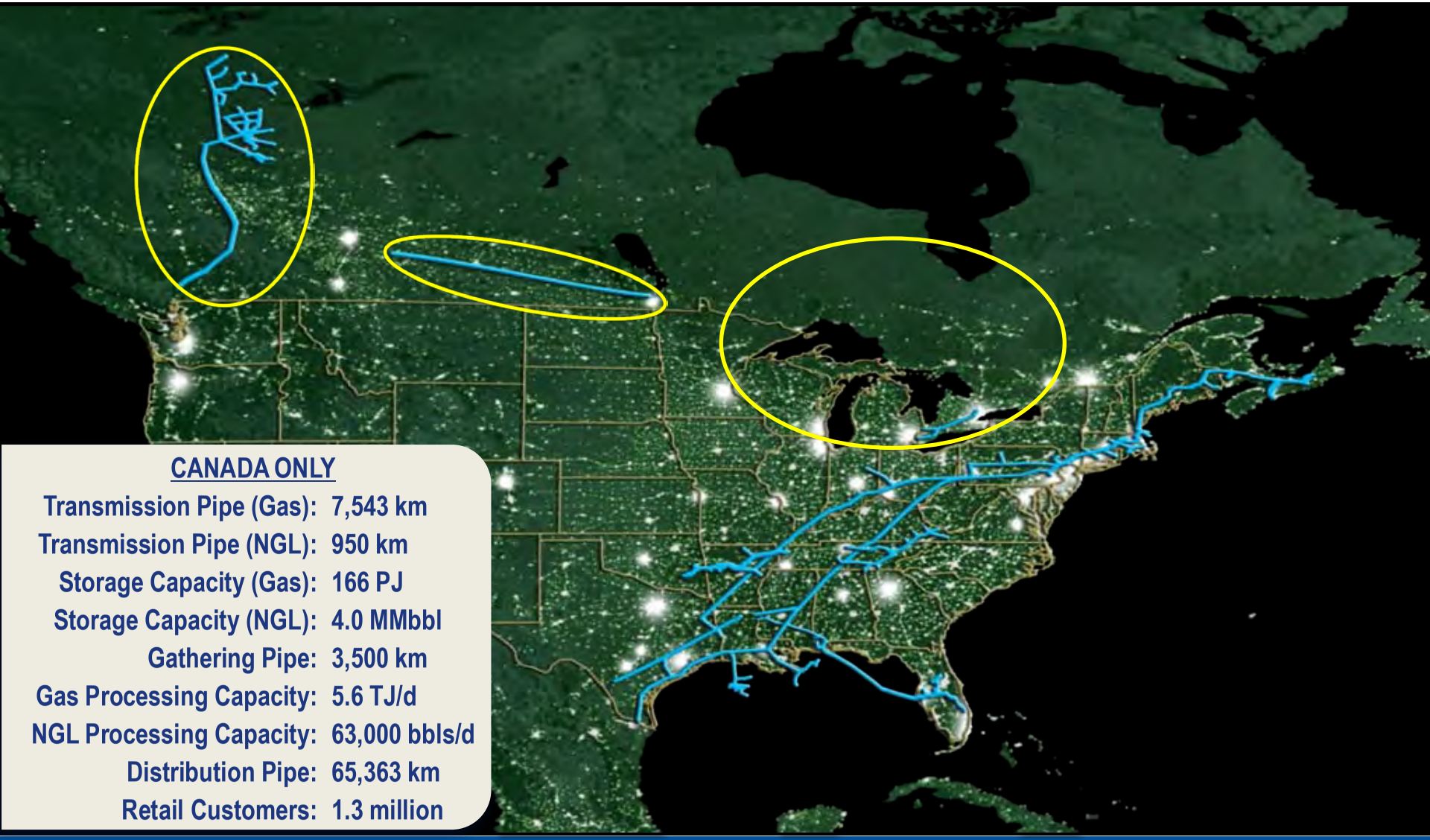

**CANADA ONLY**

| | |
|---|---|
| Transmission Pipe (Gas): | 7,543 km |
| Transmission Pipe (NGL): | 950 km |
| Storage Capacity (Gas): | 166 PJ |
| Storage Capacity (NGL): | 4.0 MMbbl |
| Gathering Pipe: | 3,500 km |
| Gas Processing Capacity: | 5.6 TJ/d |
| NGL Processing Capacity: | 63,000 bbls/d |
| Distribution Pipe: | 65,363 km |
| Retail Customers: | 1.3 million |

# Changing Market Fundamentals

## Major North American Shale Plays

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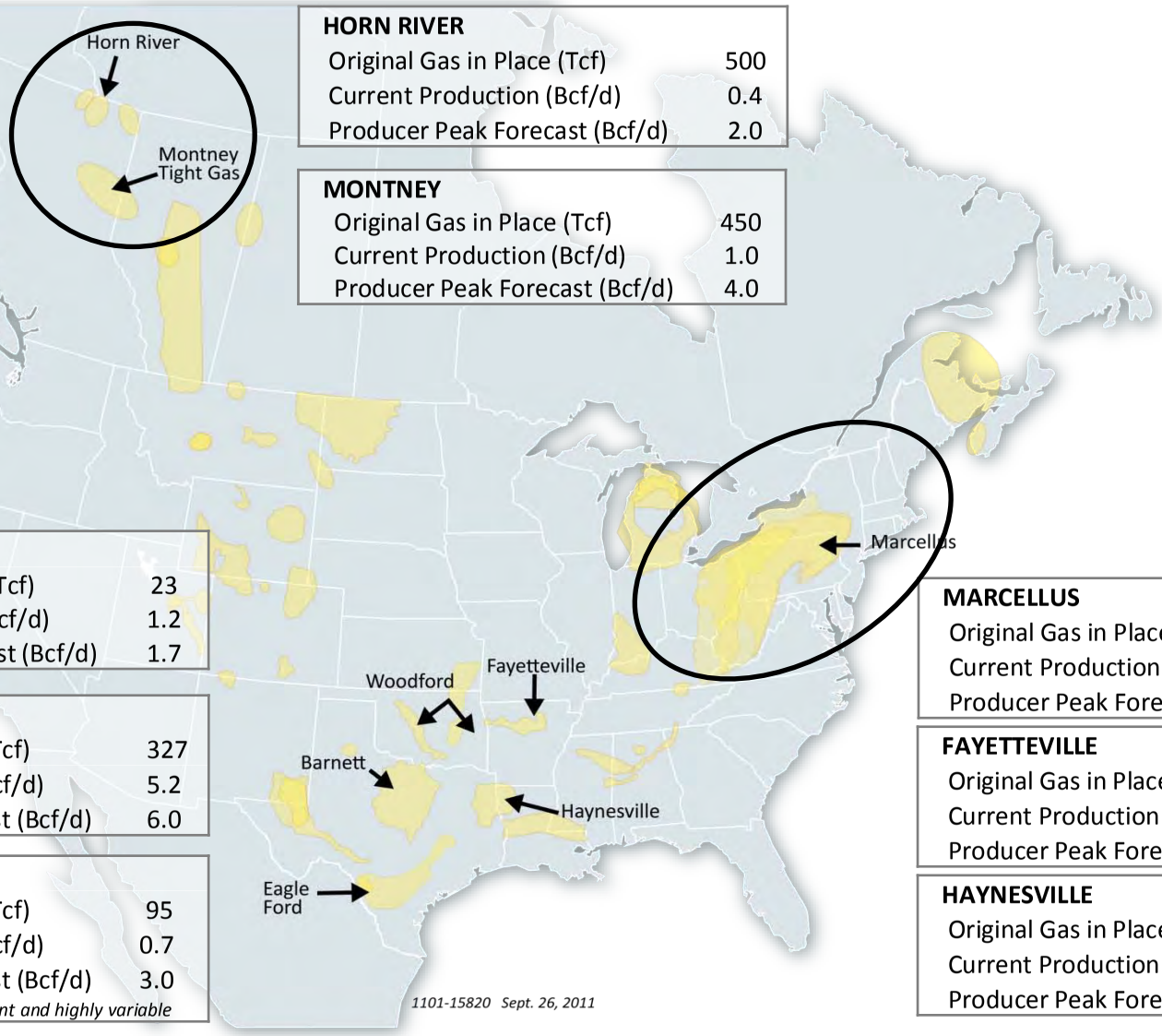
CELEBRATING 100 YEARS Est. 1911




| HORN RIVER | |
|---|---|
| Original Gas in Place (Tcf) | 500 |
| Current Production (Bcf/d) | 0.4 |
| Producer Peak Forecast (Bcf/d) | 2.0 |

| MONTNEY | |
|---|---|
| Original Gas in Place (Tcf) | 450 |
| Current Production (Bcf/d) | 1.0 |
| Producer Peak Forecast (Bcf/d) | 4.0 |

| WOODFORD | |
|---|---|
| Original Gas in Place (Tcf) | 23 |
| Current Production (Bcf/d) | 1.2 |
| Producer Peak Forecast (Bcf/d) | 1.7 |

| BARNETT | |
|---|---|
| Original Gas in Place (Tcf) | 327 |
| Current Production (Bcf/d) | 5.2 |
| Producer Peak Forecast (Bcf/d) | 6.0 |

| EAGLE FORD* | |
|---|---|
| Original Gas in Place (Tcf) | 95 |
| Current Production (Bcf/d) | 0.7 |
| Producer Peak Forecast (Bcf/d) | 3.0 |

*Play in early stages of development and highly variable

| MARCELLUS | |
|---|---|
| Original Gas in Place (Tcf) | 1,500 |
| Current Production (Bcf/d) | 2.0+ |
| Producer Peak Forecast (Bcf/d) | 10.0 |

| FAYETTEVILLE | |
|---|---|
| Original Gas in Place (Tcf) | 52 |
| Current Production (Bcf/d) | 2.5 |
| Producer Peak Forecast (Bcf/d) | 3.0 |

| HAYNESVILLE | |
|---|---|
| Original Gas in Place (Tcf) | 717 |
| Current Production (Bcf/d) | 5.5 |
| Producer Peak Forecast (Bcf/d) | 10.0 |

# SET West At a Glance

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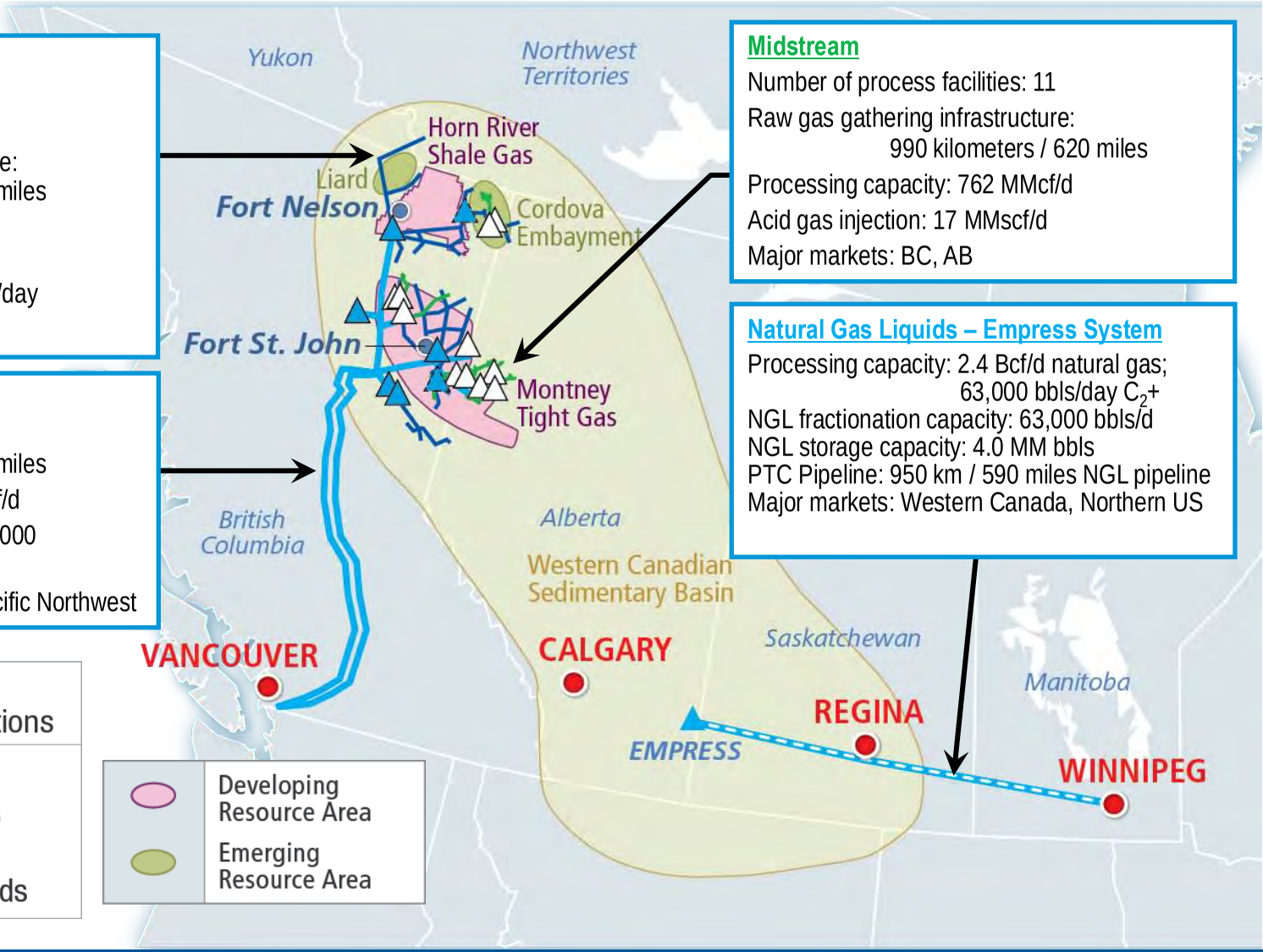
Est. 1911

**BC Field Services**
Number of process plants: 5
Booster stations: 17
Raw gas gathering infrastructure:
2,500 kilometers / 1,550 miles
Processing capacity: 2.1 Bcf/d
Acid gas injection: 42 MMscf/d
Sulphur capacity: 3,000 tonnes/day
Major markets: BC, AB

**BC Pipeline**
Length of pipeline:
2,800 kilometers / 1,700 miles
Transportation capacity: 2.4 Bcf/d
Compression horsepower: 600,000
(18 compressor stations)
Major markets: BC, AB, US Pacific Northwest

**Midstream**
Number of process facilities: 11
Raw gas gathering infrastructure:
990 kilometers / 620 miles
Processing capacity: 762 MMcf/d
Acid gas injection: 17 MMscf/d
Major markets: BC, AB

**Natural Gas Liquids – Empress System**
Processing capacity: 2.4 Bcf/d natural gas;
63,000 bbls/day $C_2$+
NGL fractionation capacity: 63,000 bbls/d
NGL storage capacity: 4.0 MM bbls
PTC Pipeline: 950 km / 590 miles NGL pipeline
Major markets: Western Canada, Northern US




Spectra Energy
Western Canada Operations

- BC Pipeline
- BC Field Services
- Midstream
- Natural Gas Liquids

# Changing Market Fundamentals

## Western Canadian Unconventional Supply Growth

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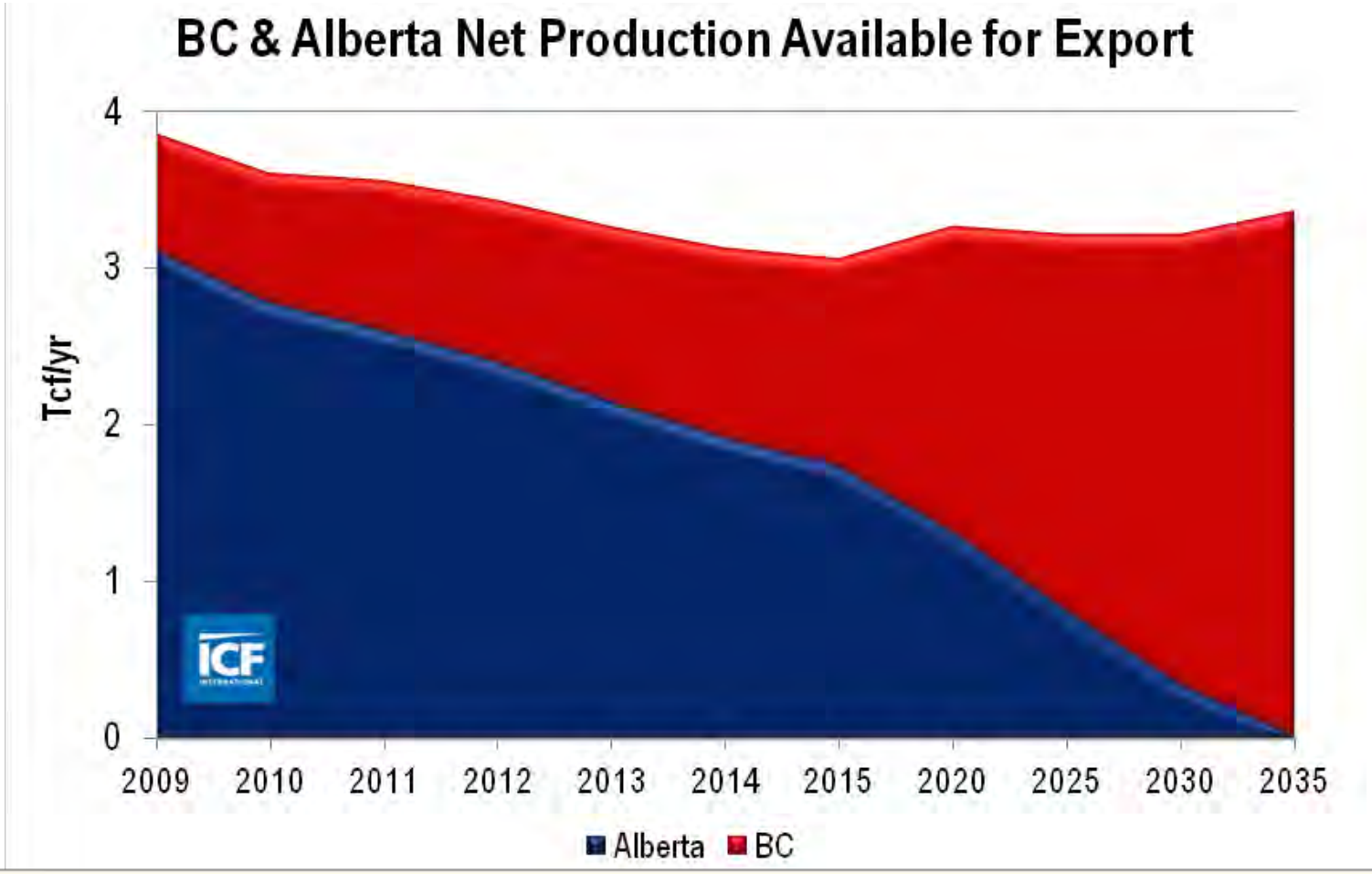


**Growing Horn River Shale & Montney Shale Production Not Consumed by Regional Demand Will be Searching for Paths to Other Markets**

# SET West

## $1.5 Billion British Columbia Expansion Program

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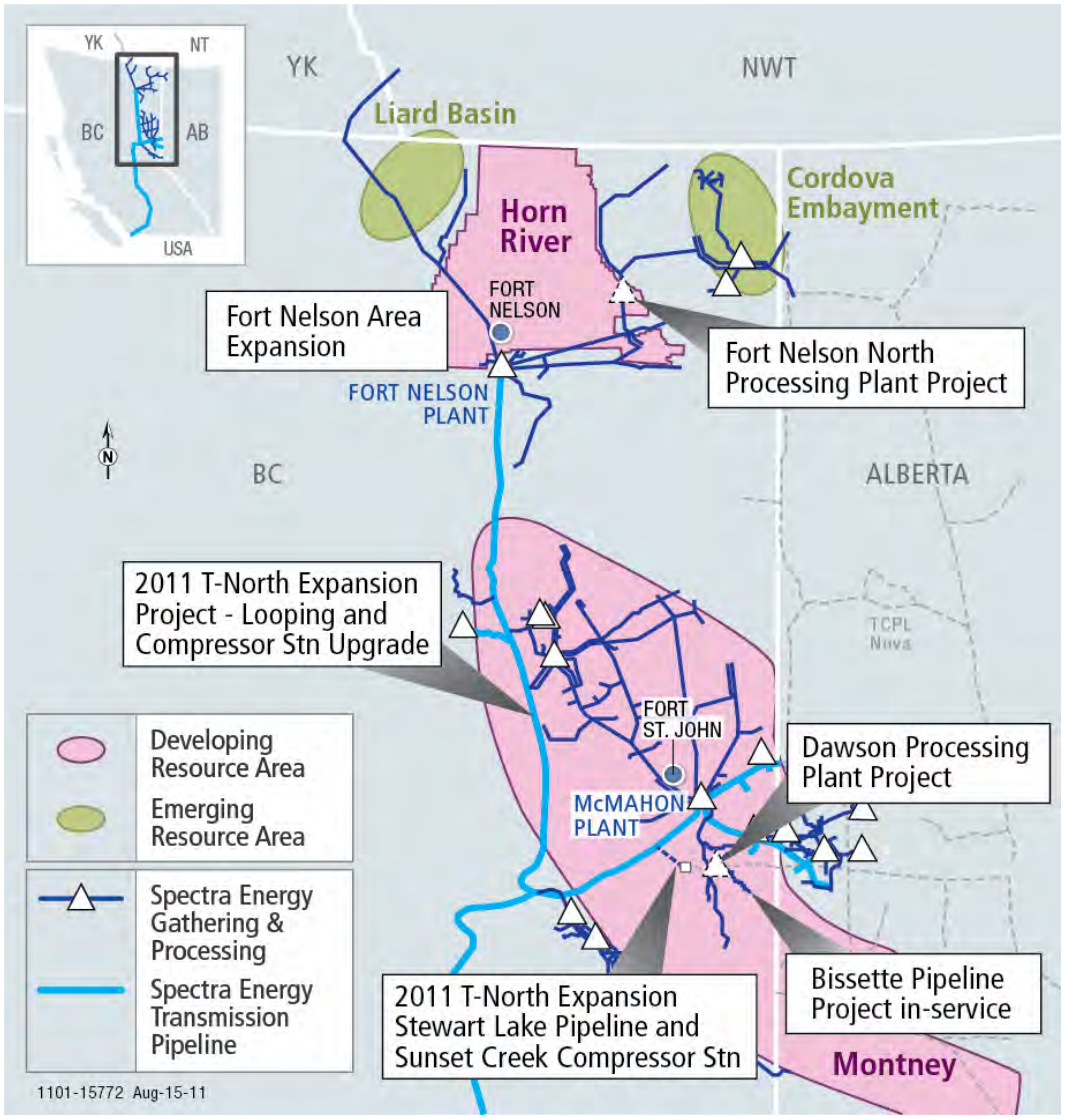


## Regional Development:

### Fort Nelson (Horn River)

- $1 billion capital investment underway
  - Fort Nelson plant fully contracted
  - 9 of 10 expansion projects now in service
  - New Fort Nelson North plant (2012)
  - T-North pipeline expansions underway
  - Further expansions expected post-2012

### Fort St. John (Montney)

- $500 million capital investment underway
  - McMahon plant at full capacity, Bissette Pipeline now in service
  - New Dawson plant (2 phases, 2011/13)
  - Further expansions in development

# Union Gas At a Glance

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## Distribution

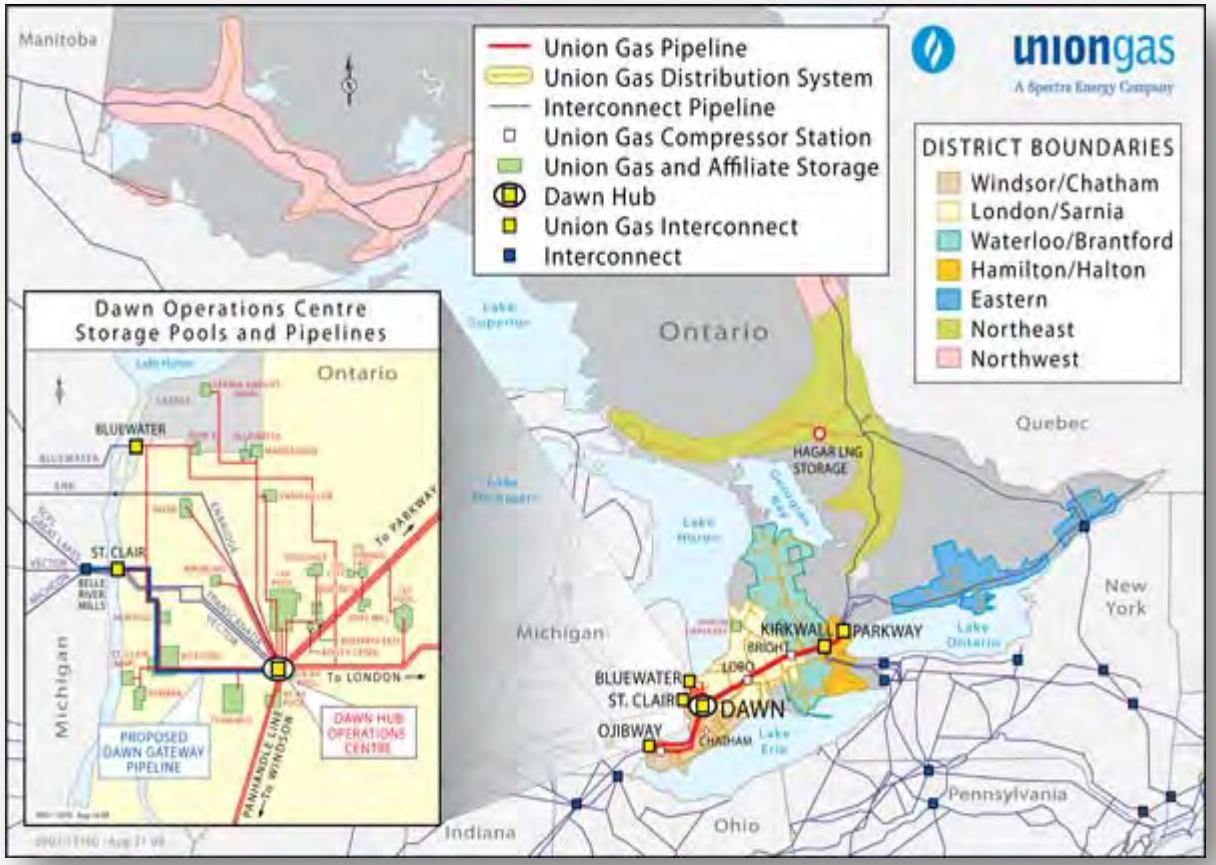
| | |
|---|---|
| **Retail Customers**: | 1.3 million |
| **Annual Throughput**: | 495 PJ |
| **Distribution Pipe**: | 65,363 km |

## Transmission

| | |
|---|---|
| **Capacity**: | 6.5 PJ/d |
| **Annual Throughput**: | 953 PJ |
| **Transmission Pipe**: | 4,743 km |
| **Markets Served**: | Ontario, Quebec, US Northeast |

## Dawn Storage

| | |
|---|---|
| **Storage**: | 166 PJ |
| **Peak Day Withdrawal**: | 2.8 PJ/d |
| **Peak Day Injections**: | 2.2 PJ/d |
| **Underground Facilities**: | 23 |
| **Markets Served**: | Ontario, Quebec, Marketers |



# Changing Market Fundamentals

## WCSB Conventional Decline & North American Shale Growth

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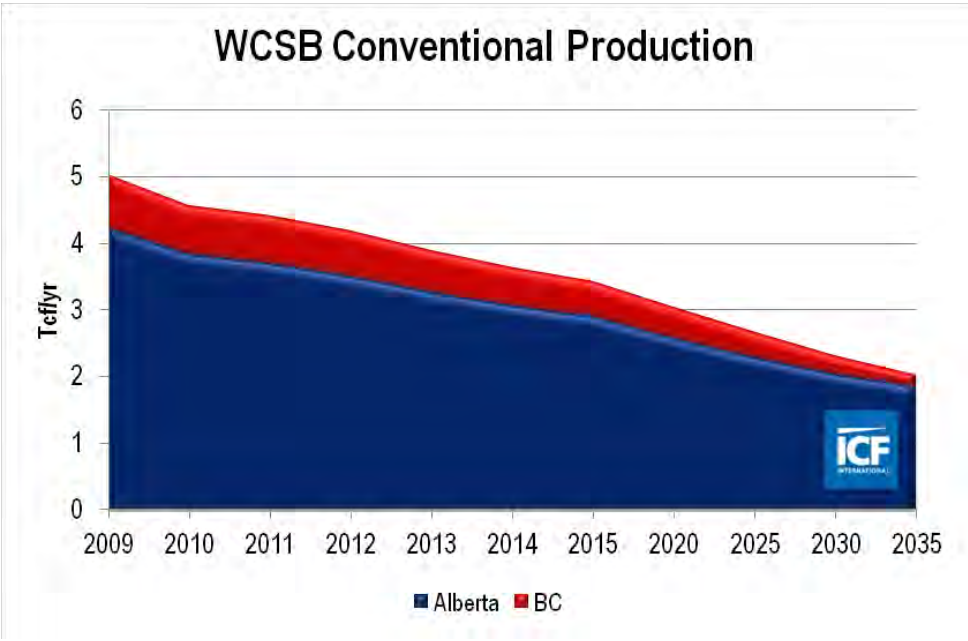
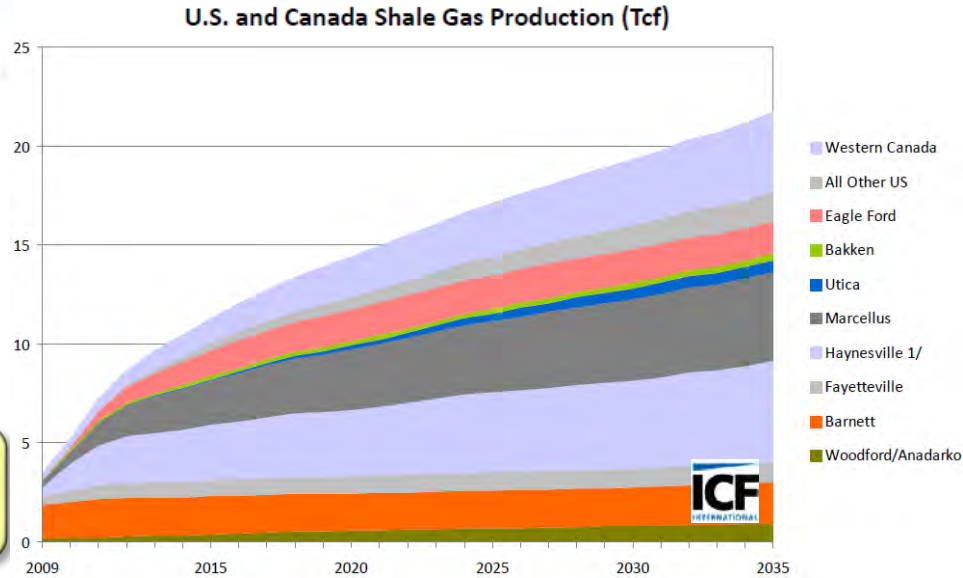



New Western Canadian Supply is Not Great Enough to Offset Production Declines, Satisfy Regional Demand, & Maintain Exports

New Technology Has Allowed Rapid Growth in Shale Gas Production

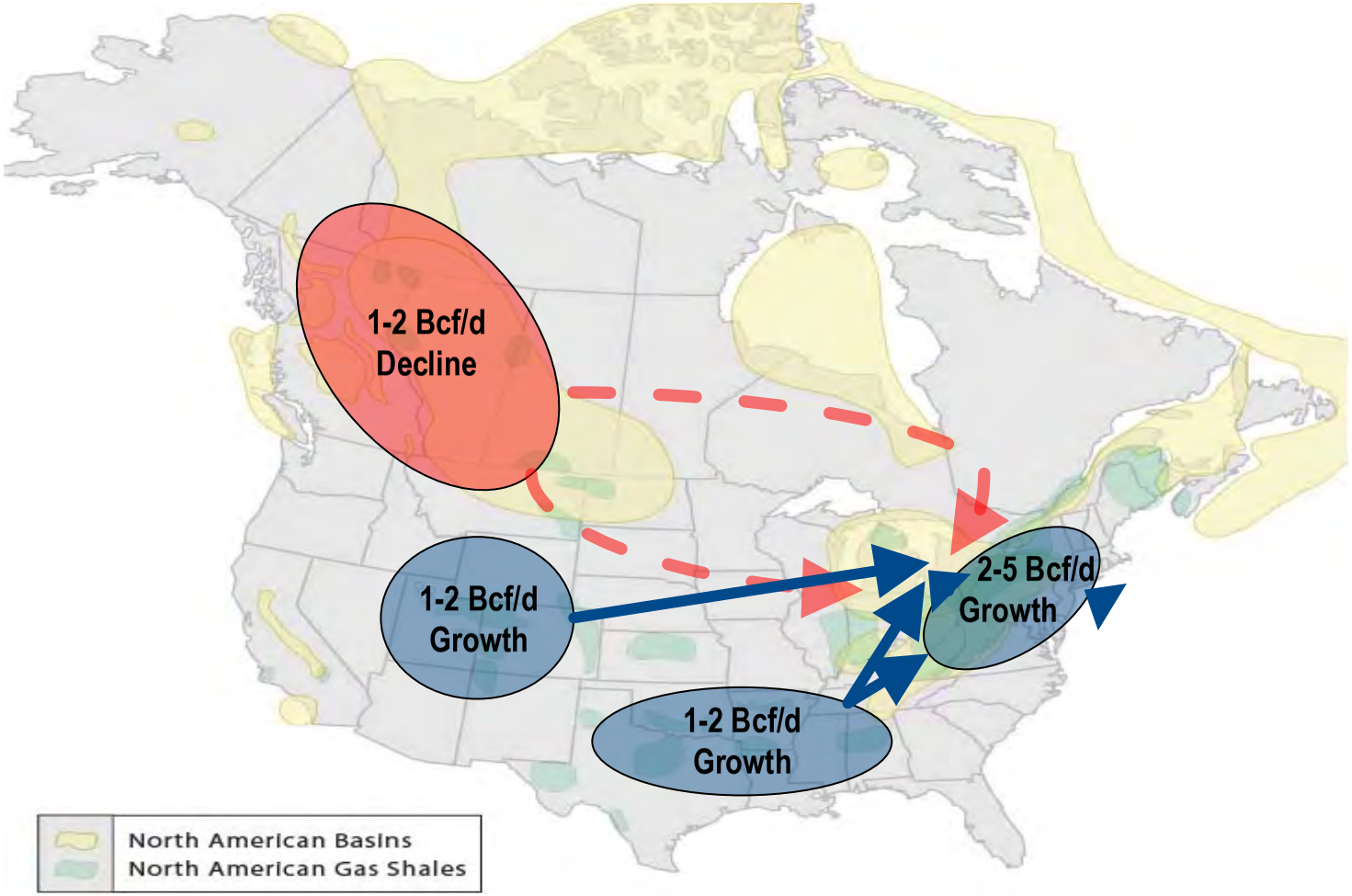



1/ Haynesville shale production includes production from other shales in the vicinity, e.g., the Bossier Shale.

# Changing Market Fundamentals

## Δ Supply Flows 2007 vs. 2015






**US Shale Gas is Positioned to Become Ontario's Predominant Supply Source**

# Changing Market Fundamentals

## TCPL - ↓Flows & ↑Tolls

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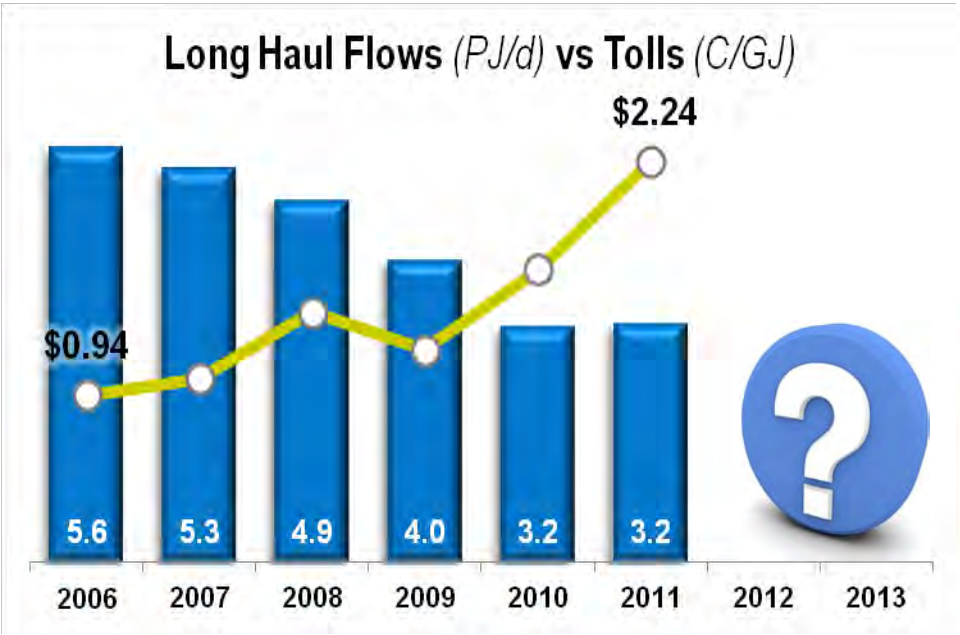


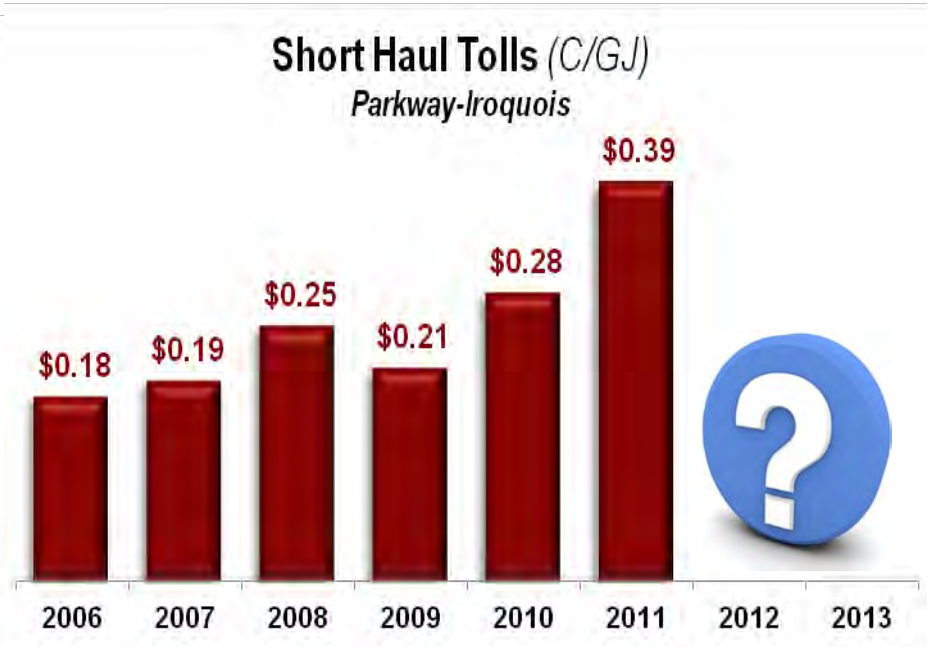


**Driven by Volume Declines**

**Driven by Creative Rate Design**

**Further De-Contracting on TransCanada Could Result in Continued Toll Instability – Once Valued Supply Routes Become Uneconomic**

# Changing Market Fundamentals
## TCPL - ↓Flows & ↑Tolls

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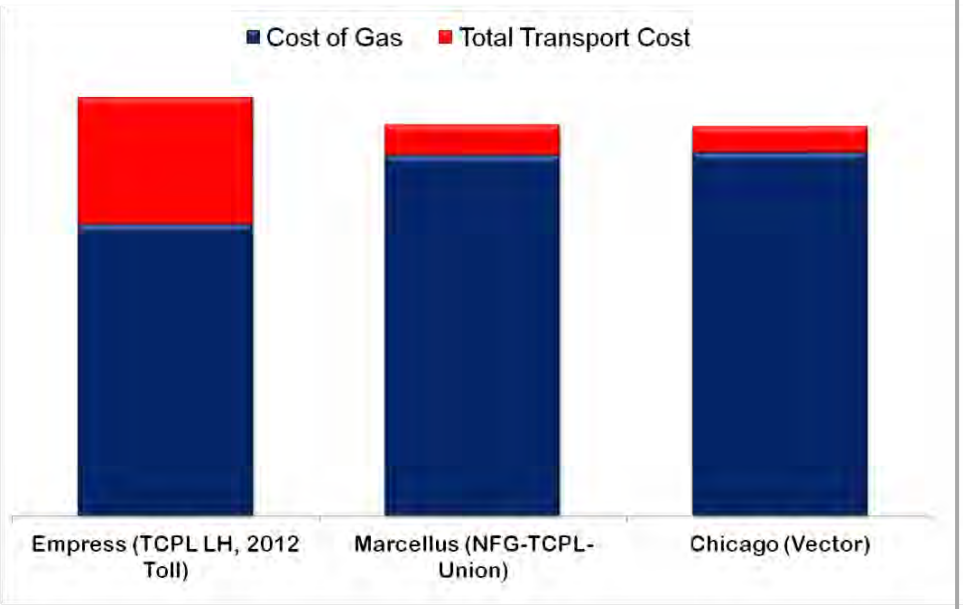
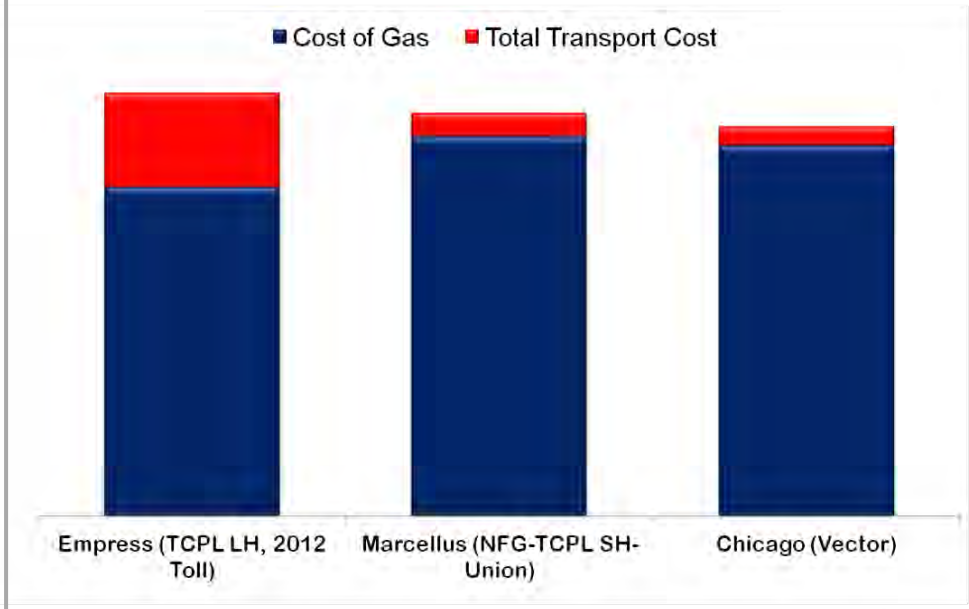
### ICE Trades - Calendar 2012
*(As of Nov 8th, '11)*




### ICF Forecast – 10 Year Average
*(October '11 Base Case)*




In Both Scenarios, TCPL Long Haul Lands at a ~$0.30/GJ Premium

**WCSB Gas Supply Shipped on the TCPL Mainline will Remain Uneconomic Compared to Mid-Continent and Eastern Supply Options**

# Changing Market Fundamentals
## Declining WCSB Meets Marcellus Growth

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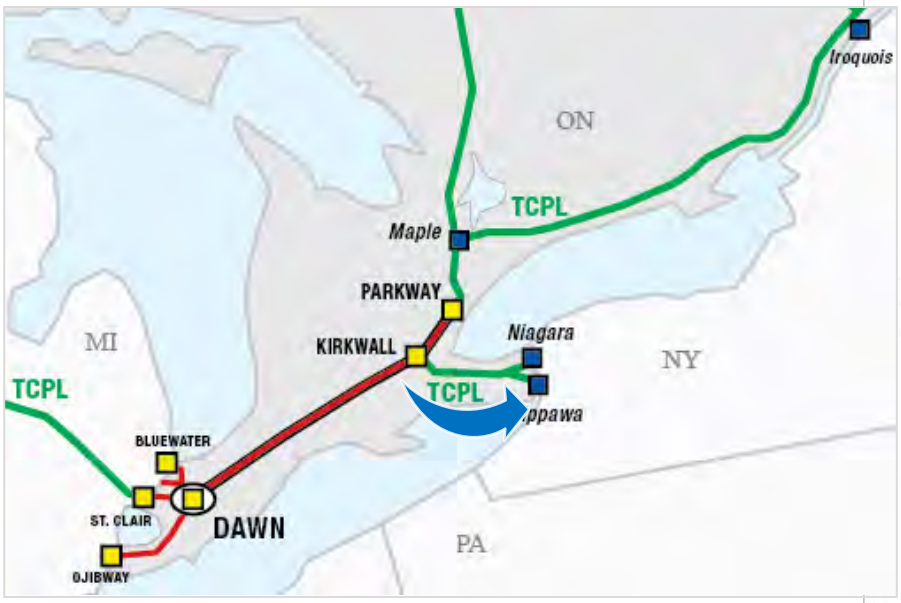


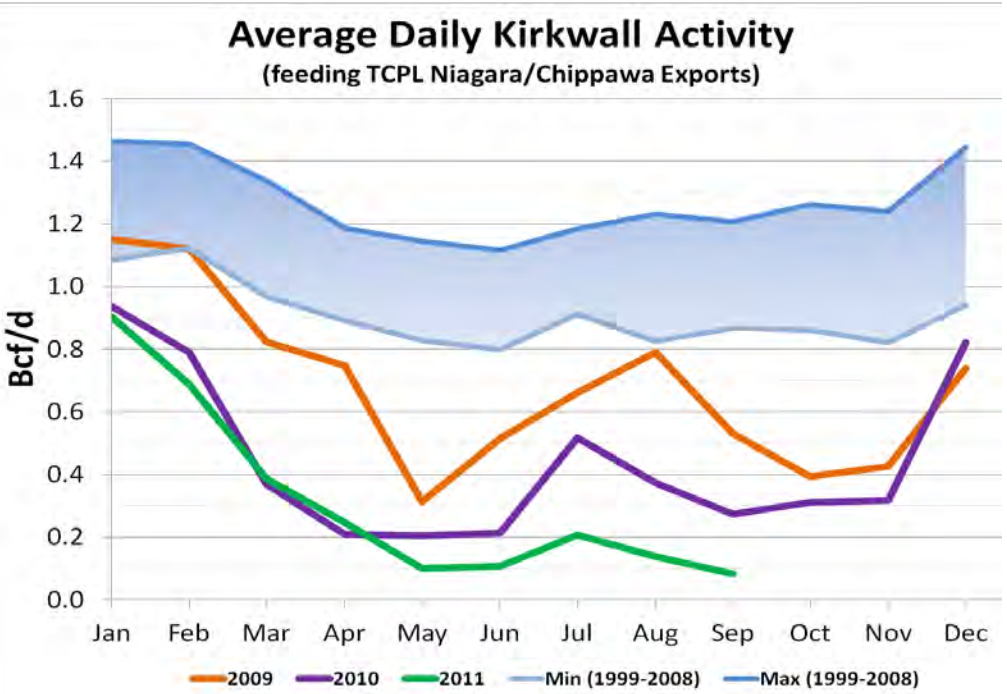


Between 2011-2013 Union Gas received ~900 TJ/day of Dawn-Kirkwall Turnback

**Increasing TCPL Mainline Tolls, Declining WCSB Production, & Rapid Growth of Marcellus Shale Production All Collide on the Union Gas System – Creating an Opportunity for Change**

# Union Gas Projects

## Kirkwall Flow Reversal: Supporting New Services

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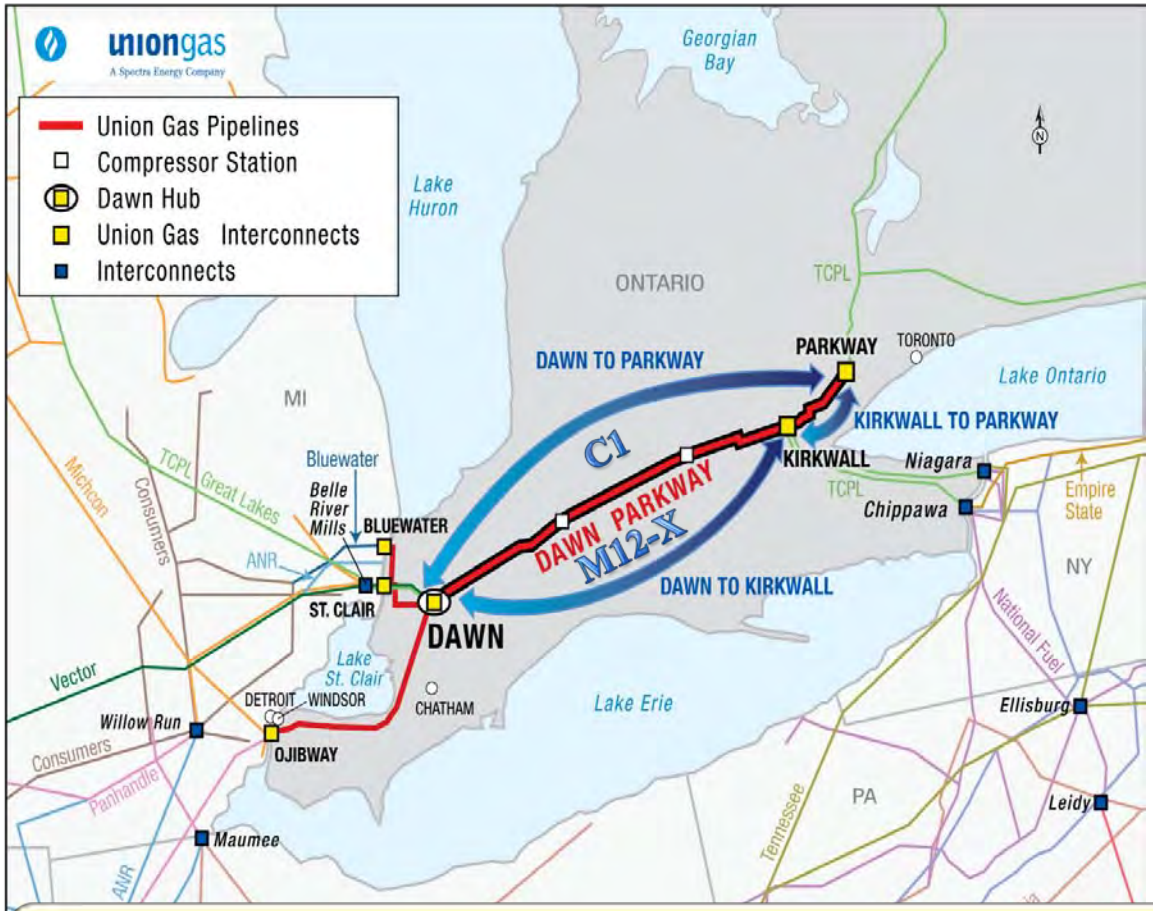



### C1 Kirkwall to Dawn

Point-to-point firm transportation that provides access to Dawn

### M12-X

Flexible service between any of Dawn, Parkway and Kirkwall, easterly or westerly, all on a firm basis

### C1 Kirkwall to Parkway

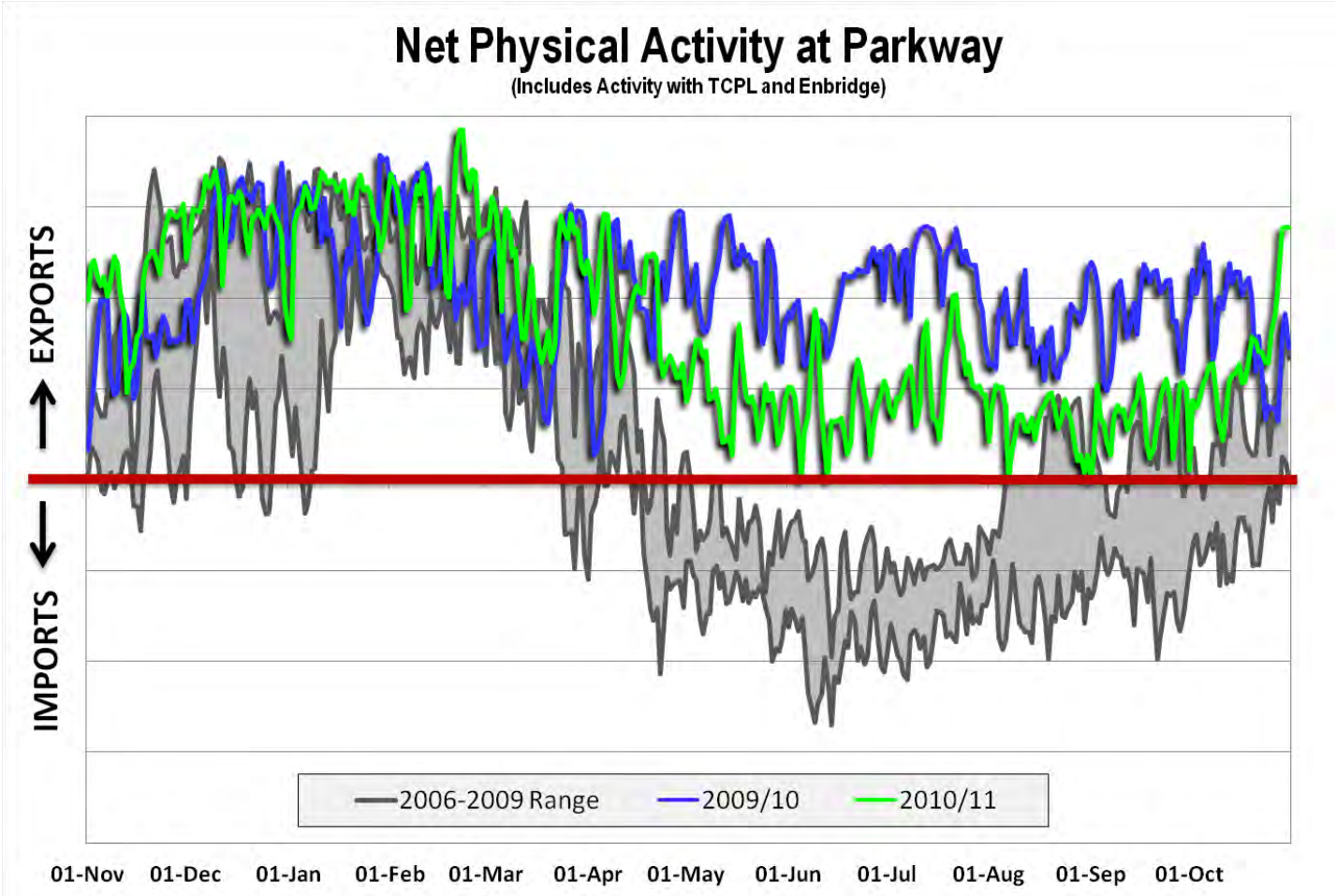
Point to point transportation between Kirkwall and Parkway.

**Kirkwall Reversal Allows Marcellus Gas to be Imported at Niagara and Chippawa & Enter the Union Gas System at Kirkwall (In Service Nov 1, 2012)**

# Changing Market Fundamentals

## Intra-Provincial Flow Shift






**Parkway has Become a Year Round Export Point**

# Union Gas Projects
## Parkway Reinforcement

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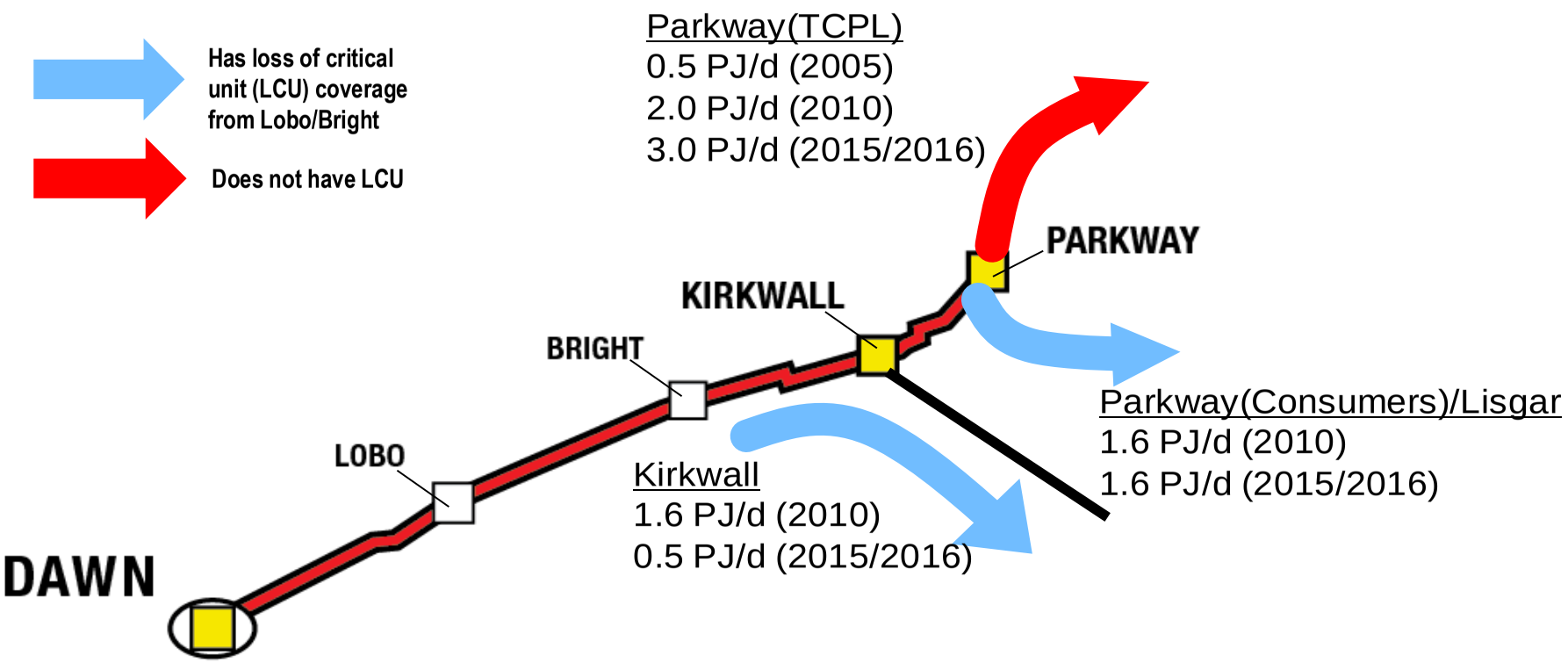
### Dawn to Parkway System – Changing Operations and Throughput (1)




(1) Design day throughput.

**As Flows on Union's System have Changed, the Importance of Protecting Volumes Through Parkway Compression Becomes Paramount.**

# Union Gas Projects
## Parkway Reinforcement (Parkway West)



- With increased reliance on Parkway compression service, need to provide Loss of Critical Unit (LCU) protection at Parkway
- Upgrade existing metering to custody transfer level into TCPL
- Develop a new station, complete with:
  - New metering
  - Install 2 new 20,000 HP compressors to complete LCU
  - Full emergency bypass piping - would allow gas to be re-routed in the event of any single emergency
- Metering and bypass piping completed for 2013; LCU in 2014

**The Reliability of the Union Gas Transmission System will be Maintained & Enhanced to Support Current & Future Throughput**

# Changing Market Fundamentals

## The Importance of Parkway to Maple

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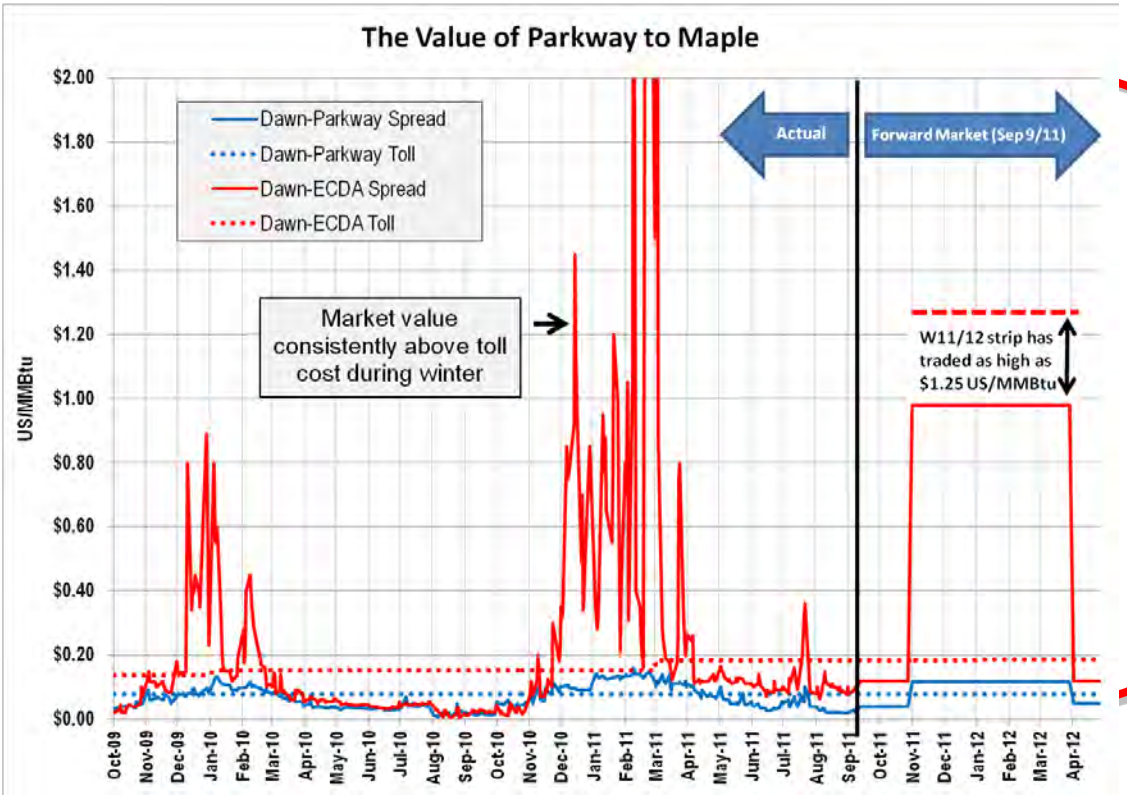
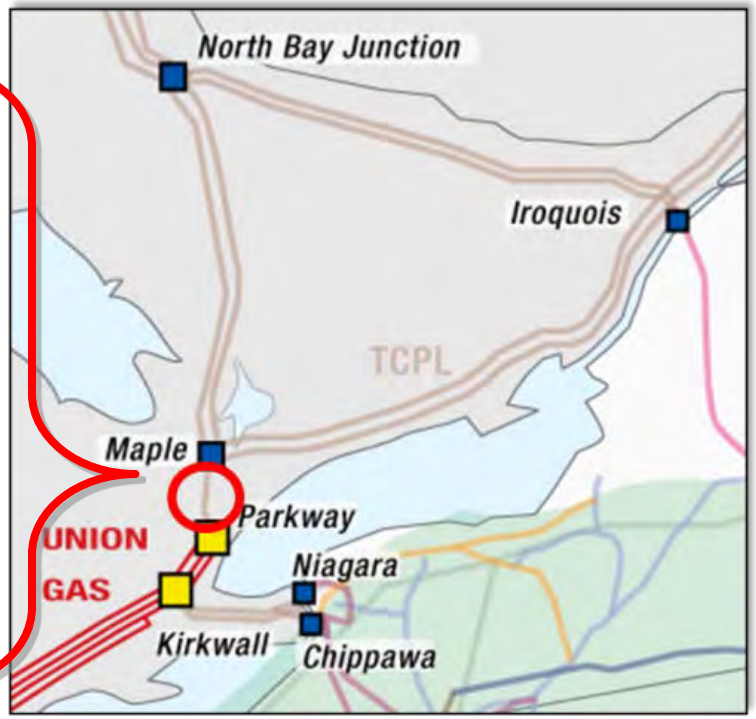


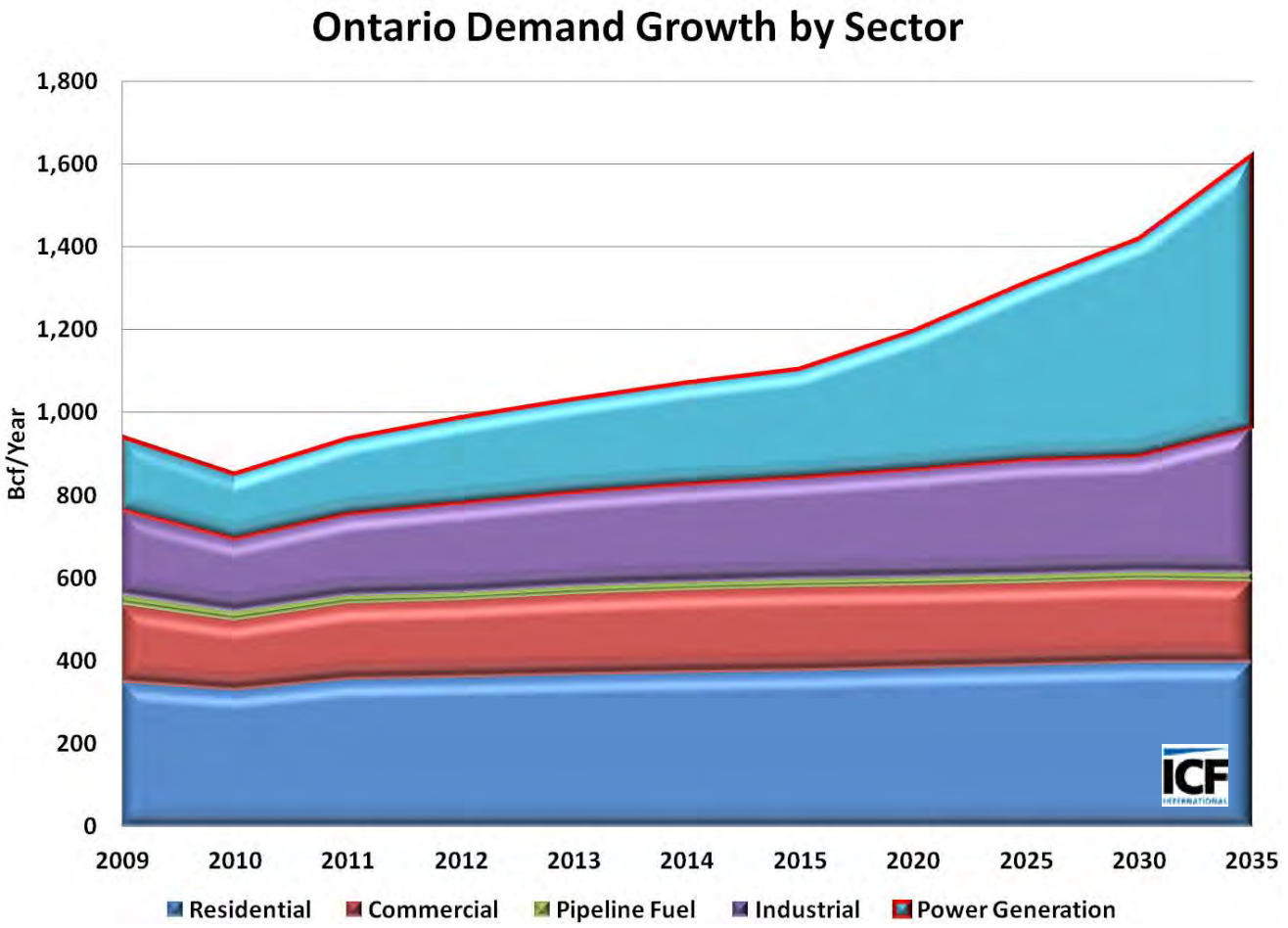




**Ontario Needs Debottlenecking & Toll Stability to Bring US and Canadian Unconventional Supply Through Dawn & Kirkwall to Markets Further East**

# Ontario Demand

## Driven by Power Generation Growth






**Ontario Gas Demand Growth Will be Driven by Power Generation & Some Industrial Demand in the Future**

# Ontario Electricity Generation

## The Evolution of Demand

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FIRM

IT ?

Total 3062 MW

Total 4200 MW

Total 8,500 MW

Total 12,500 MW

Total 14,900 MW

**OPG Lennox**

**Non-Utility Generators 1990 – '99**

**Ontario Electricity Market Open 2003 – '04**
- Brighton Beach
- TransAlta

**Clean Energy Supply & Combined Heat & Power**
- Portlands Energy Centre
- Goreway Station
- Halton Hills Generating Station
- Greenfield Energy
- St. Clair Energy Centre
- Thorold CoGen

**Coal Conversions?**
- Thunder Bay, Nanticoke, Lambton

**Cambridge Peaker?**

**CHP?**

**Potential 2017 – '20**

**Nuclear Uncertainty?**

**Demand Uncertainty?**

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# Meeting the Needs of an Evolving Market

Jim Redford
Director, Business Development and Strategic Accounts
March 6, 2012

Filed: 2012-05-04
EB-2011-0210
J.B-1-7-8
Attachment 4

# Safe Harbour Statement

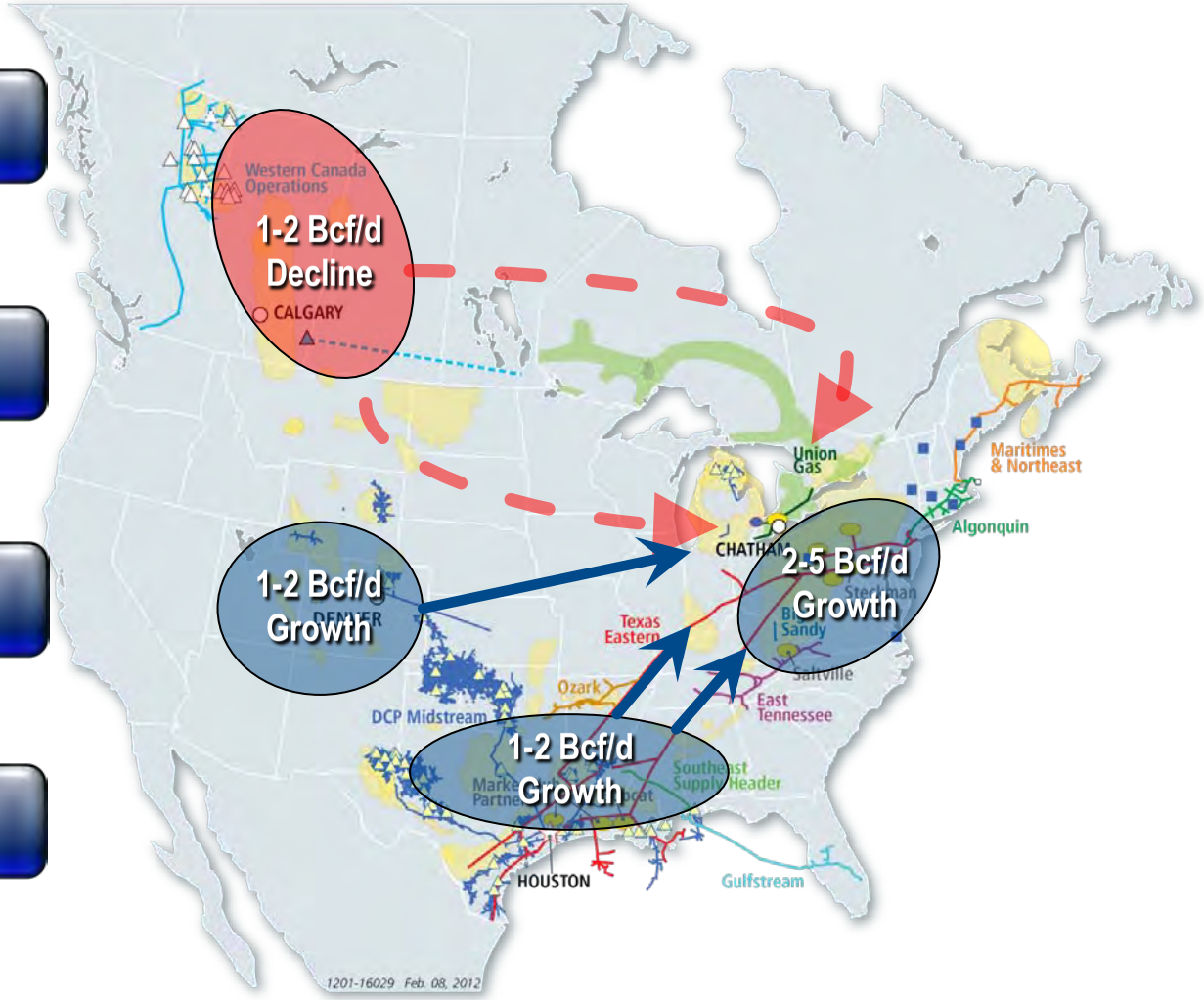
Some of the statements in this document concerning future company performance will be forward-looking within the meanings of the securities laws. Actual results may materially differ from those discussed in these forward-looking statements, and you should refer to the additional information contained in Spectra Energy's Form 10-K and other filings made with the SEC concerning factors that could cause those results to be different than contemplated in today's discussion.

## Reg G Disclosure

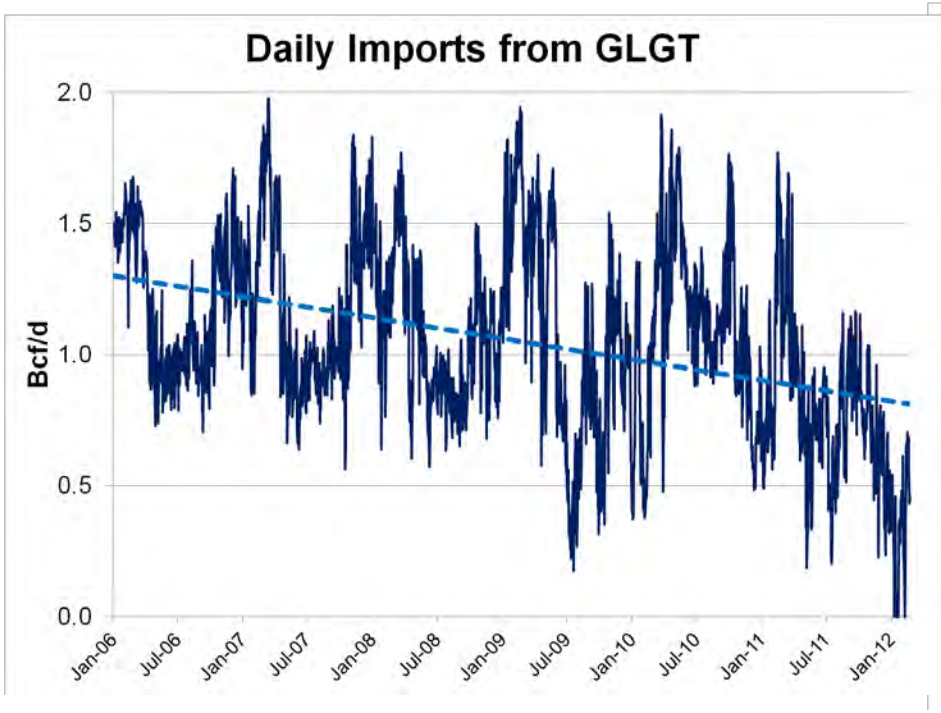
In addition, today's discussion includes certain non-GAAP financial measures as defined under SEC Regulation G. A reconciliation of those measures to the most directly comparable GAAP measures is available on our website.

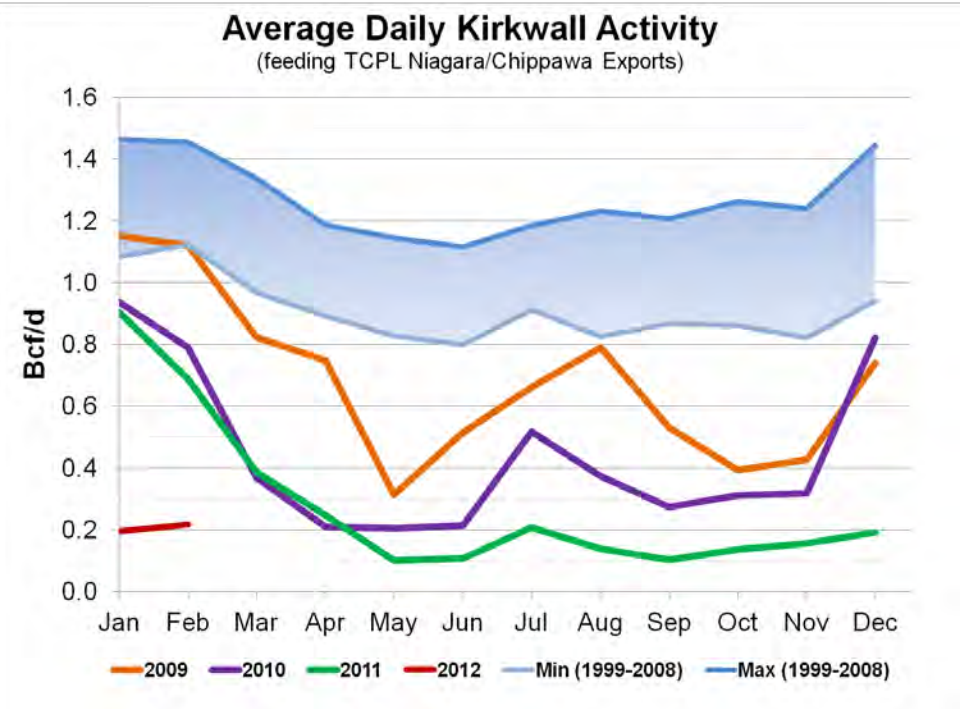
# Agenda

- Evolving Market Fundamentals
- Growth Projects
- Current Open Seasons
- Customer Experience Initiatives



# Changing Flows Into and Out of Dawn

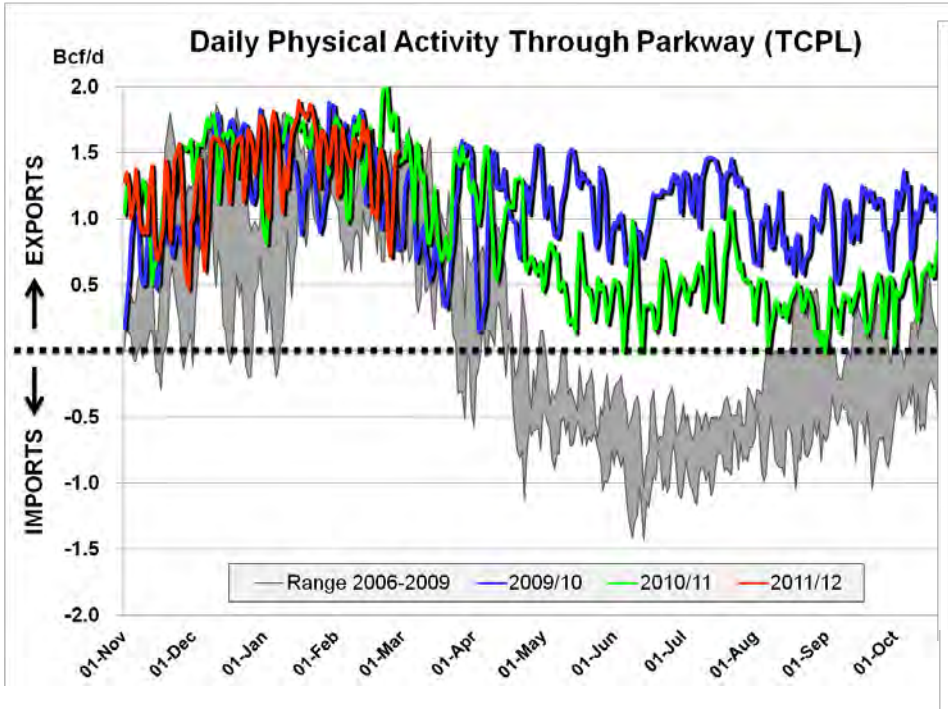


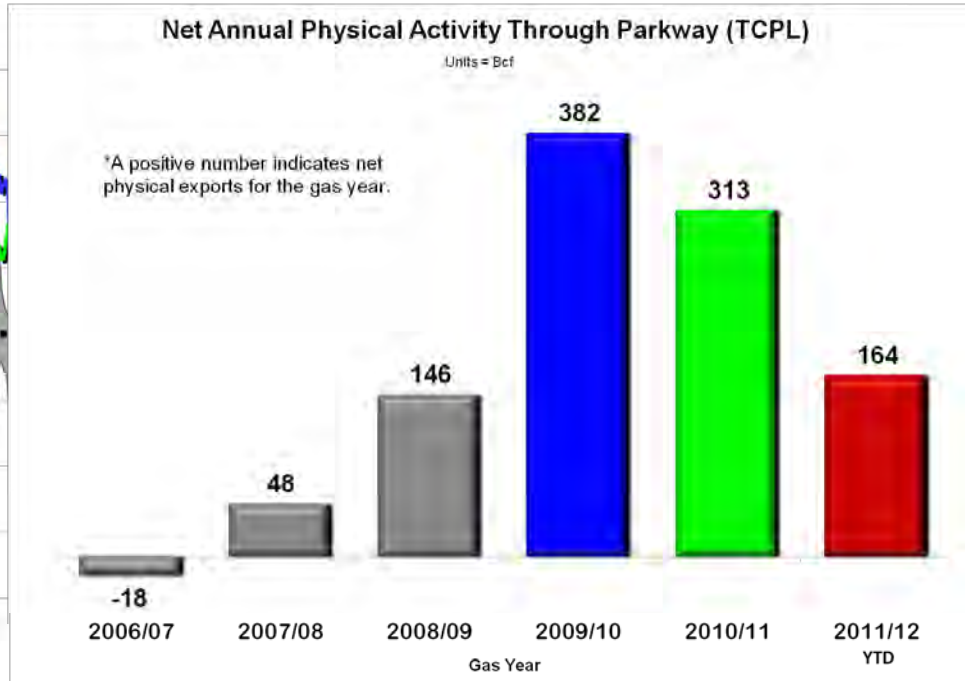




This past winter we have seen exports from Dawn into Great Lakes for the first time

Exports through Kirkwall continue to drop off significantly

# Increased Flows Through Parkway

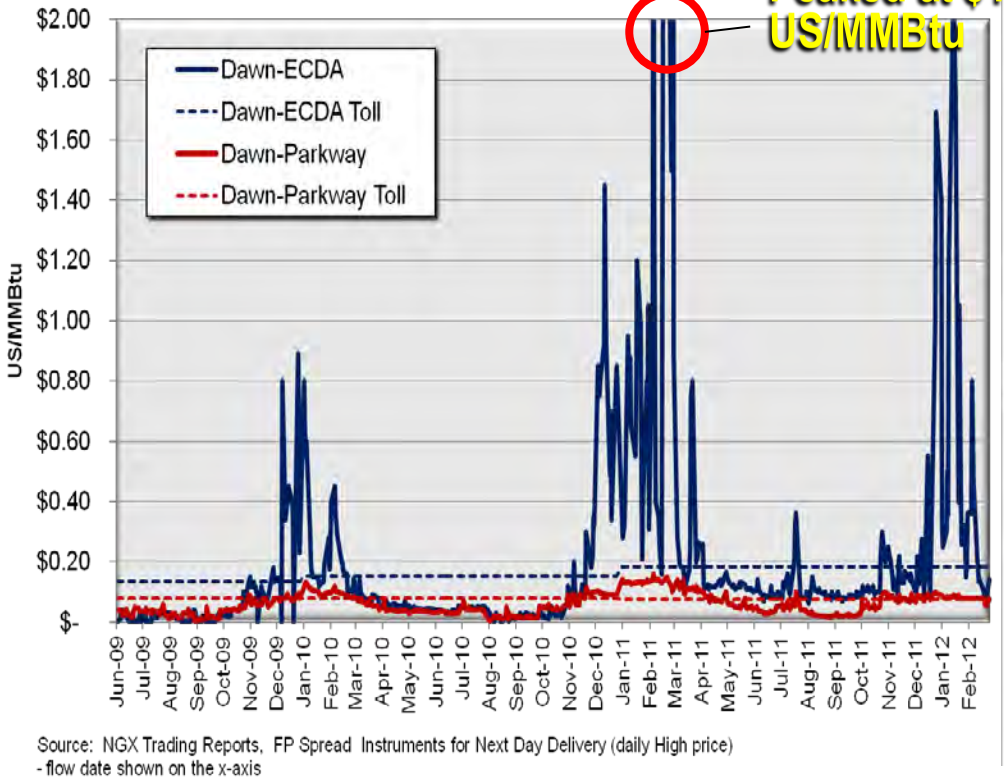



As Western Canadian gas deliveries to Parkway have decreased, exports from Dawn to markets in Ontario, Quebec and the U.S Northeast through Parkway have changed to a year-round basis with annual net volumes increasing dramatically

# The Parkway to Maple Constraint

## Cash Market




Source: NGX Trading Reports, FP Spread Instruments for Next Day Delivery (daily High price)
- flow date shown on the x-axis

## Forward Market


Source: NGX Trading Reports, FP Spread Instruments for Next Day Delivery (daily High price)
- flow date shown on the x-axis

The Dawn-Enbridge CDA spread in the Cash and Forward markets continues to trade at a significant premium to tolls

# Growing Marcellus Production

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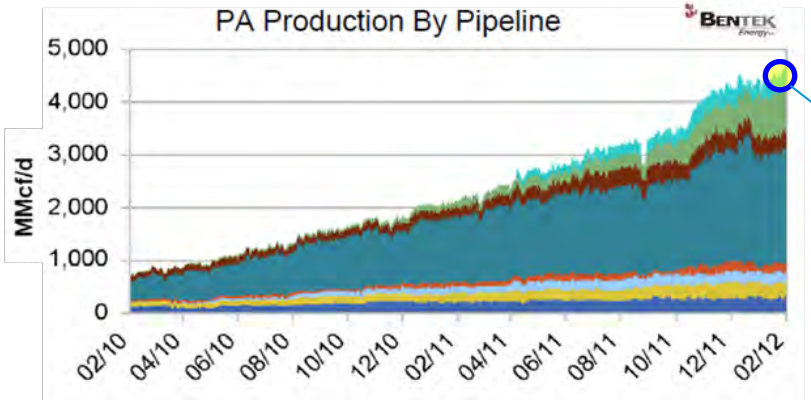
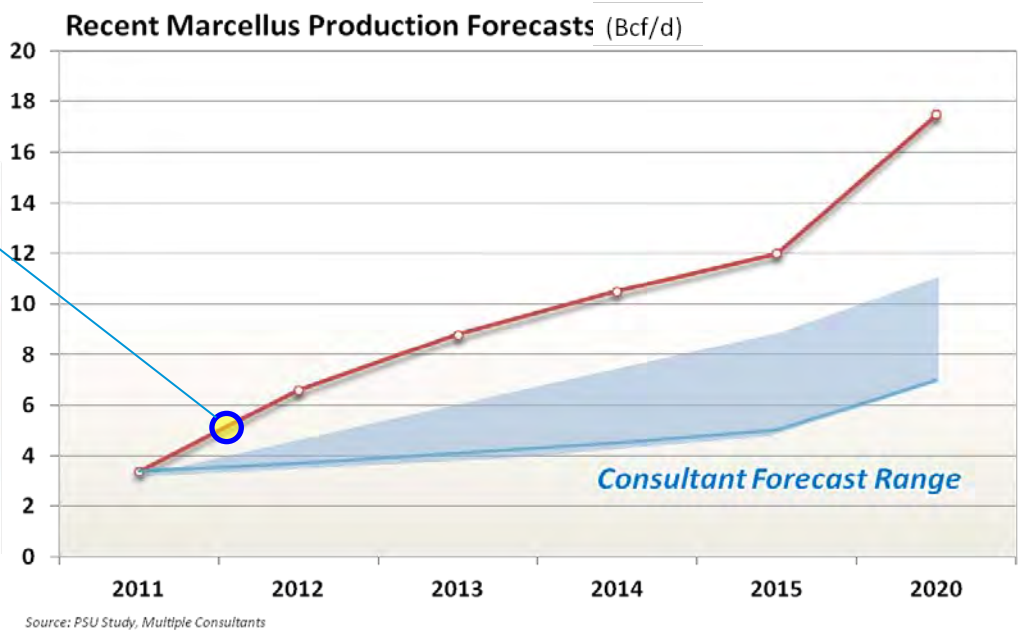
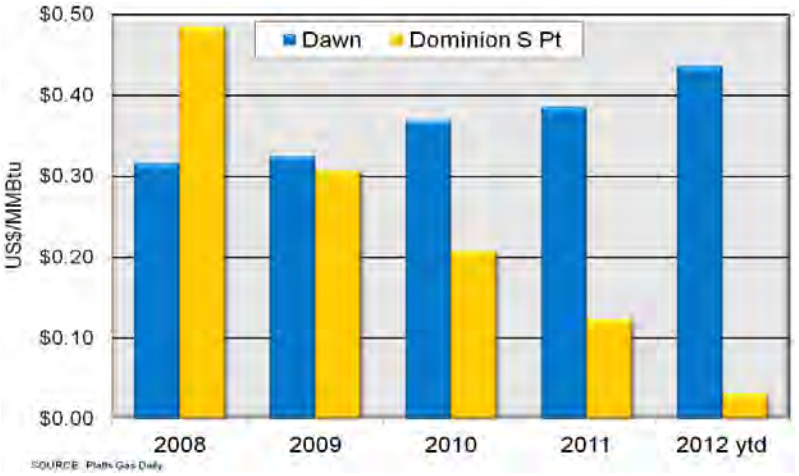
Marcellus region supply continues to strengthen and outperform forecasts



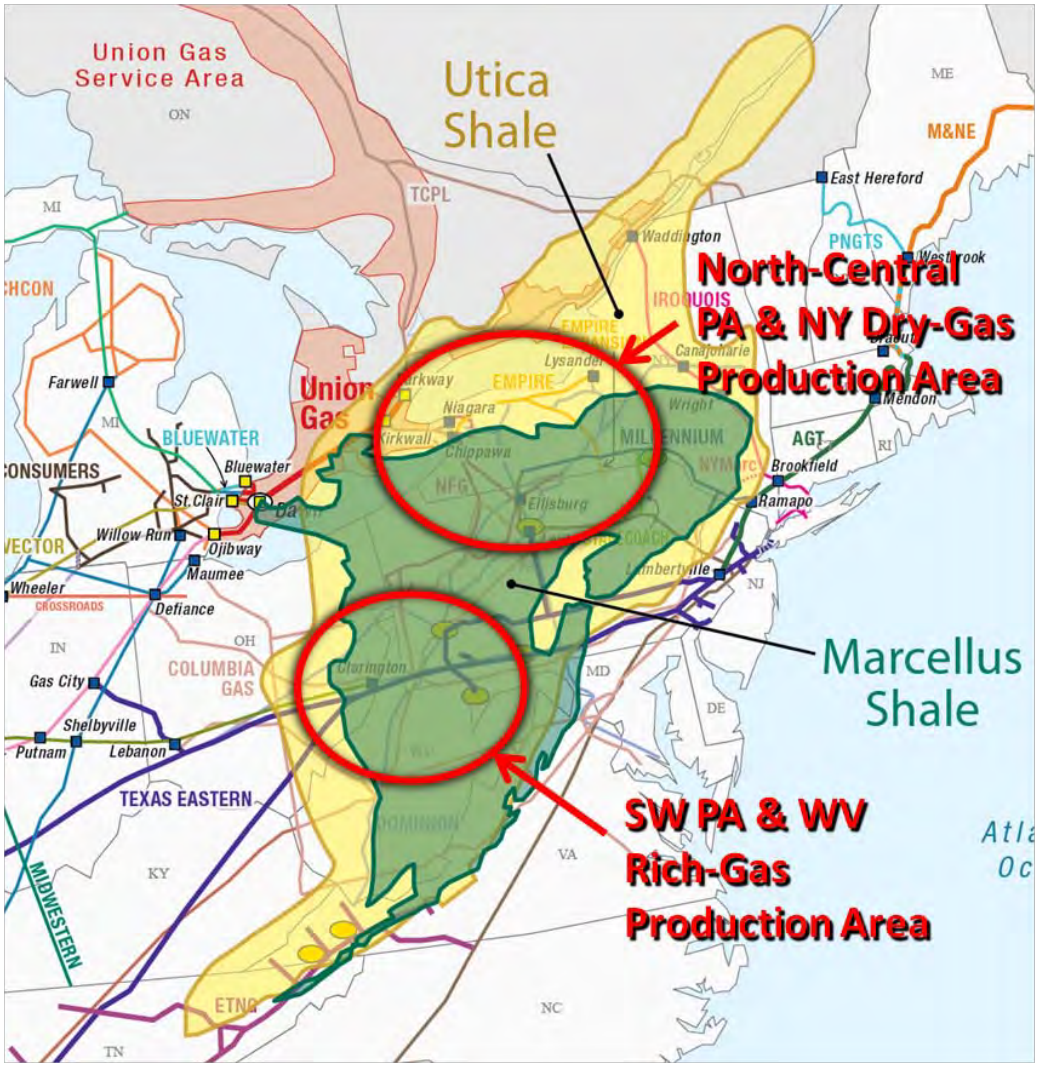




Marcellus and other unconventional gas supply will replace declining conventional WCSB supply into the Dawn Hub

# Marcellus and Utica Supply Potential

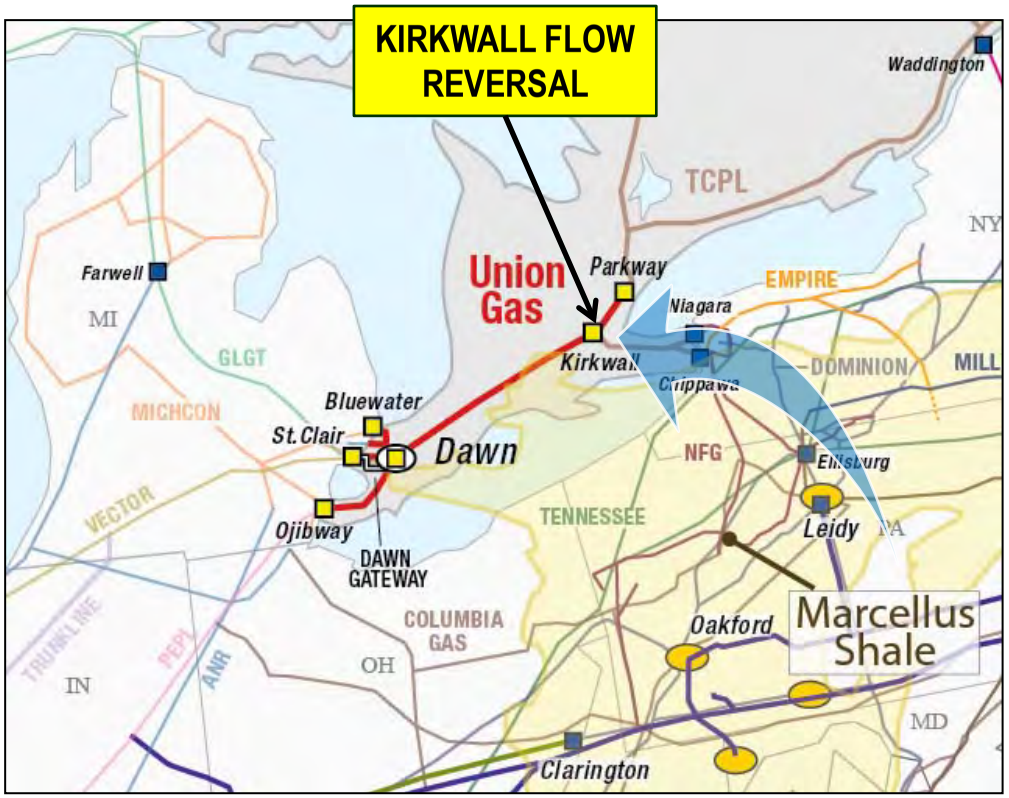
- Marcellus gas will first access Dawn through Niagara and Chippawa from the dry-gas production area in North-Central Pennsylvania
- Rich-gas production in the Marcellus (Southwest PA/WV) and the emerging Utica (Eastern OH/Western PA) is growing rapidly with the development of Appalachian midstream assets
- The value of the natural gas liquids makes rich-gas production economics significantly better than dry-gas production economics
- Rich-gas production in the Marcellus and Utica is expected to eventually be an economic supply source for the Dawn Hub



# Growth Projects

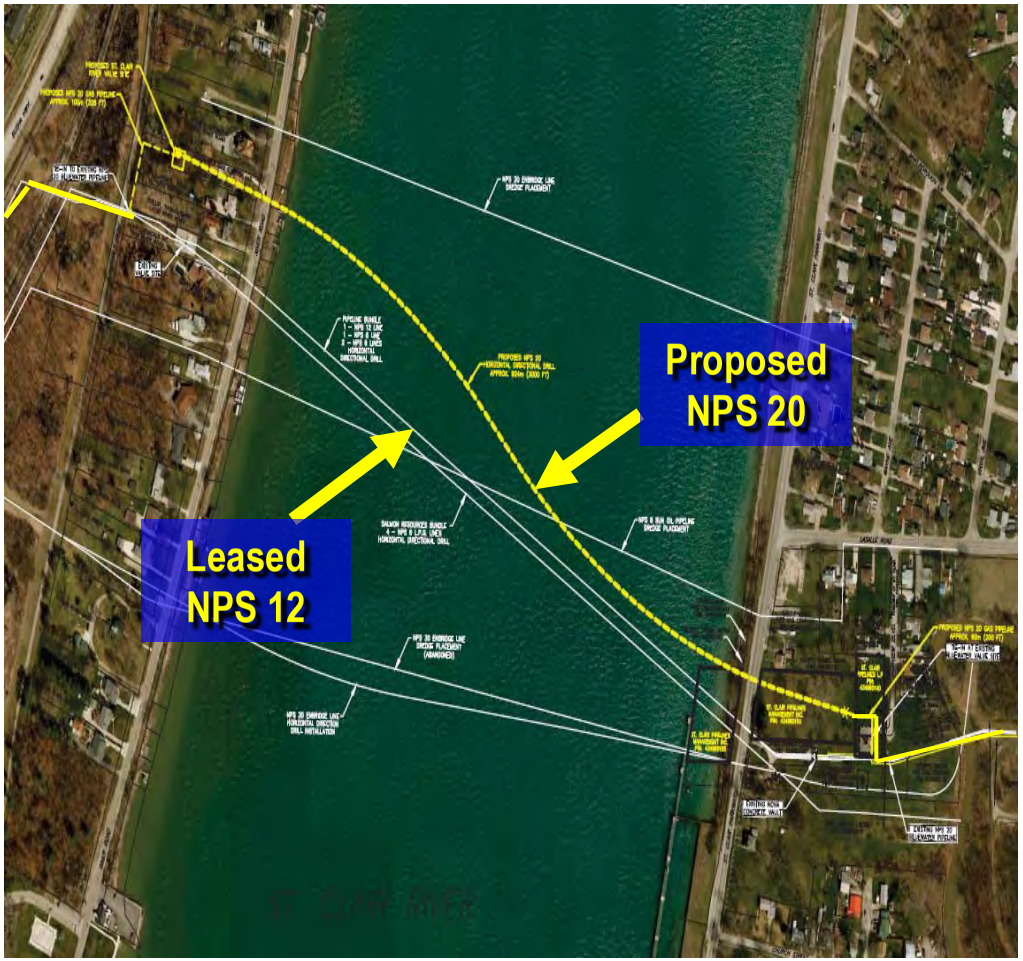
# Kirkwall Flow Reversal

- Addition of 42” valves , piping and controls to allow for bi-directional  flow through the Kirkwall Custody Transfer Station
- Required for Marcellus gas supply to access the Dawn-Parkway system
- Kirkwall to become a receipt and delivery point
- $4.7 million estimated capital cost
- November 1, 2012 in-service



# Bluewater River Crossing Replacement

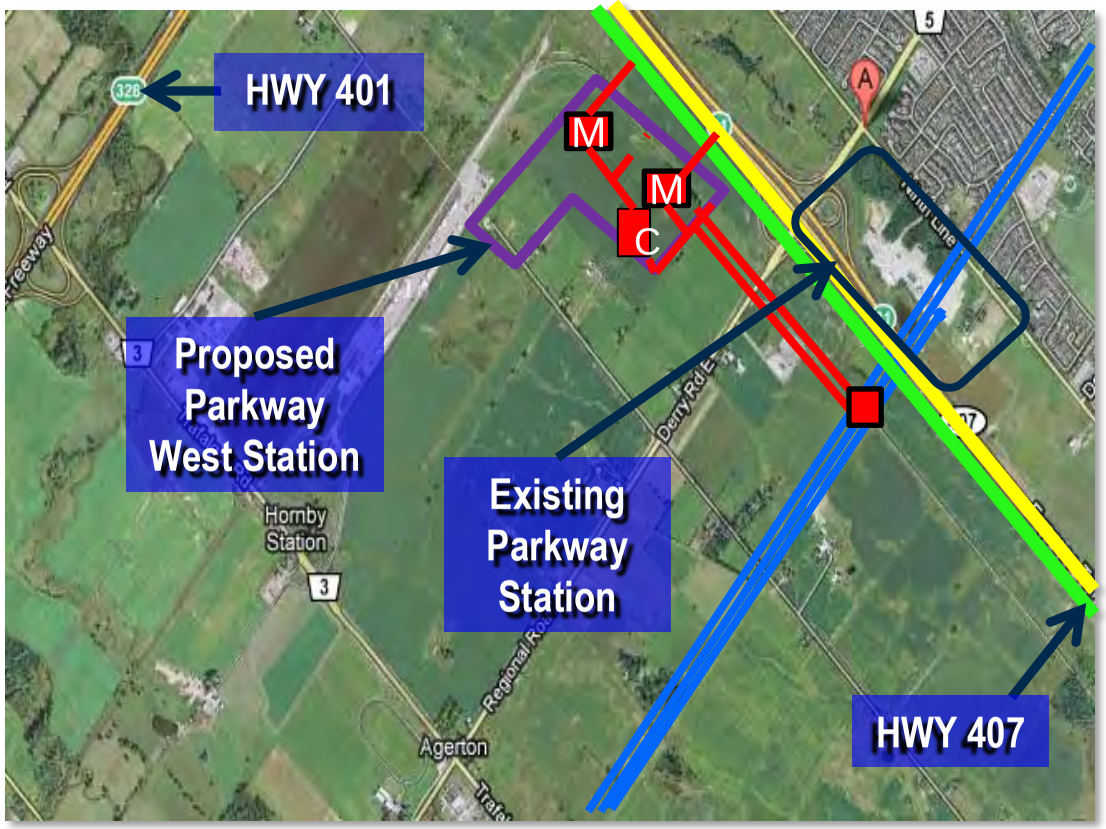
- Bluewater Pipeline owned by St. Clair Pipelines and Bluewater Gas Storage connects Michigan and Ontario
- Current lease agreement for river crossing terminates January 2013
- New directionally drilled river crossing being installed to continue service between Michigan and Dawn
- 20” pipe provides capacity of approximately 250,000 GJ/d
- Filed for NEB approvals February 17, 2012
- $4.9 million estimated capital cost
- January 2013 in-service



# Parkway West

- Parkway Compression utilization has increased significantly since 2009 and shifted to year-round exports
  - Peak day exports increased from <0.5 Bcf/d in 2005 to 1.9 Bcf/d in 2011
  - Parkway only compression location on Dawn-Parkway system without full Loss of Critical Unit (LCU) protection
- Significant amount of peak day Greater Toronto Area (GTA) volumes flow through Parkway or are delivered at Parkway
  - 1.6 Bcf/d peak day delivered to Enbridge on suction side of Parkway
- Reliability project at Parkway that will provide:
  - Security of supply for markets east of Parkway, including the GTA
  - Operation and maintenance flexibility

# Parkway West

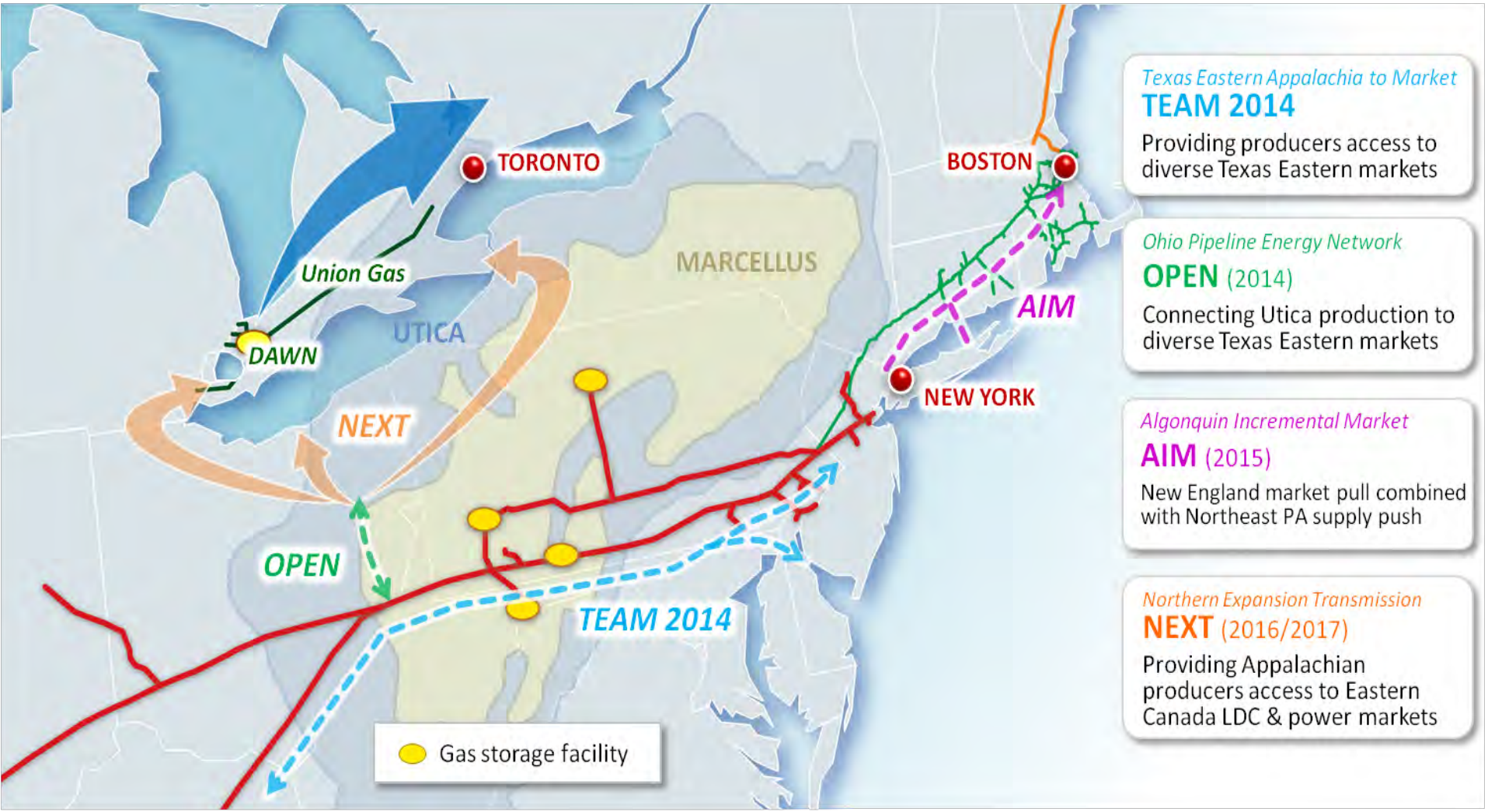



## Proposed Parkway West Facilities:

- Valve site connection to the Dawn-Parkway system
- Header system to connect valve site to Parkway West station
- LCU compressor unit (47,000 HP), metering and TCPL interconnect
- Metering and Enbridge interconnection
- $220 million estimated capital cost
- Included in 2013 rate filing
- November 1, 2014 in-service

**Parkway West enhances the reliability of deliveries for markets east of Parkway**

# Northern Expansion Transmission (NEXT)
# Connecting Appalachian Gas to Ontario



# NEXT Project

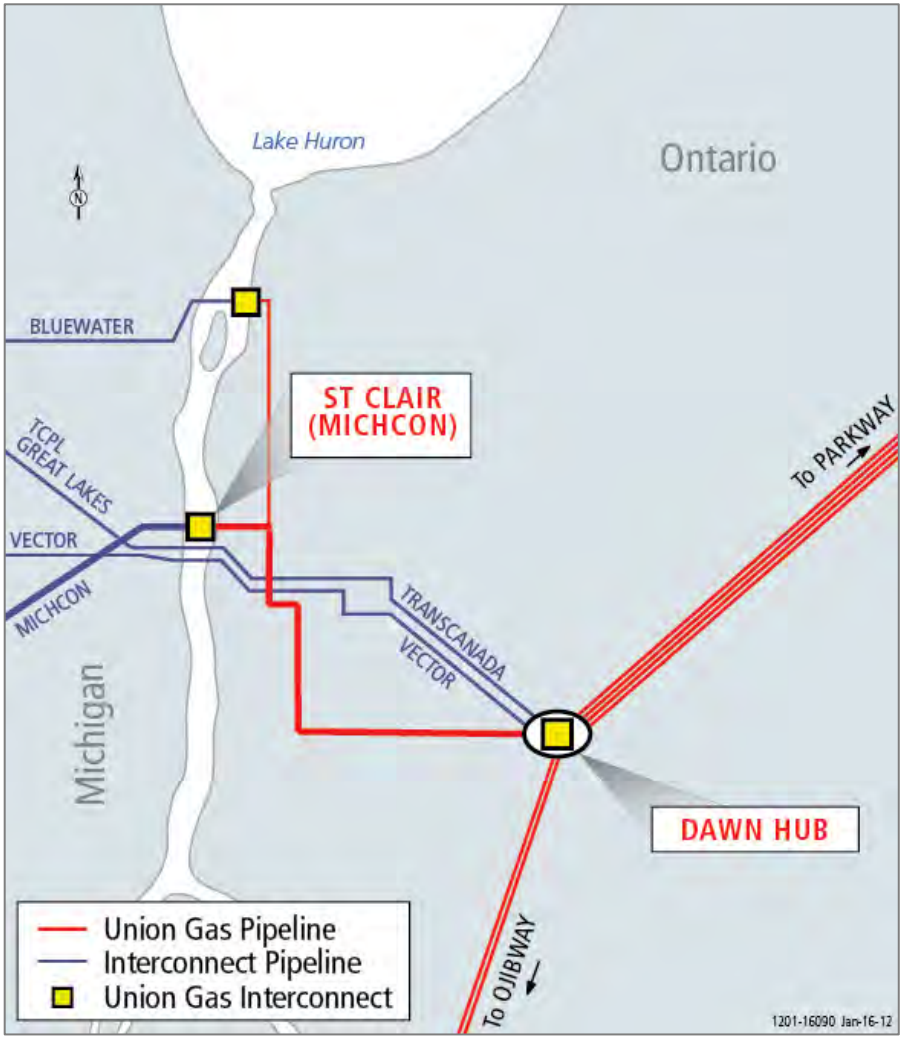
- Pipeline connecting Utica and Marcellus production (plus other potential supply) directly to the Dawn Hub
- Significant natural gas production potential in close proximity to the Dawn Hub
- New supply that will support the liquidity and health of the Dawn Hub
- Will serve the growing markets of eastern Canada – local distribution companies and power generators
- Opportunity for Marcellus and Utica production to be part of supply portfolio restructuring as a result of changing WCSB supply and transportation dynamics
  - Increases diversity and security of supply
  - Access to economic, competitive supply
- Supports the development of new infrastructure to serve growing natural gas demand in Ontario
- Targeting 2016 in-service

**For more information regarding the NEXT project please contact:**

**Richard Terrazas (713) 627-4604 RJTerrazas@spectraenergy.com**

# Current Open Seasons

# Open Season – St. Clair to Dawn




## St. Clair to Dawn

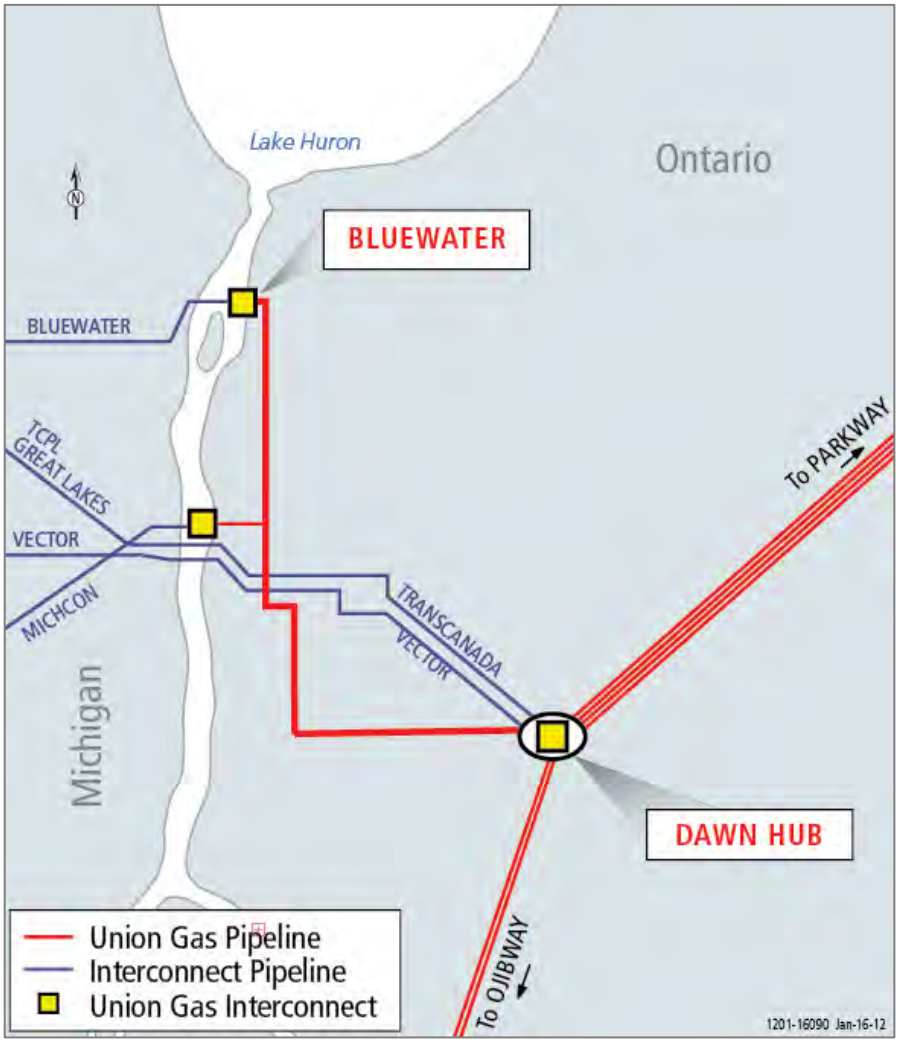
- Up to 180,000 MMBtu/d available
- Start Date: Apr 1, 2012
- Term: 1 year or greater
- Receipt Point: St. Clair (MichCon)
- Delivery Point: Dawn
- Rate: Minimum Demand Charge per Union's C1 Rate Schedule
- Commodity: No commodity charges apply
- Fuel: In Kind per Union's C1 Rate Schedule

**CLOSES March 9, 2012 – 12 noon EST/11am CST**

Contact Us:

| | |
|---|---|
| Jacquie Montgomery | (519) 436-5452 |
| Paolo Mastronardi | (519) 436-5264 |
| Michael Cadotte | (519) 436-5311 |
| Leah Moss | (713) 627-5054 |

# Open Season – Bluewater to Dawn




## Bluewater to Dawn

- Up to 140,000 MMBtu/d available
- Start Date: Nov 1, 2013
- Term: 1 year or greater
- Receipt Point: Bluewater (BGS)
- Delivery Point: Dawn
- Rate: Minimum Demand Charge per Union's C1 Rate Schedule
- Commodity: No commodity charges apply
- Fuel: In Kind per Union's C1 Rate Schedule

**CLOSES March 12, 2012 – 12 noon EST/11am CST**

Contact Us:

| | |
|---|---|
| Jacquie Montgomery | (519) 436-5452 |
| Paolo Mastronardi | (519) 436-5264 |
| Michael Cadotte | (519) 436-5311 |
| Leah Moss | (713) 627-5054 |

# Communications and Customer Experience

# Customer Focused Initiatives

- **Mobile Content** – Feedback provided by our customers during the 2011 Unionline Survey suggested widespread interest in mobile content. In response, Union Gas is:
  - Implementing a 'Mobile Nominations' initiative for 2012
  - Implementing a 'Mobile Strategy' for uniongas.com

- **Communication** – Feedback provided by customers during the 2009 Proprietary Survey and 2010/2011 Mastio Survey suggested communication as an opportunity for improvement. In response, Union Gas is:
  - Enhancing the S&T website for ease-of-use and better integration with Unionline
  - Releasing a new S&T "landing page"
    - Creating a centralized location for key information and communications.

# Union Gas Communications

- **Key Business Contact Information Updates**
  - Recent communication has gone out requesting confirmation of Force Majeure contact information
- **S&T 360 Email Communication**
  - An initiative undertaken in 2011 meant to provide accurate and timely communication to Union's Customers and other Stakeholders
- **Dawn Horizon**
  - Quarterly electronic publication; watch for March 2012 issue
- **2012 Union Proprietary S&T Survey**
  - Opportunity to provide direct feedback and drive customer-focused initiatives forward – "Help us help you!"

**We value your input and are continually looking for ways to enhance your experience with us!**

# Summary

- Union and Spectra are working towards bringing incremental supply to Dawn and increasing takeaway capacity and reliability from Parkway
- Marcellus and Utica are for real and are here to stay – Union will continue to adapt to the Evolving Natural Gas Market by responding to the needs of our customers and providing best-in-class services through safe and reliable operations
- Union strives to be your "Supplier of Choice" for S&T services – we value your input and are taking actions to improve customer satisfaction by providing the best overall value proposition

**Union Gas – Meeting the Needs of an Evolving Market**

# For Your Business Needs - Contact Us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VP Business Development,
Storage & Transmission
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**Matt Ciupka**
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http://www.uniongas.com/storagetransportation/

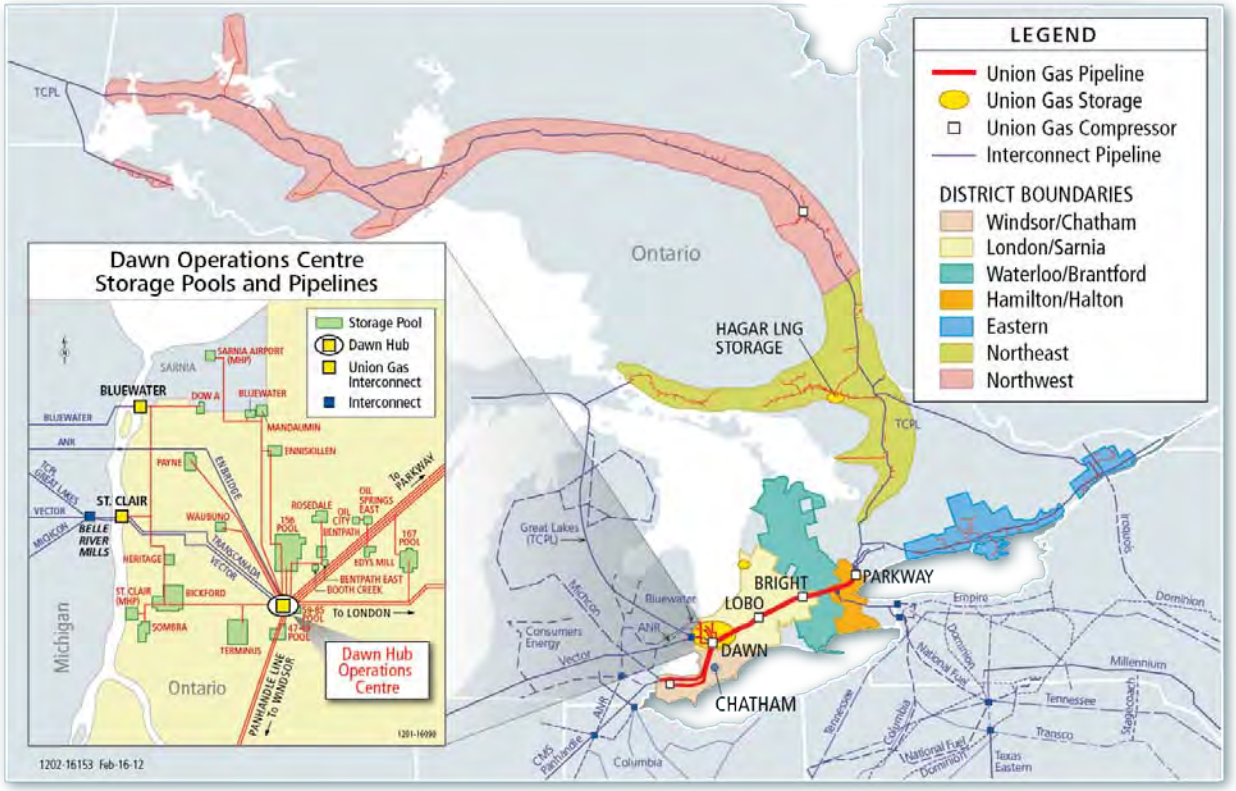
# Union Gas at a Glance

uniongas
A Spectra Energy Company

| Distribution | |
|---|---|
| **Retail Customers**: | 1.4 million |
| **Annual Throughput**: | 526 PJ |
| **Distribution Pipe**: | 62,711 km |

| Transmission | |
|---|---|
| **Annual Throughput**: | 880 PJ |
| **Transmission Pipe**: | 4,743 km |
| **Markets Served**: | Ontario, Quebec, US Northeast |

| Dawn Storage | |
|---|---|
| **Storage**: | 166 PJ |
| **Underground Facilities**: | 23 |
| **Markets Served**: | Ontario, Quebec, Marketers |



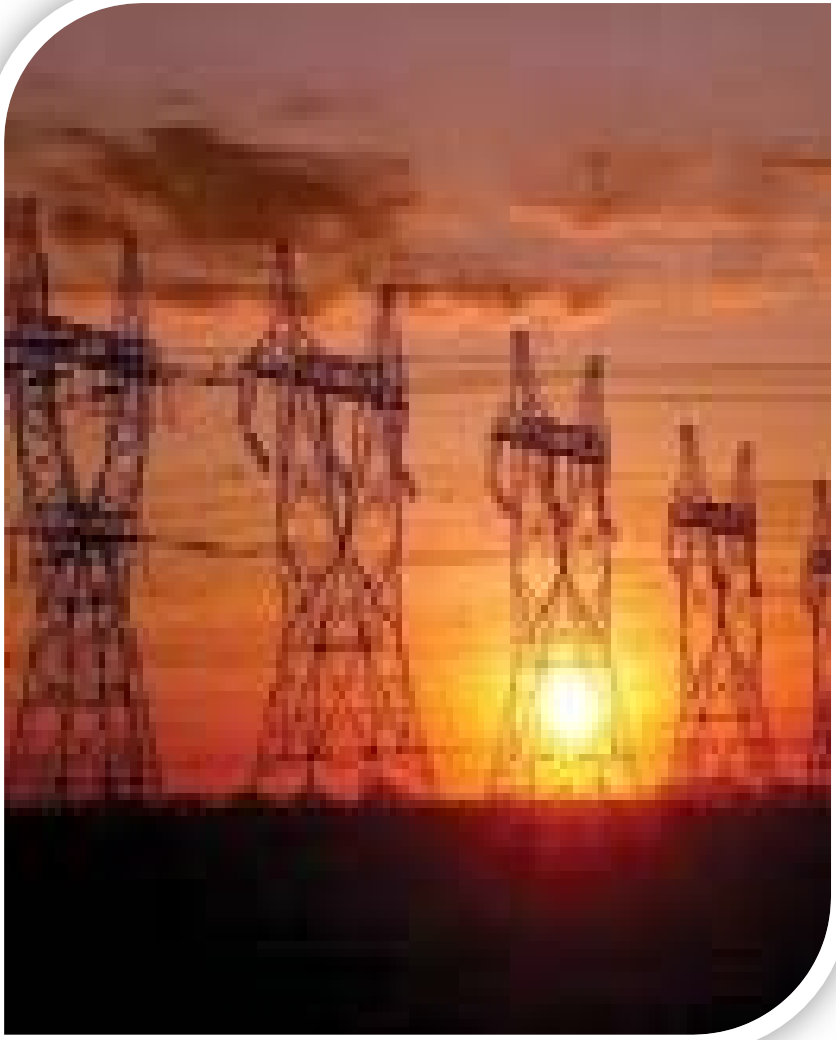

uniongas

A Spectra Energy Company


uniongas

A Spectra Energy Company

# The Sustainable Role of Natural Gas in Ontario Power Markets



Mark Isherwood, VP
Business Development, Storage & Transportation
April 2012

# Adding Perspective to Natural Gas

## 1 GJ of Natural Gas is Approximately Equivalent to:

It Takes 100 GJ to Heat a Canadian Single detached Home for 1 year Natural Resources Canada

A 30 Litre Tank of gasoline = 1 GJ of Energy

National Energy Board of Canada

1 million GJ = 1 PJ: Canada consumes 1 PJ every 50 mins National Energy Board of Canada

# Union Gas at a Glance

uniongas
A Spectra Energy Company

| Distribution | |
|---|---|
| **Retail Customers**: | 1.4 million |
| **Annual Throughput**: | 526 PJ |
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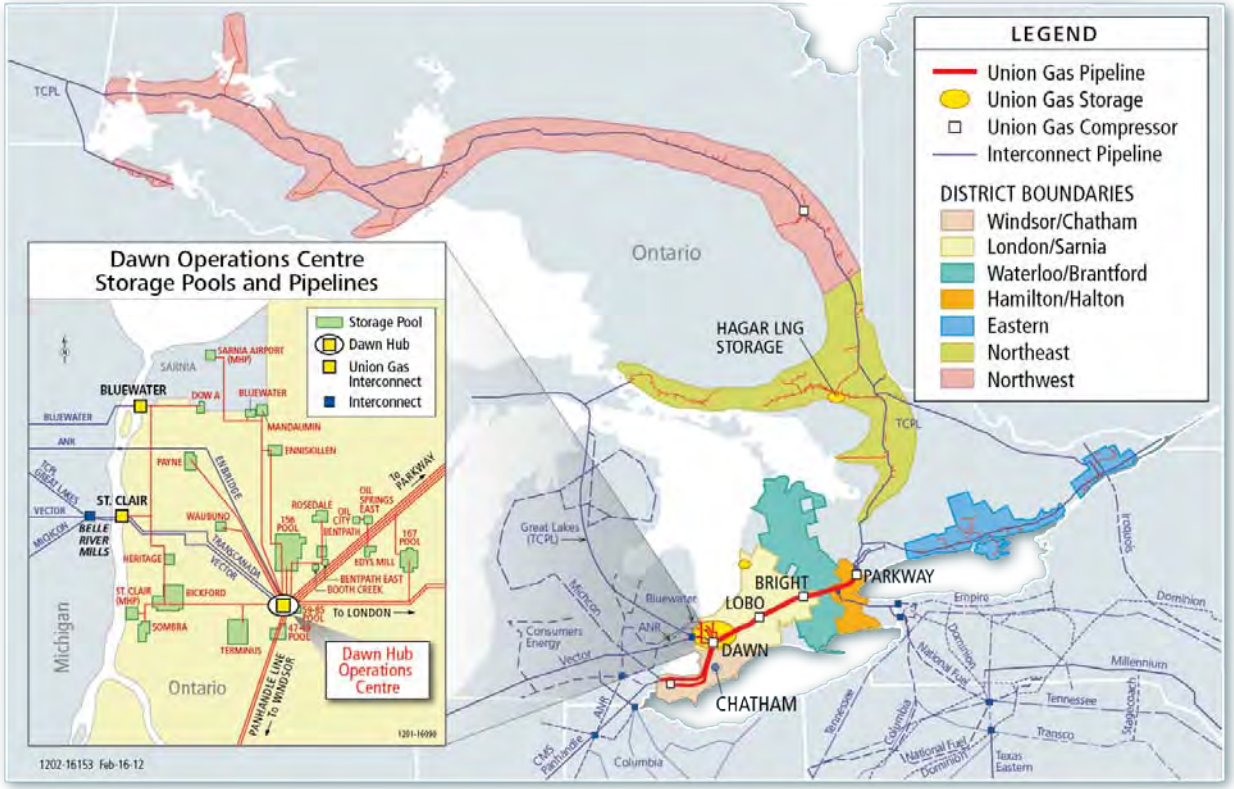

# Safe Harbour Statement

Some of the statements in this document concerning future company performance will be forward-looking within the meanings of the securities laws. Actual results may materially differ from those discussed in these forward-looking statements, and you should refer to the additional information contained in Spectra Energy's Form 10-K and other filings made with the SEC concerning factors that could cause those results to be different than contemplated in today's discussion.

## Reg G Disclosure

In addition, today's discussion includes certain non-GAAP financial measures as defined under SEC Regulation G. A reconciliation of those measures to the most directly comparable GAAP measures is available on our website.

# Agenda

- Is Ontario on track to meet provincial targets?
- North American Natural Gas Fundamentals dampening price of electricity for the long term
  - Power Generation Demand
  - North American Supply Forecast
  - North American Price Forecast
- Union Gas - Meeting the Needs of an Evolving Marketplace
  - Energy Industry Partnering across Ontario
  - New approaches to serving power generation demands
  - Capital Investment – new infrastructure

# Ontario Coal Retirement

## Coal retirement and natural gas installations 2007-2012

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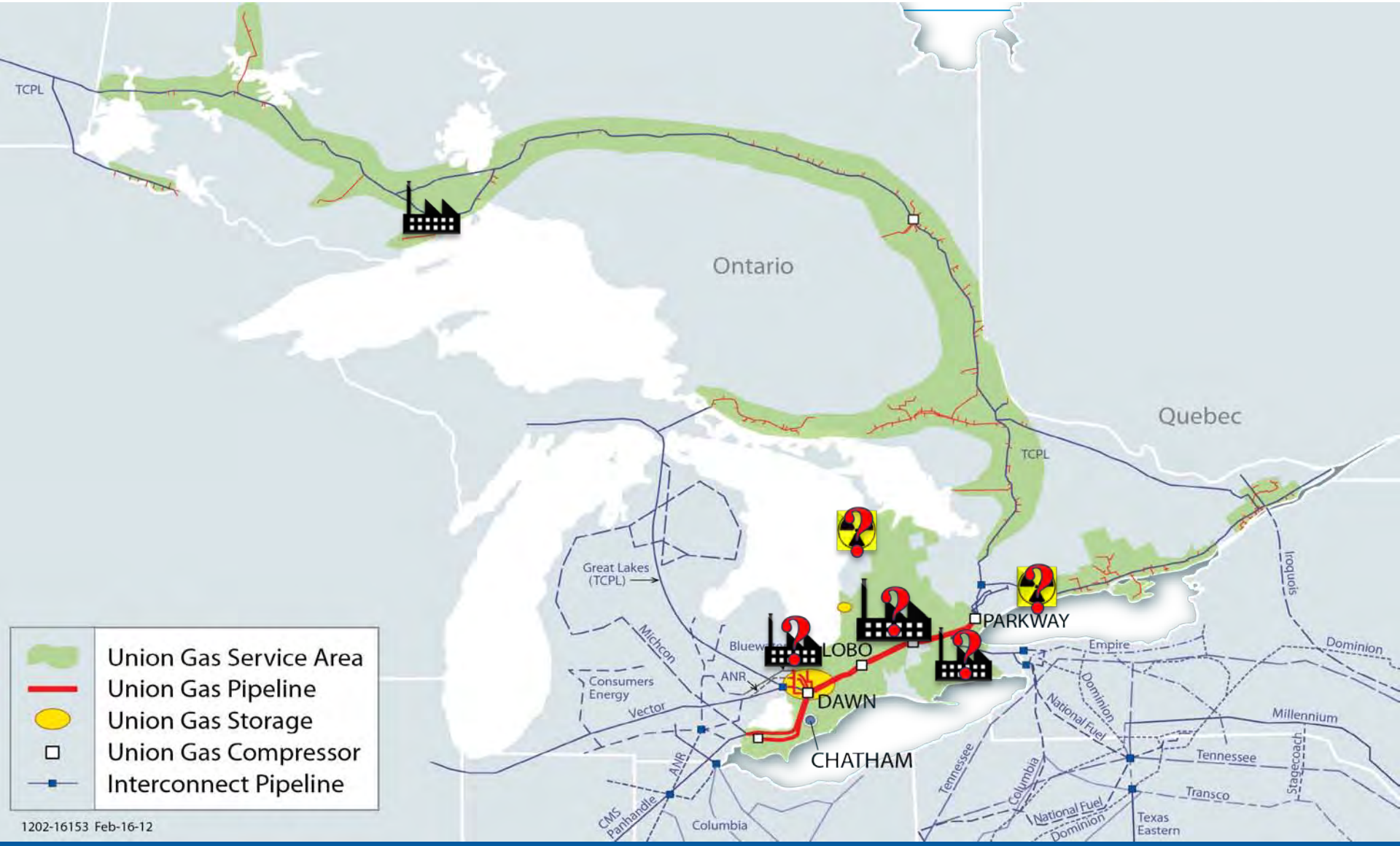

# Ontario Coal Retirement

## Coal retirement and natural gas installations 2007-2012

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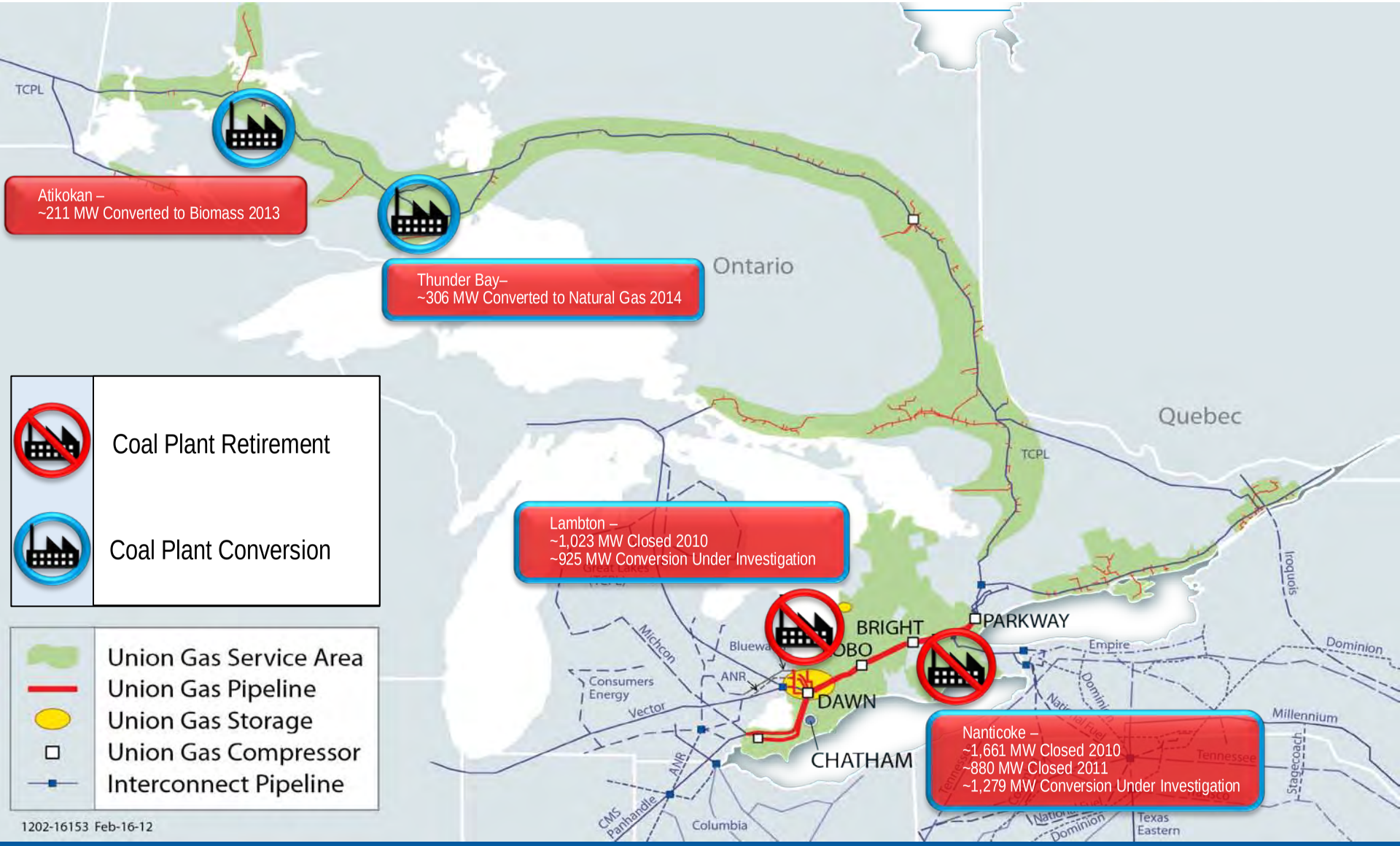



1202-16153 Feb-16-12

- Energy for Life: Natural Gas Produces Jobs in North America – YouTube

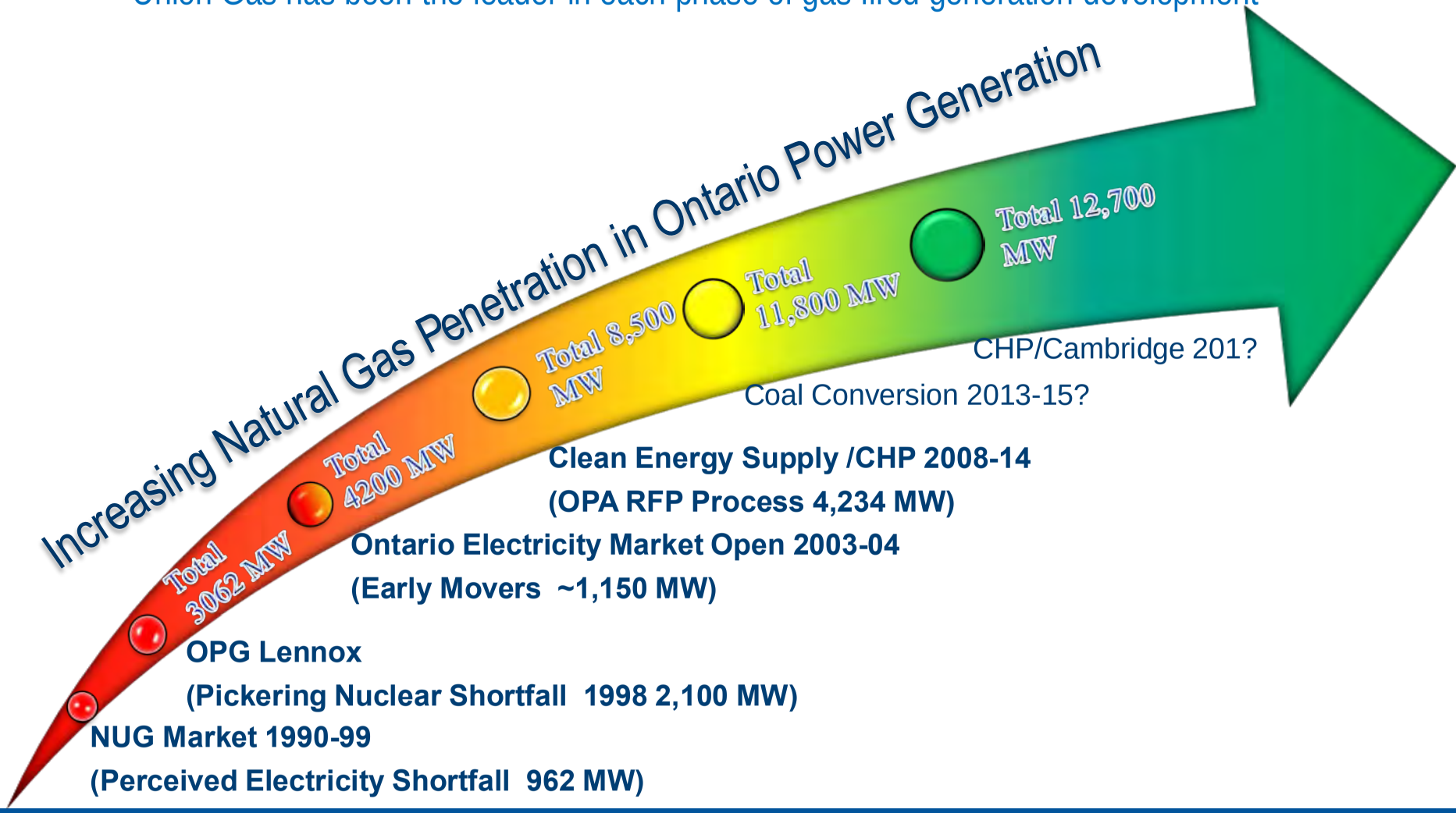
# Driving demand growth for Ontario

## Power Generation

# Historical Perspective

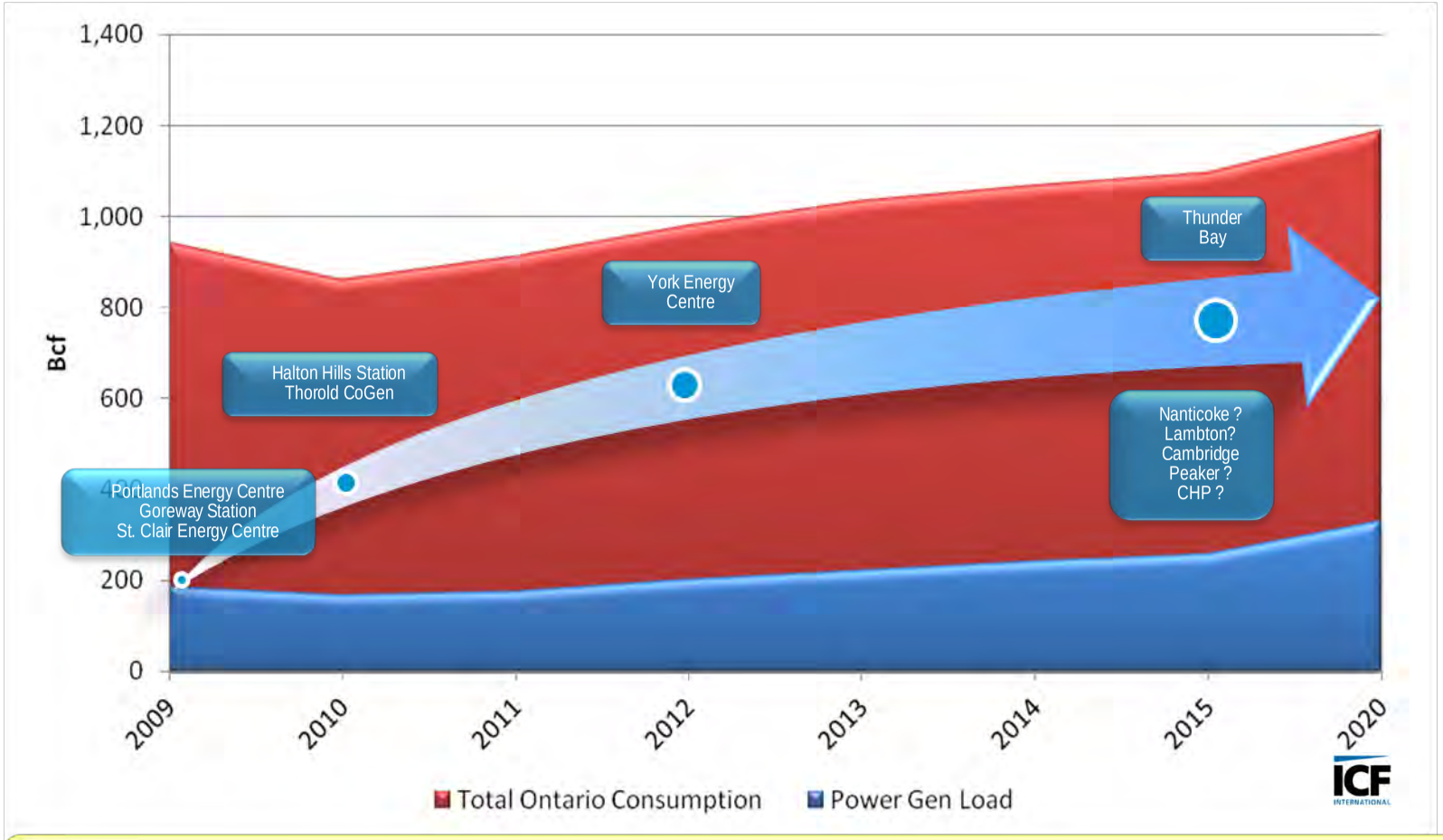
## Major Gas Fired Power Generation in Ontario

Union Gas has been the leader in each phase of gas fired generation development



# Power Generation Gas Demand

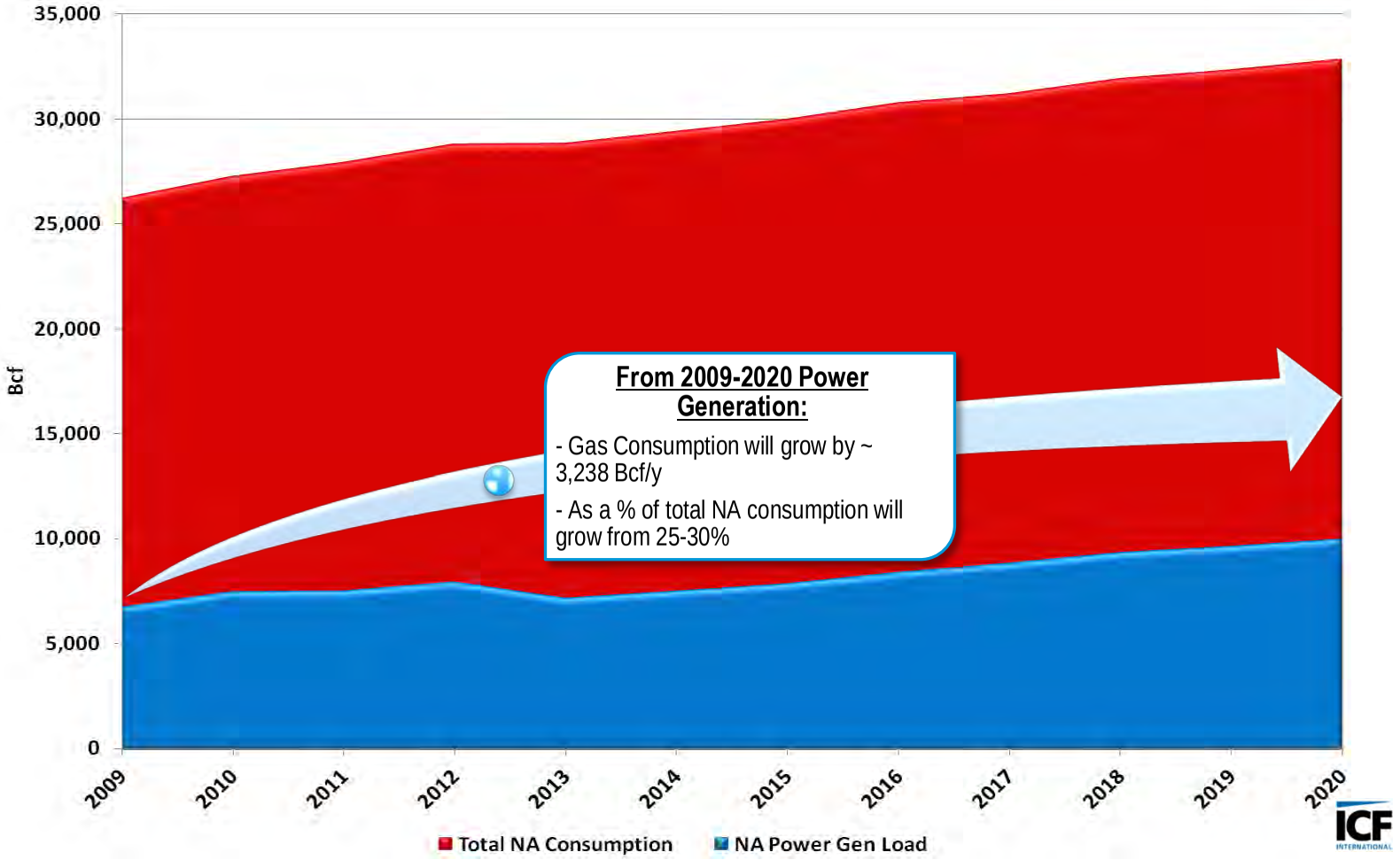
## Already Significant & Growing % of Ontario's Load Factor




Power generation will grow nearly 50% over 2009 levels by 2020 to represent almost 30% of the load factor of natural gas into Ontario by 2020.

# Power Generation Gas Demand

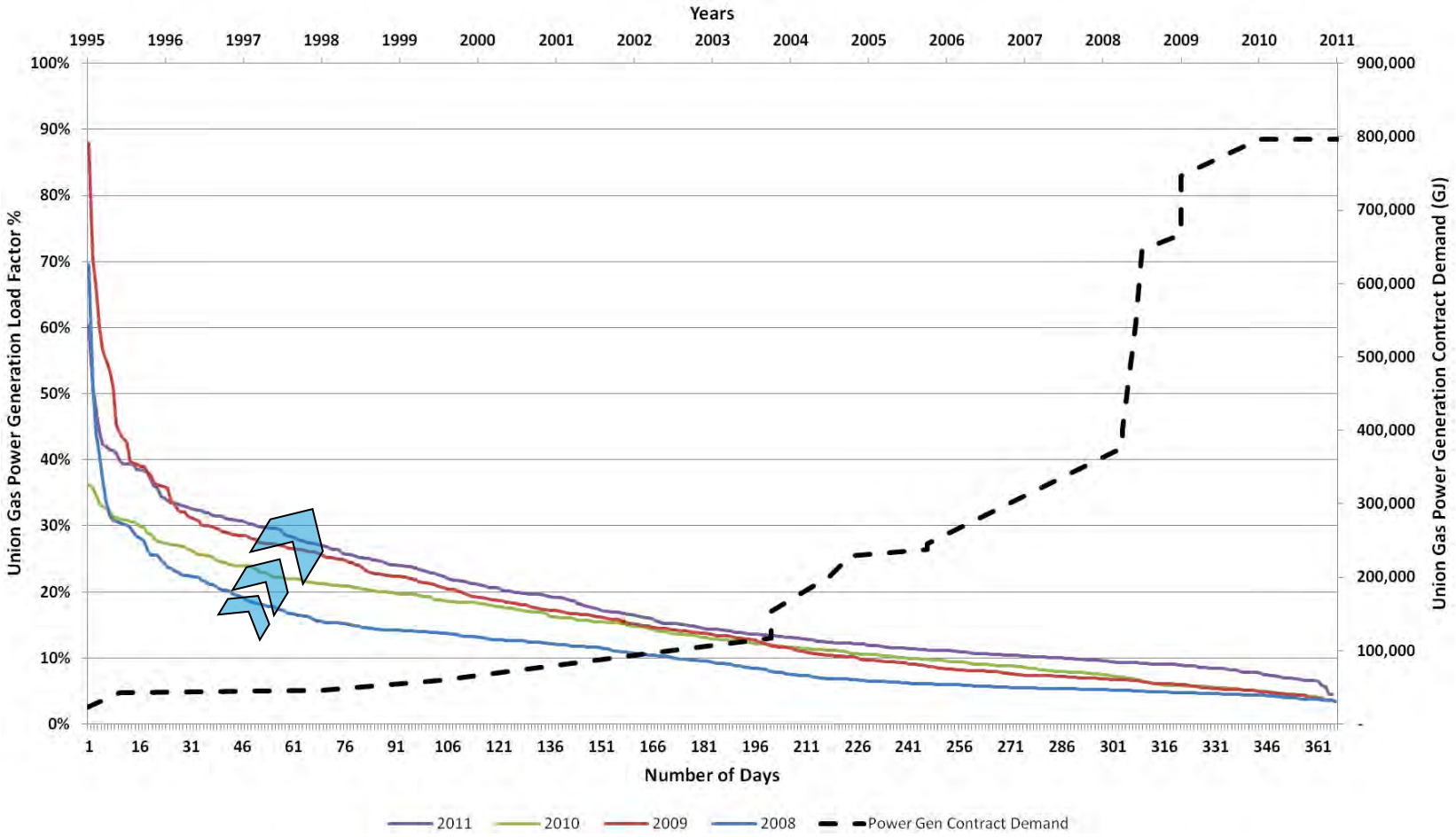
## Also a Growing % of North America's Consumption




Power generation growth is a North American story, not limited to Ontario.

# Power Generation Gas Demand (Avg. Annual %)

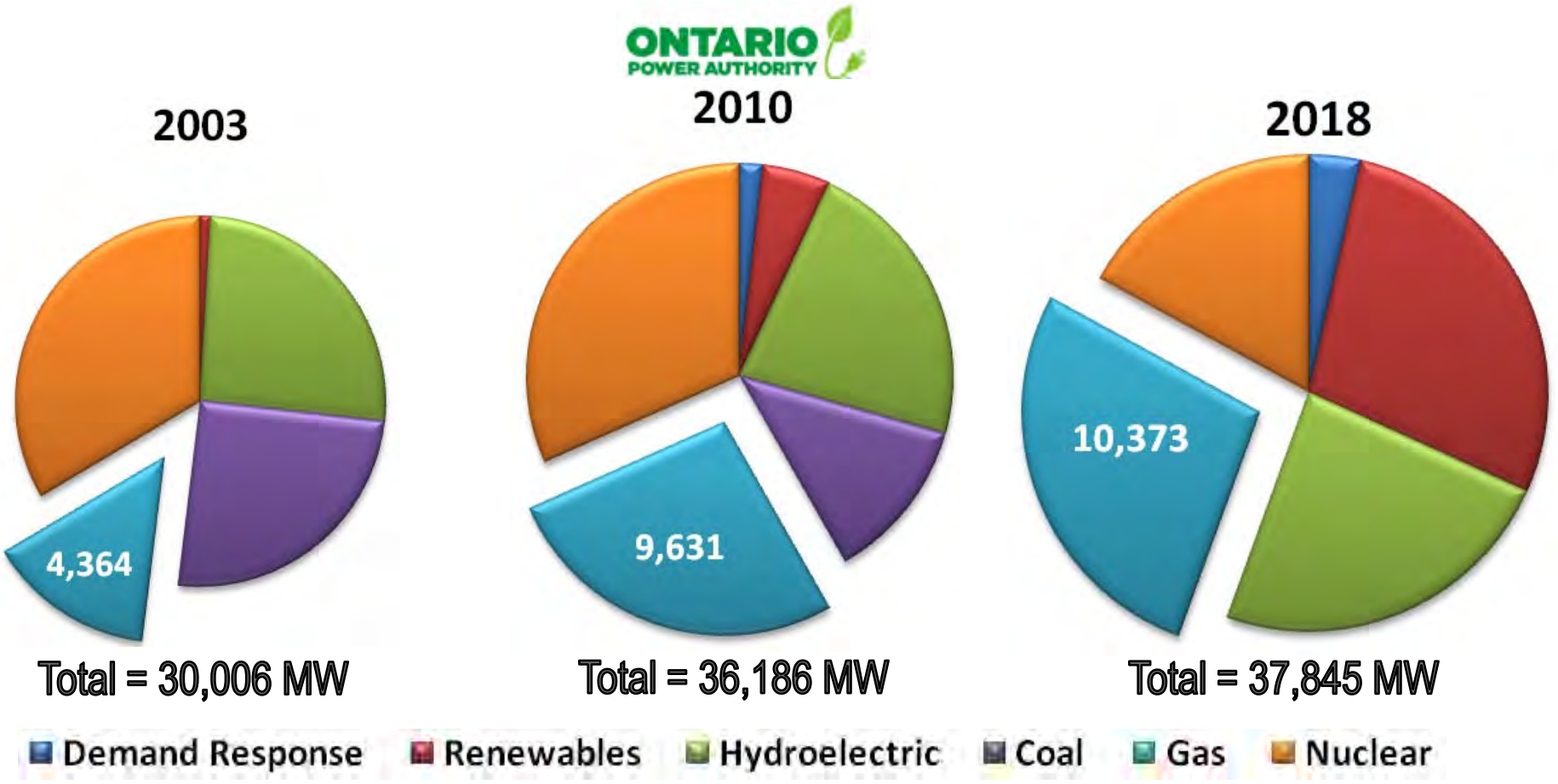
## Already Significant & Growing % of Union's Load Factor




Since 2008 power generation has grown as a % of Union Gas' load factor. This trend is expected to continue as gas powered generation continues to expand in Ontario.

# Ontario Power Generation Mix (MW)

## Natural Gas Power Generation Demand




Natural gas will continue to represent a growing segment of Ontario's electricity supply mix.

# Reserve Estimates 2008 vs. 2012

## From LNG Imports & Alaska to Unconventional Gas Supply

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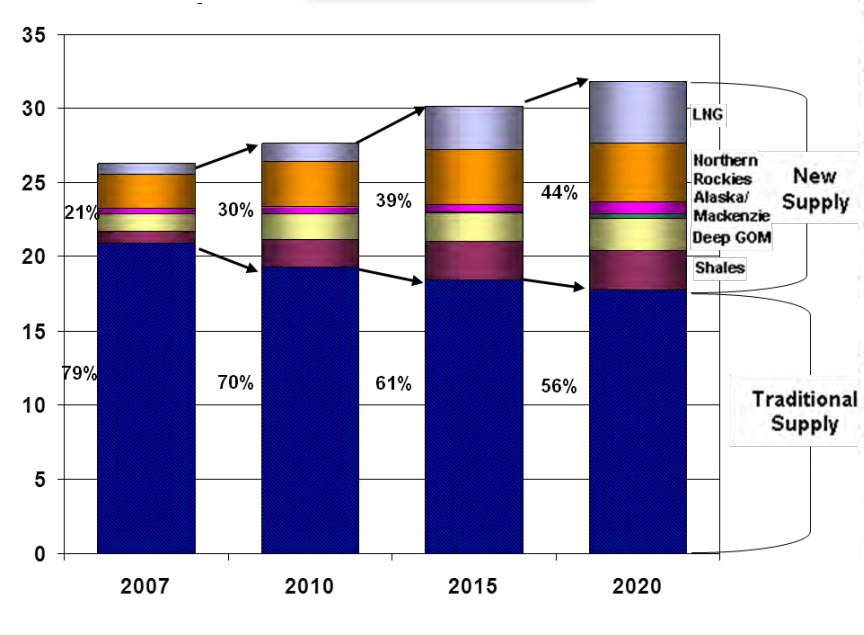
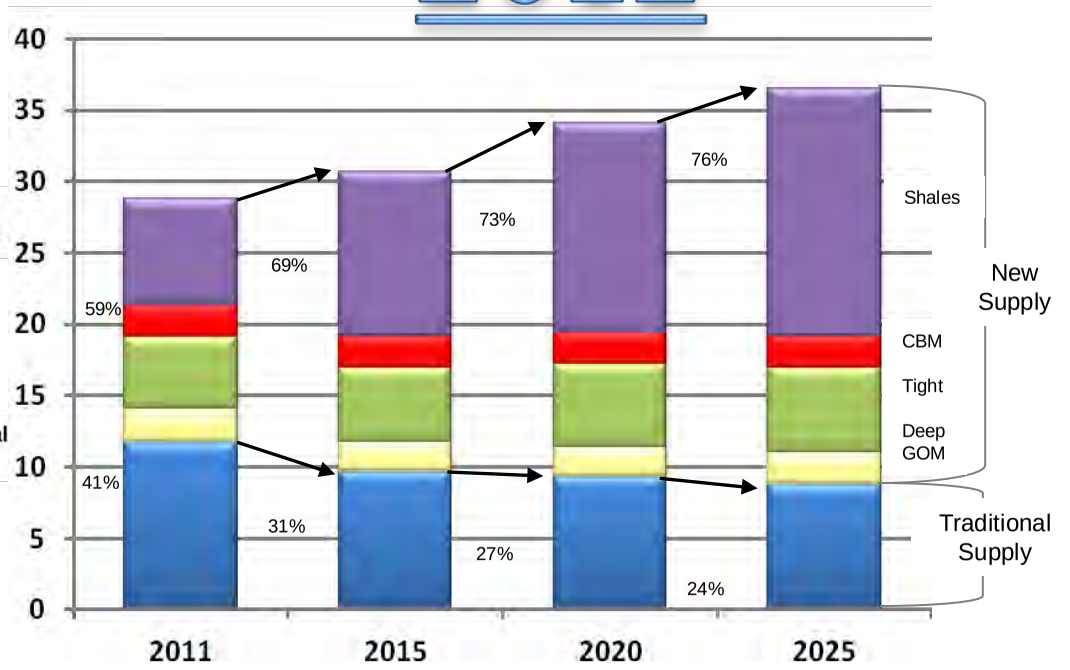
## 2008



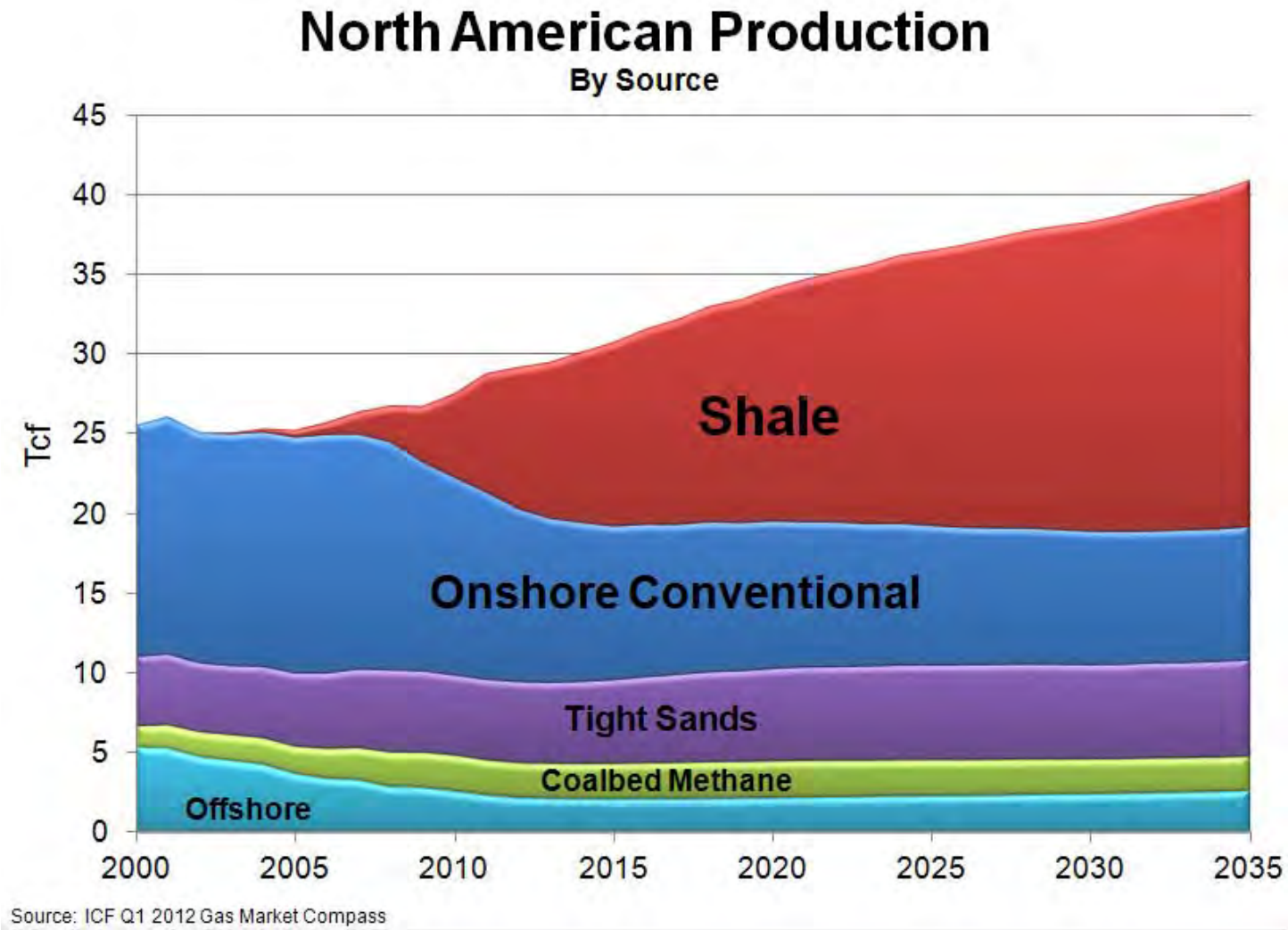

## 2012




Since 2008 the North American supply picture has changed significantly. Growth in LNG Imports has been replaced by prolific growth in unconventional supply.

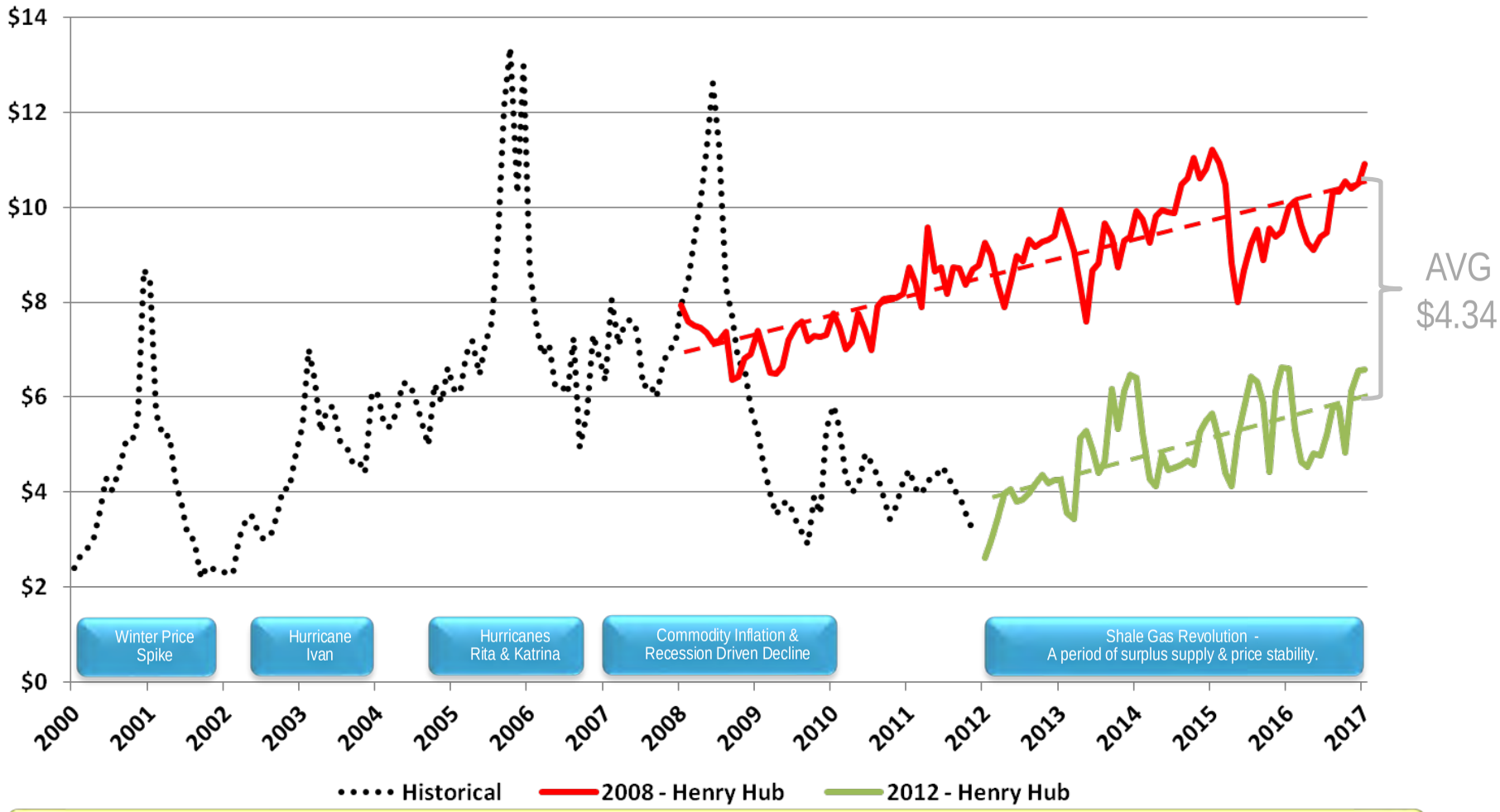
# Natural Gas Production Breakdown

## 150 Years of Natural Gas Supply at Current Consumption



# Henry Hub Price Forecasts

## 2008 vs. 2012 ICF Gas Prices – lower prices greater stability




Since 2008 gas prices have dropped $2 - 5 & experienced lower volatility.

# A Diversity of Gas Supply

## Strong IRRs at Current Price Levels

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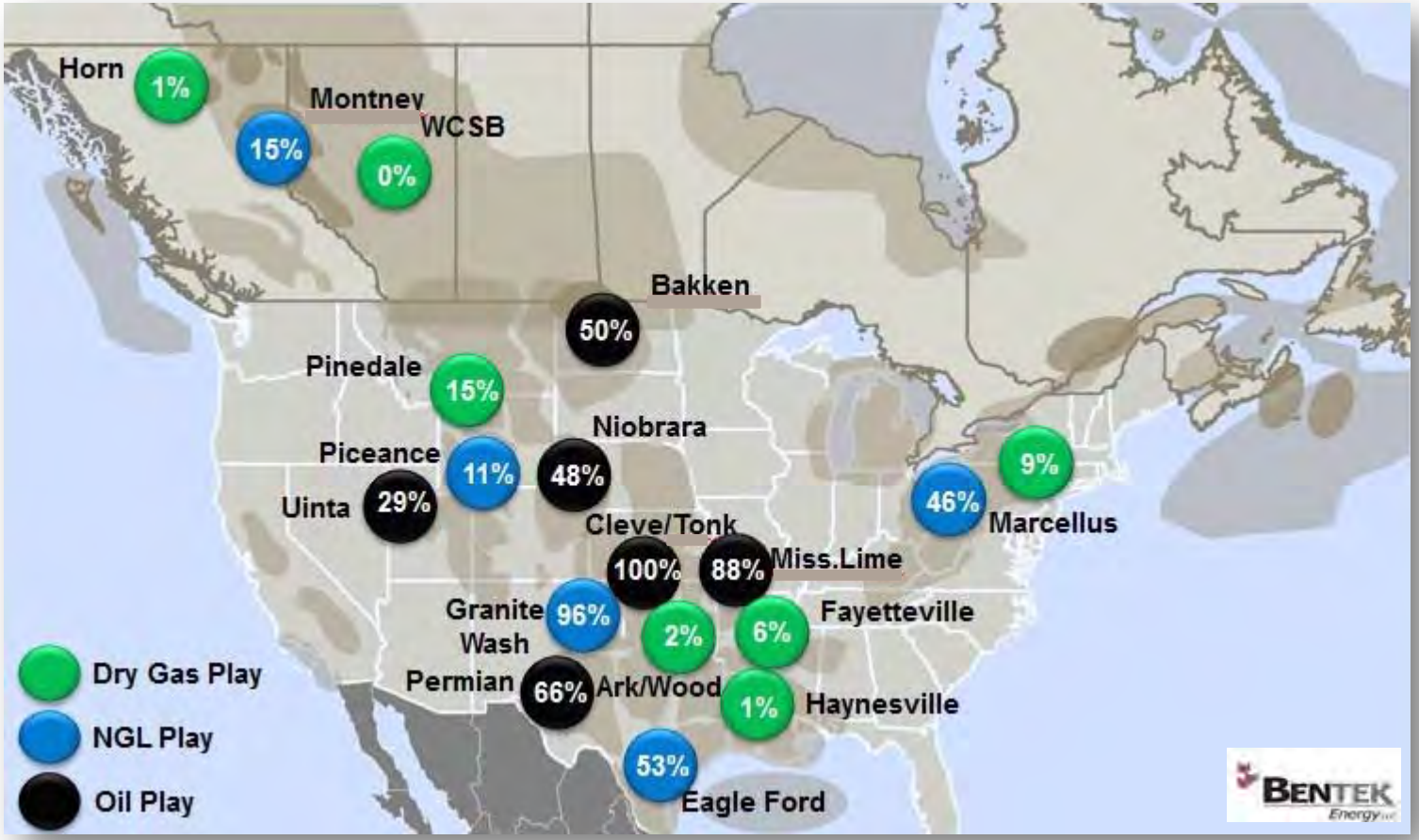


Despite low gas prices drilling will continue, especially in oil associated & liquids rich natural gas plays across North America.

# The Impact of Shale Gas

## Benefits Ontario Gas Consumers

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- Abundant quantities of shale gas have reduced the price of natural gas creating an average annual Ontario consumer savings up to $500/year since 2009.

- With approximately 1 Tcf of natural gas demand in Ontario, lower natural gas prices mean energy savings of at least $3 - $4 billion annually.

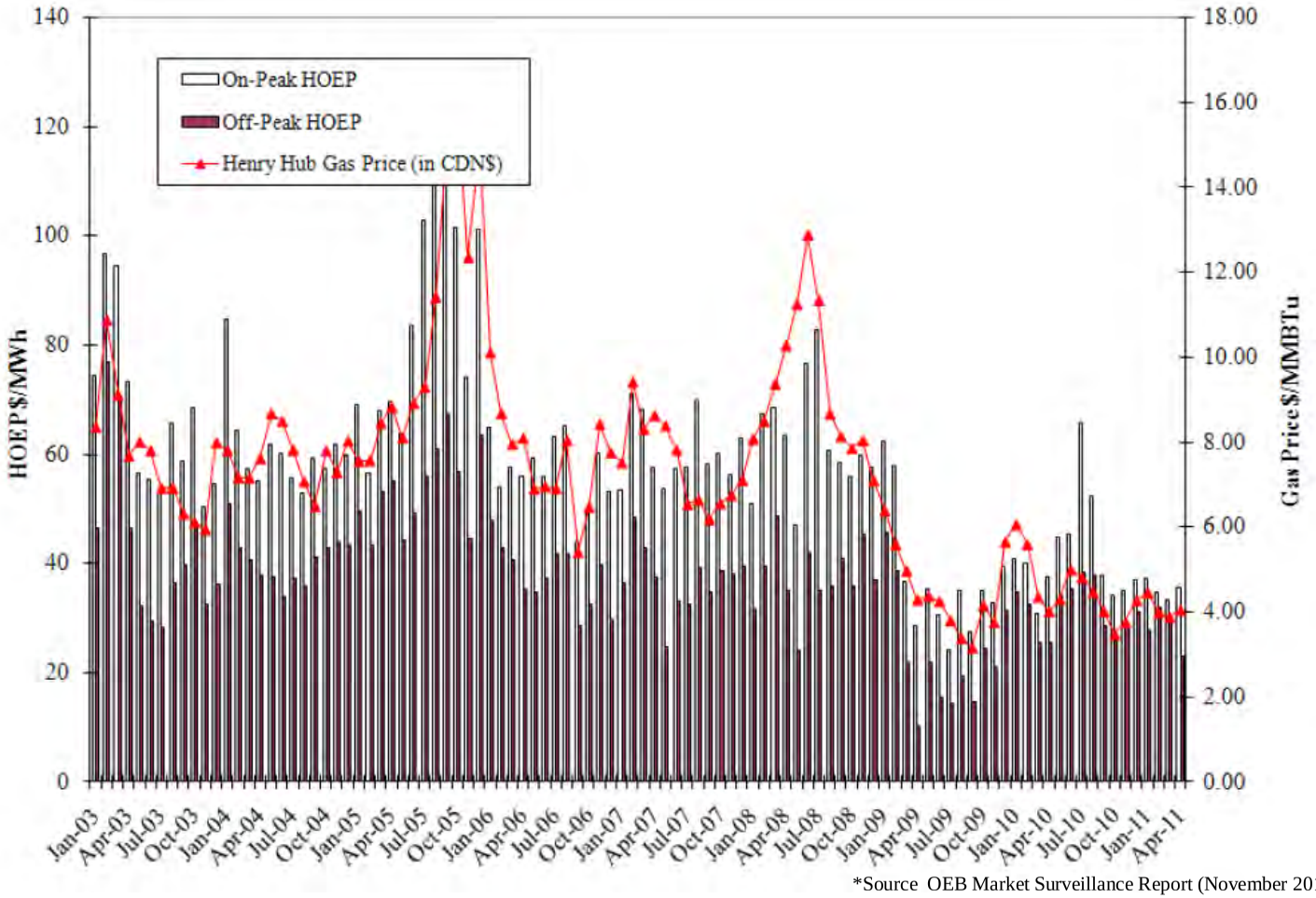
**Estimated annual savings per Union Gas customer/type**

| Customer Type | Annual Savings |
|---|---|
| Average Residential Consumer | **$270 - $350** |
| Average Commercial Consumer | **$9,000 - $15,000** |
| Average Large Industrial Consumer | **$11M - $17M** |

Shale gas saves Ontario consumers, business and industry in the order of $3 - $4 billion annually, providing significant benefits to employment and the economy.

# The Impact of Shale Gas

## Benefits Power Generators & Ontario Residents

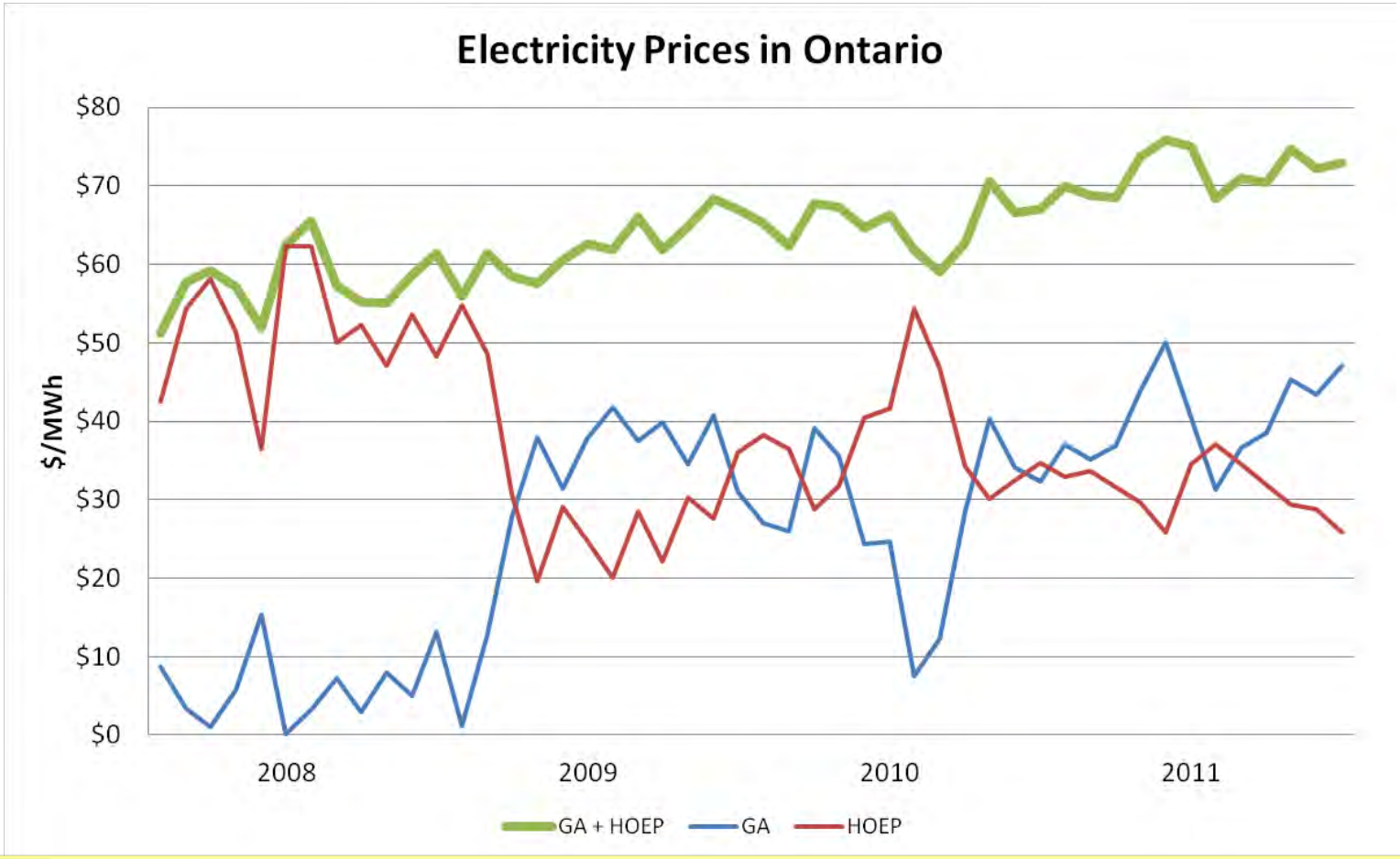



*Source OEB Market Surveillance Report (November 2011)

There is a strong correlation between HOEP prices & gas commodity prices.

# The Impact of Shale Gas

## Benefits Power Generators & Ontario Residents




Natural Gas Power Generation will be a cost effective means of providing Ontario with electricity long into the future.

# Power Generation

## Meeting the needs of an evolving market

- Energy industry partnership across Ontario
- New approaches to serving power generation demands
- Capital Investment – new infrastructure

# Meeting the Needs of Ontario

Energy industry partnerships

## Integration of Ontario Natural Gas LDCs and IESO

- Established communication procedures between UGL & EGD and IESO.
- Facilitate information exchange for resolution of operational issues, such as:
  - high demand,
  - transmission constraints and
  - low resource availability
- The objectives:
  - Maintain reliability of IESO grid and gas transmission systems
  - Prevent, contain & minimize the impact of emergencies or events on either side of IESO or gas
  - To return either/both systems to normal following an emergency or event

Bi-directional Communication of operational issues. Support of day-ahead/real time operations. Cooperative management of adverse system or weather conditions.

# Meeting the Needs of Ontario

New service approaches

## Serving Clean Energy Supply Contracts

Industry partners (Union Gas, Enbridge, TCPL and IESO)developed firm, integrated services to meet the needs of power generators

- Enabling power generators to come up within 15 minutes of dispatch
- Overcoming the challenges of the “electric day” (midnight to midnight) versus the “gas day” (9:00 CST to 9:00 CST)
- Balancing generators gas delivery versus gas consumption within the day and within the hour

## Serving Peakers, Coal Conversion & Recontracting NUGS

Union working with generators to provide new opportunities to serve both West and East of Dawn facilities with Dawn sourced supply from diversified mature and evolving sources of natural gas supply

# Meeting the Needs of Ontario

Timely capital investment

- **2005 – 2010**
  - Expansion of Dawn-Parkway transmission system
  - Expansion of Dawn storage & deliverability capabilities
  - New distribution lateral attached to serve power loads within Union Gas franchise

**Future Projects**

- Kirkwall Flow Reversal
- Parkway West
- Parkway Extension Project
- Northern Expansion Transmission (NEXT)

# Kirkwall Flow Reversal

Changing the direction of traditional gas flows in Ontario

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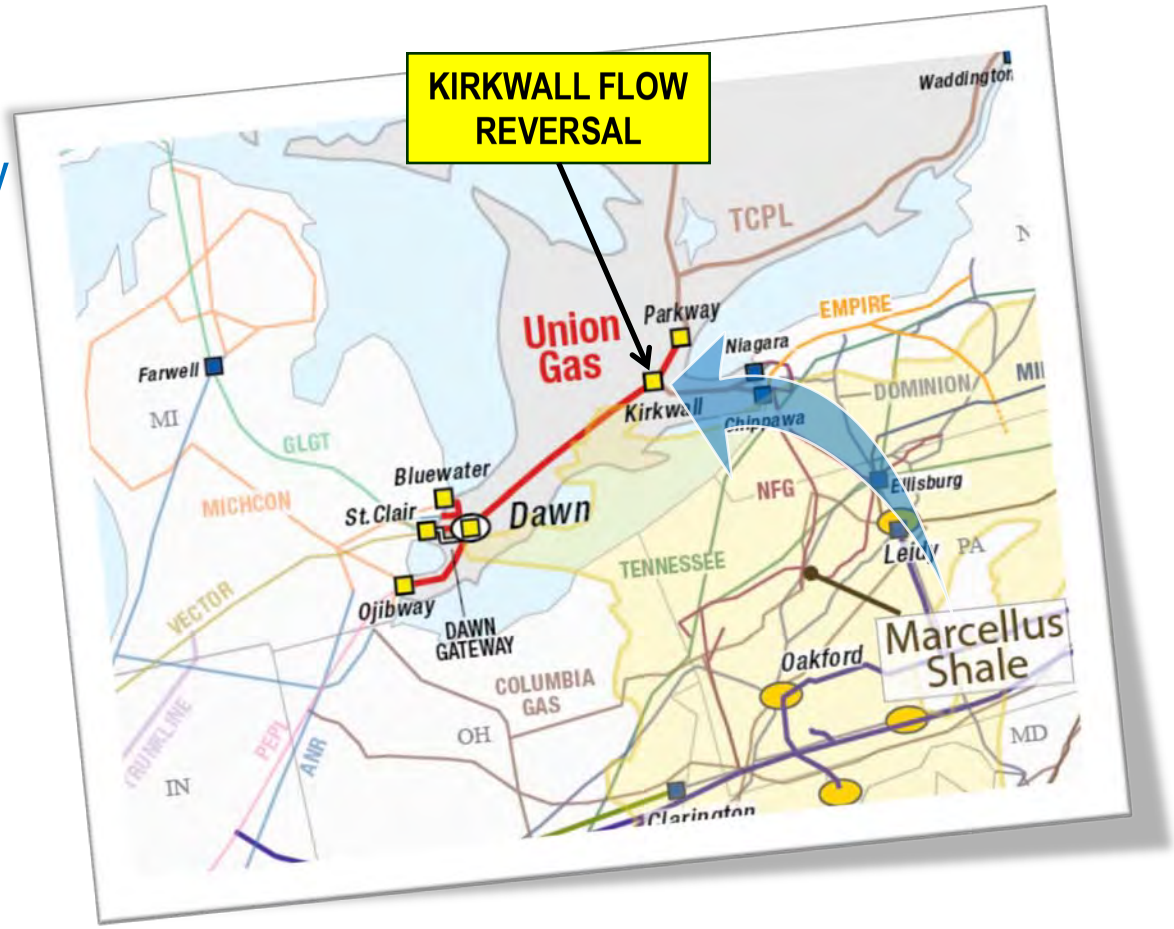
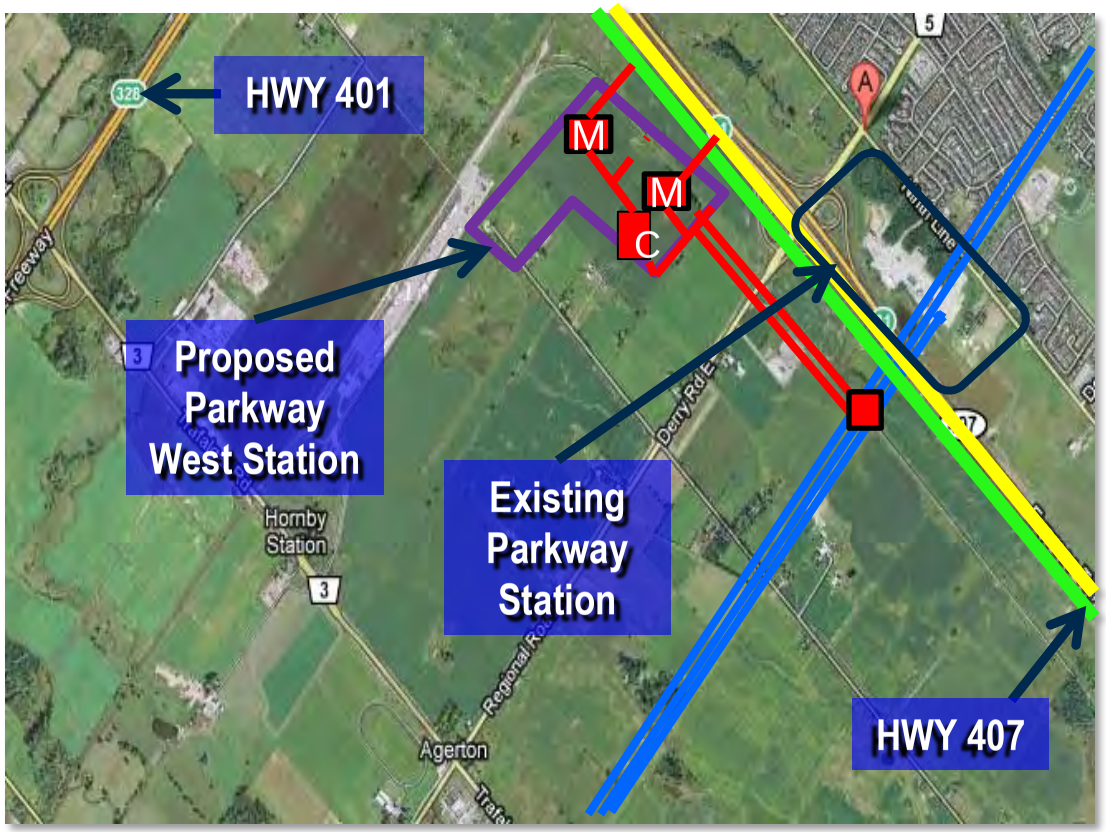
- Allows for bidirectional flow which enables US gas supply to access markets in Ontario & Quebec.
- $4.7 million estimated capital cost
- November 1, 2012 in-service



# Parkway West

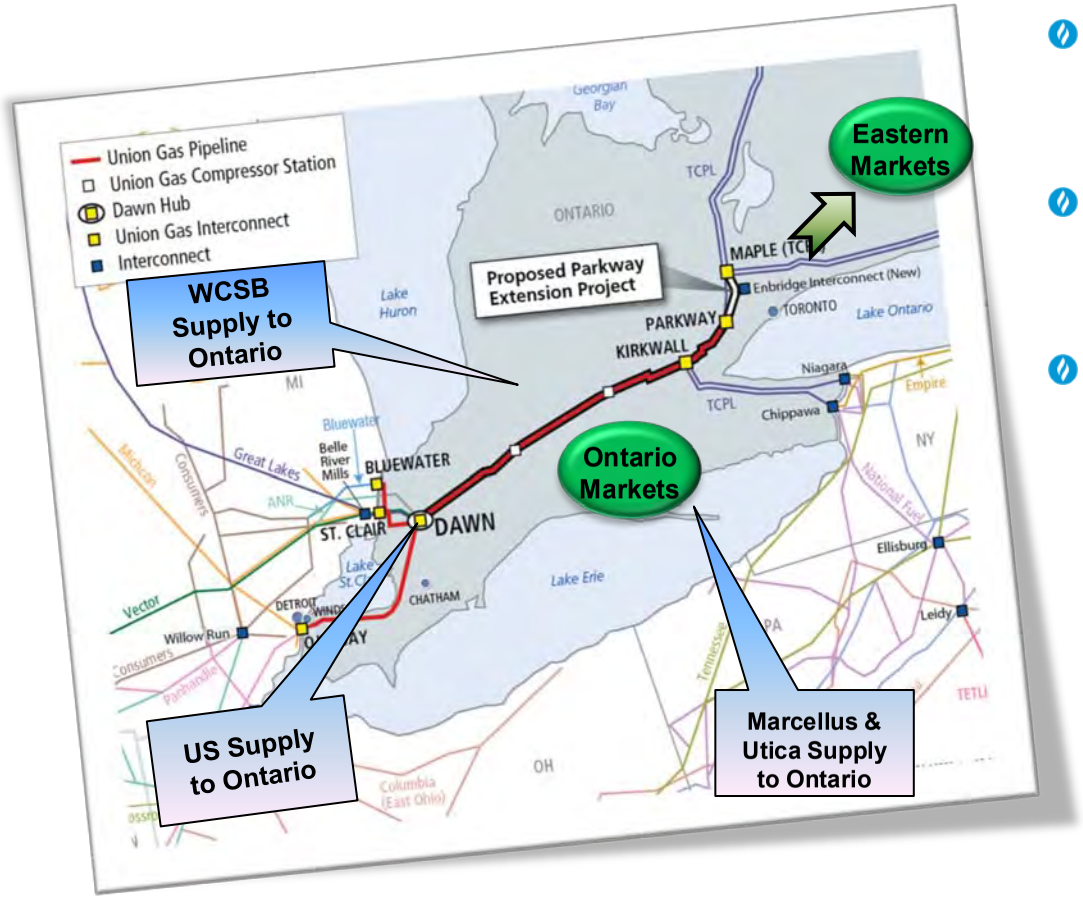
## Enhancing the reliability of deliveries east of Parkway




- Addresses reliability by providing security of supply for markets east & north of Toronto.
- $220 million estimated capital cost
- November 1, 2014 in-service

# The Parkway Extension Project

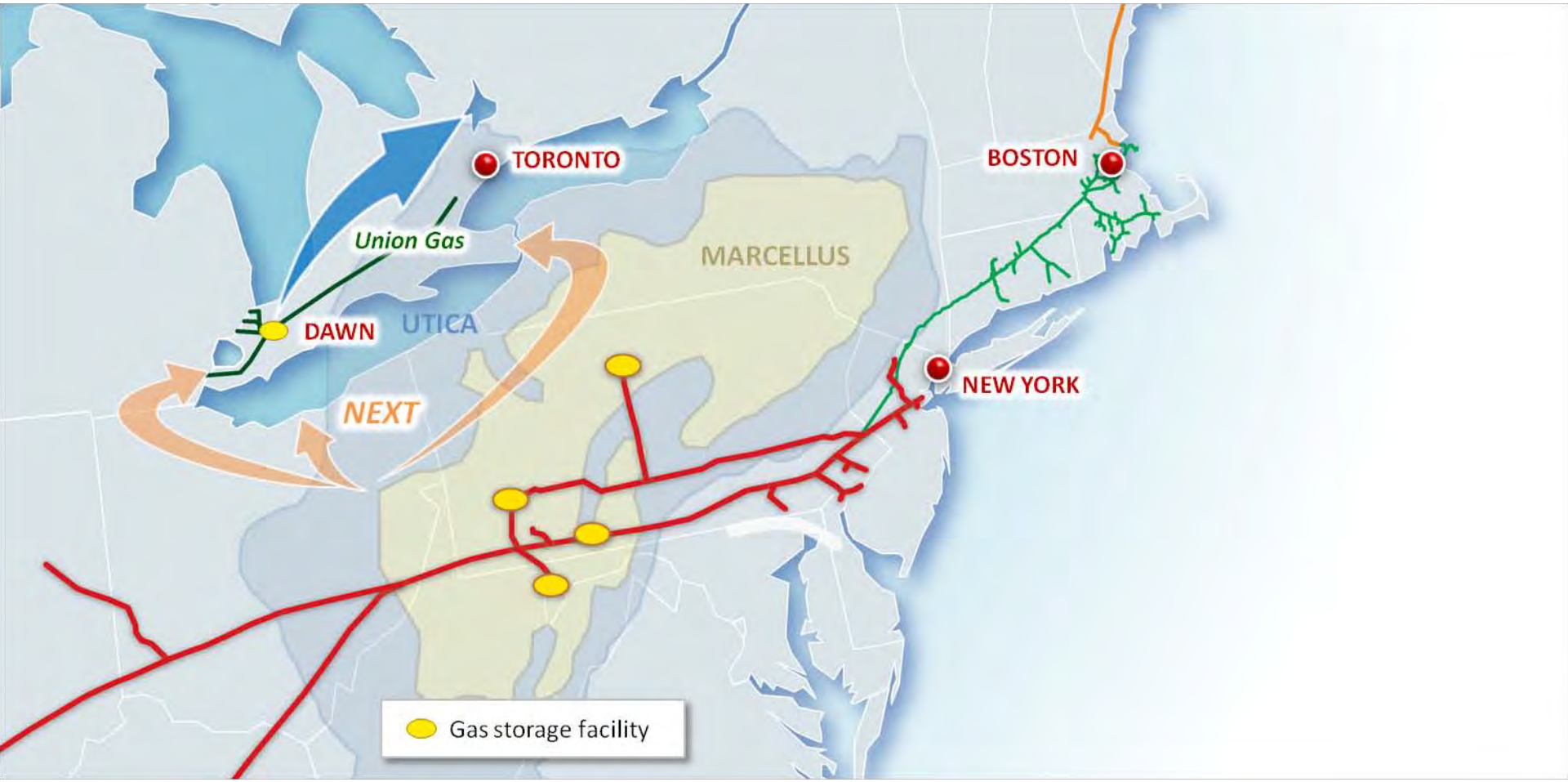
## Providing access to reliable, diverse & competitive supplies




- Serves growing demand for natural gas in Ontario, Quebec & the US Northeast.
- Supports economic development powered by cleaner energy.
- Enhances reliability & security of supply to markets east and North of Toronto & supports “reinforcement efforts” in and around the GTA.

# Northern Expansion Transmission

## Connecting Marcellus & Utica Supply to Our Diverse Markets



# Questions?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# Union Gas Ltd. at TransCanada

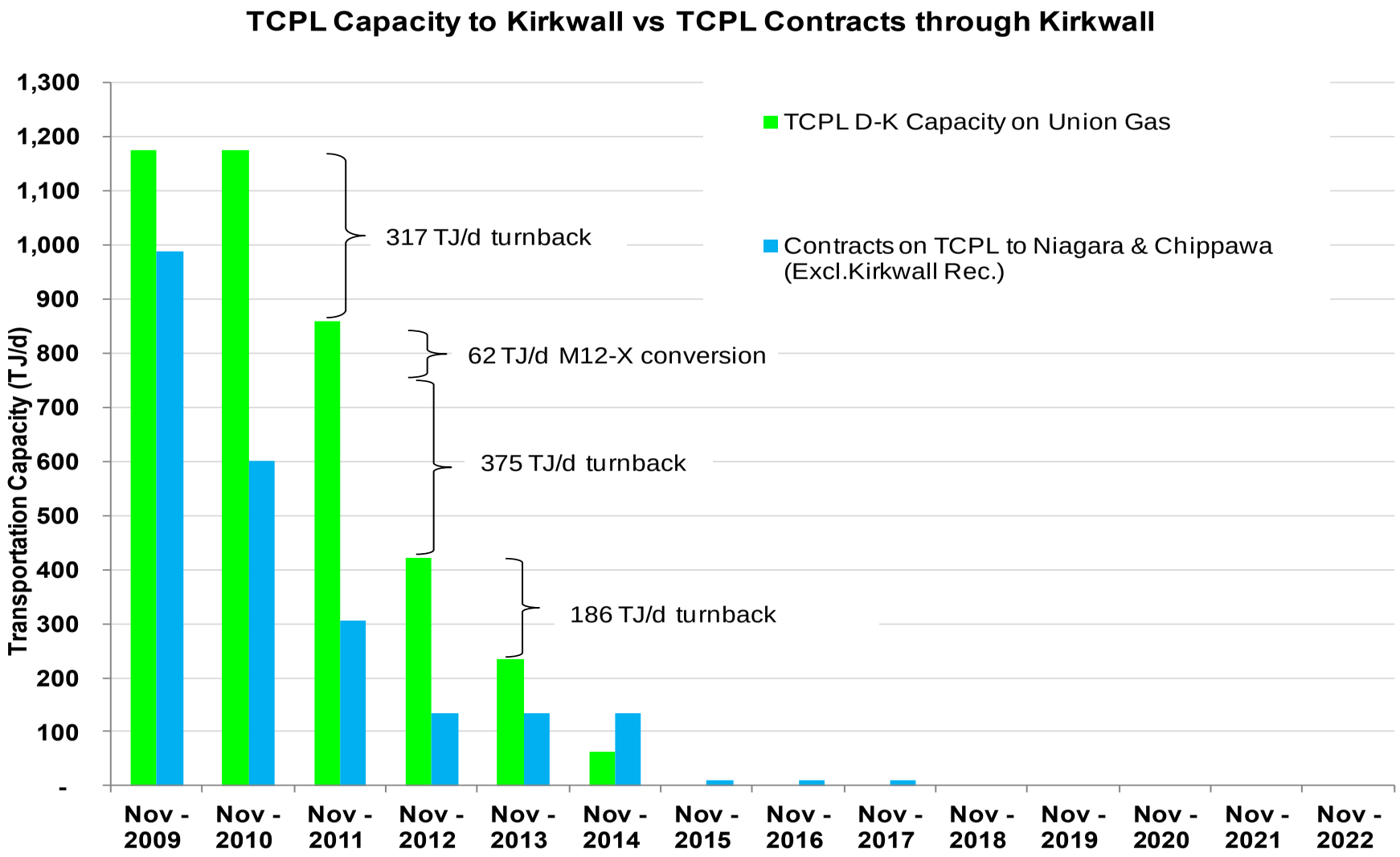
October 28, 2011

Filed: 2012-05-04
EB-2011-0210
J.B-1-7-8
Attachment 6

# Agenda

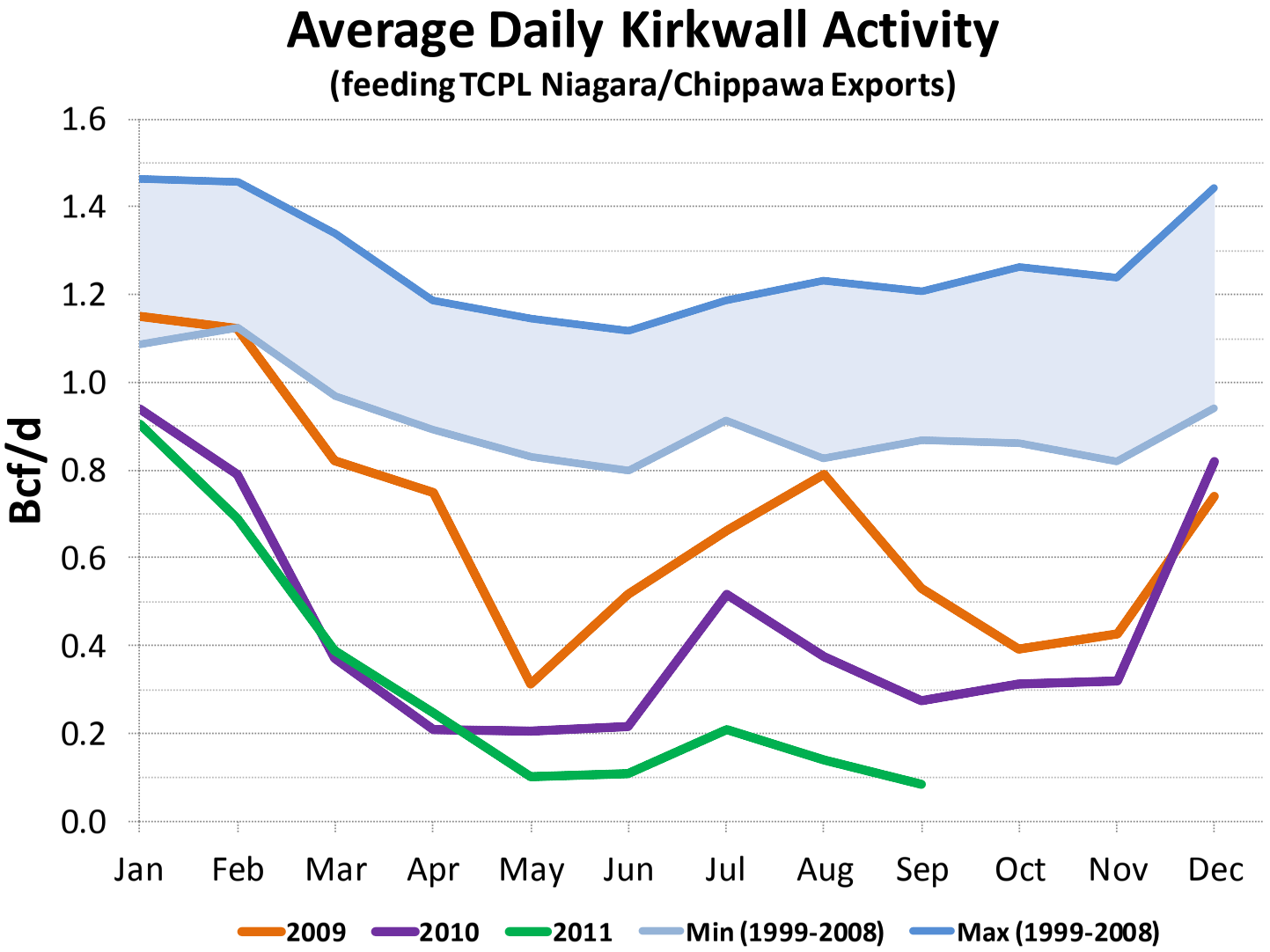
- Kirkwall exports in decline
- The need to debottleneck Parkway
- The Parkway West proposal
- Strategic considerations
- Next Steps

# Kirkwall Exports in Decline



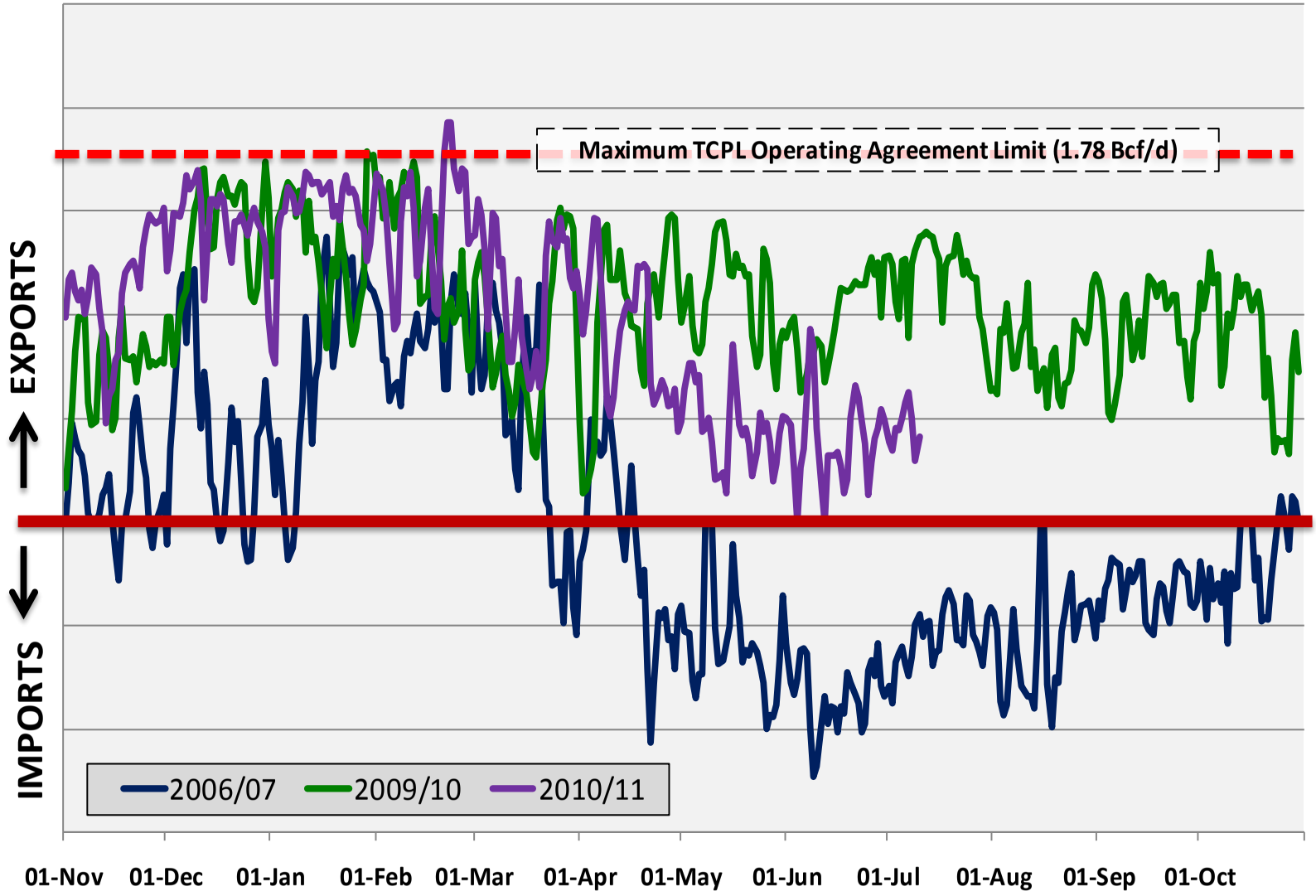
# Kirkwall Exports in Decline





# Net Physical Activity at Parkway

(Includes activity with TCPL and Enbridge)



# Dawn-Parkway System
# Changing Operations and Throughput

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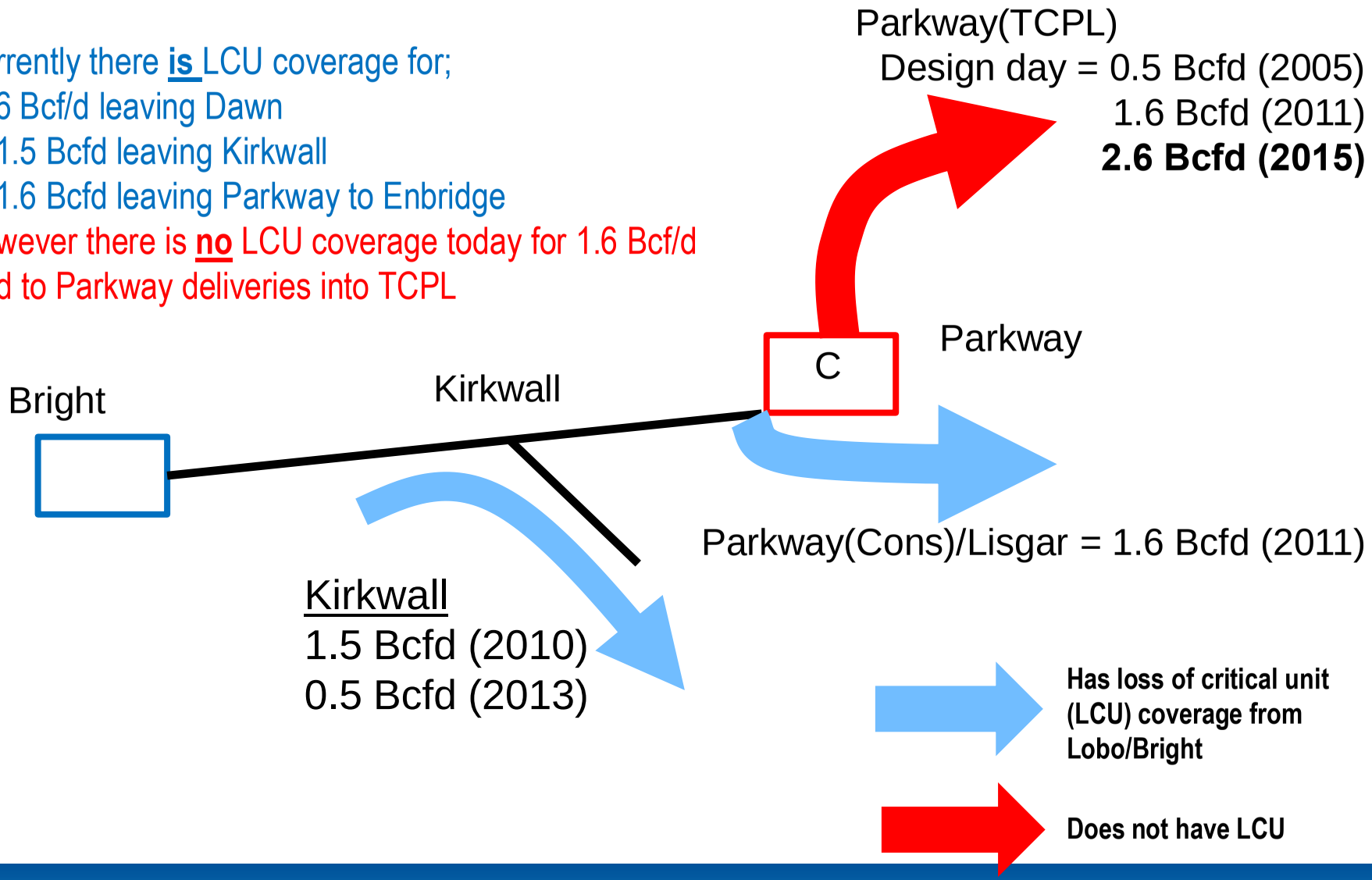
CELEBRATING 100 YEARS Est. 1911

Currently there **is** LCU coverage for;
- 6 Bcf/d leaving Dawn
- 1.5 Bcfd leaving Kirkwall
- 1.6 Bcfd leaving Parkway to Enbridge

However there is **no** LCU coverage today for 1.6 Bcf/d sold to Parkway deliveries into TCPL



# Union is safe and reliable



- Loss of Critical unit coverage for compression at Dawn, Bright & Lobo
- Average compressor reliability above 99%
- Union sells firm capacity assuming critical compression lost
- Transmission pipeline integrity management program underway
- Safe operations of system

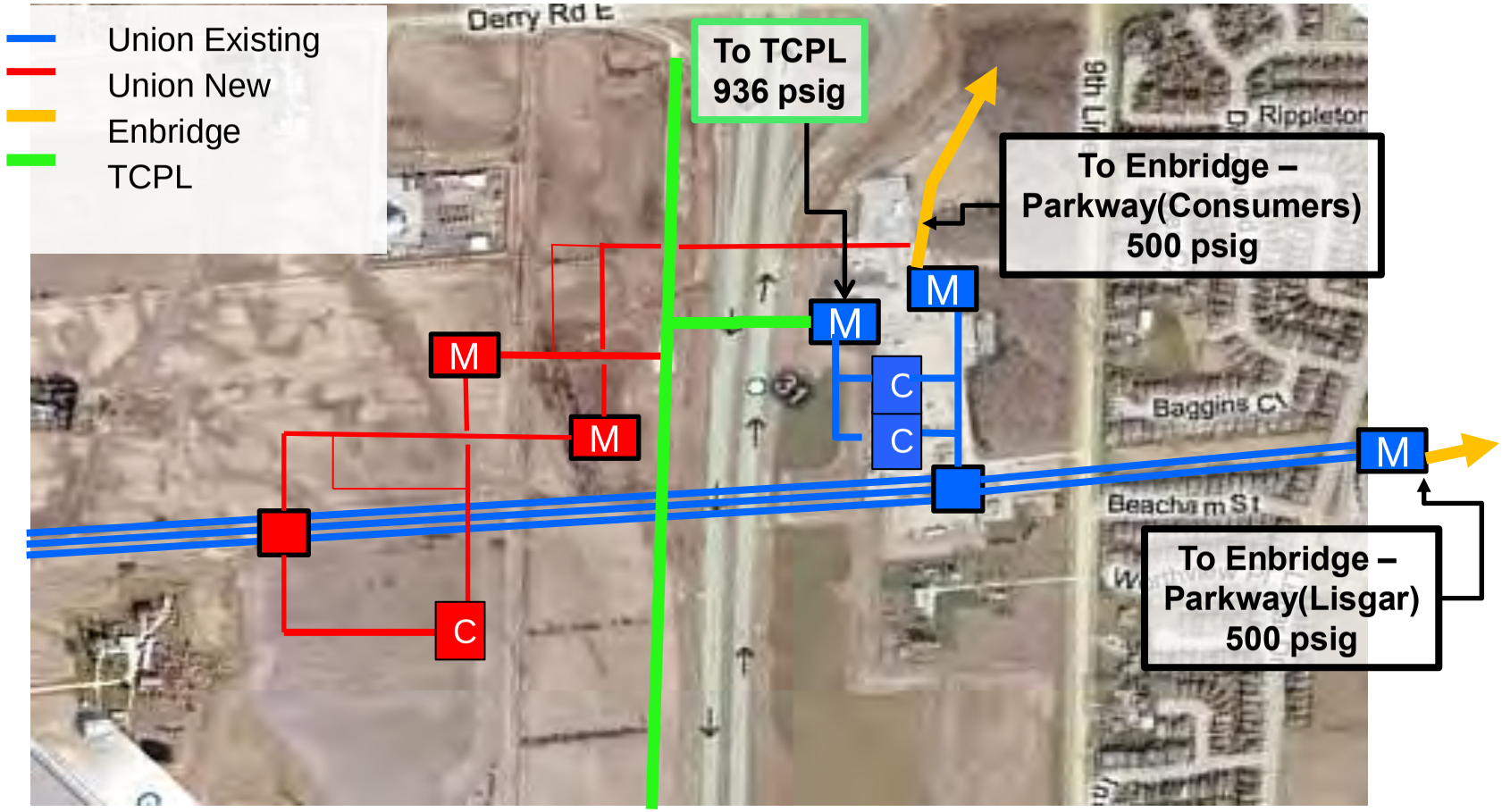
**Union has a safe and reliable system.**
**Change in market at Parkway driving Parkway West need.**

# Parkway West Proposal

- With increased reliance on Parkway compression service, need to provide Loss of Critical Unit protection
- Upgrade existing metering to custody transfer level for TCPL
- Develop a new West Station, complete with:
  - new metering
  - Install 2 new 20,000 HP compressors to complete LCU
  - Full emergency bypass piping - would allow gas to be re-routed in the event of any single emergency
- $220m of costs rolled into M12 rates
- Metering and bypass piping completed for 2013; Loss of Critical unit in 2014

# Location of Parkway West

# Parkway West Proposal




C Compressor

M Metering Stn

# Strategic Considerations of Parkway West

- Provides complete redundancy in case of an outage or incident
- Consistent with Loss of Critical Unit design philosophy
- Integrates with current & future flexibility of Parkway

# Next Steps

- Preliminary design
- Rate analysis
- Filed as part of next rate case
- Amend Interconnect agreements with TransCanada and Enbridge

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9

Preamble: Union announced a binding Open Season for the Parkway Extension Project on March 13, 2012 offering transportation service on a proposed new pipeline from an interconnect near the Union Gas Parkway Compressor Station to a new interconnect with the TransCanada Pipelines limited transmission system at or near Maple, Ontario. The Parkway Extension will operate in conjunction with the Parkway West Project facilities. Enbridge Gas Distribution is described as a joint owner (with Union) of a section of the Parkway Extension, with a view to interconnecting with the new pipeline to serve its own franchise.

a) Please provide the announcement of the open season and the bidders' open season package that accompanied the announcement.

b) Please provide a copy of each presentation that Union made to potential bidders regarding the Parkway Extension project.

c) Is the "new interconnect near the Union Gas Parkway Compressor Station" as described in the open season different or the same as the new interconnect to the EGD system as described in Exhibit B1, Tab9, Pg. 4. Please explain in detail the relationship between the two interconnections.

d) Has Union discussed the part of the Parkway West Project that consists of the second connection of the Dawn to Parkway system to the EGD system with EGD? If so, please provide any correspondence, presentations or meeting notes related to this discussion.

e) Did EGD submit a request to Union for the second connection of the Dawn to Parkway system to the EGD system? If so, please provide details, including any correspondence in which EGD made this request.

f) Is the second connection of the Dawn to Parkway system to the EGD system related to EGD's proposed GTA Reinforcement Project that was presented to Stakeholders on November 11, 2011, in any way? Please explain in detail.

g) Would the proposed Parkway West Project still provide sufficient LCU protection for deliveries to Parkway (TCPL) if Union's open season is successful?

h) If the answer to (g) is no, then what additional facilities will be required in conjunction with the Parkway Extension in order to continue to provide LCU protection at Parkway (TCPL)? Please provide details including size & location of such facilities.

---

**Response:**

a) The announcement and open season package released for the Parkway Extension Project on March 13, 2012 are attached as Attachments 1 and 2, respectively. On April 24, 2012 Union extended the duration of the open season and, based on feedback from the market, changed some of the open season parameters. The revised open season package is attached as Attachment 3.

b) Union considers presentations given to potential bidders regarding the Parkway Extension Project to be commercially sensitive material.

c) No. The "new interconnect near the Union Gas Parkway Compressor Station" associated with the Parkway Extension Project is not the same as the new interconnect to the EGD system as described in Exhibit B1, Tab 9, page 4 associated with the Parkway West Project. However, the connection associated with the Parkway Extension Project would likely be located at Parkway West.

d) Union has discussed with Enbridge the second connection of the Dawn-Parkway system to the Enbridge system, which is the part of the Parkway West Project. Correspondence with Enbridge regarding the second connection of the Dawn-Parkway system to the Enbridge system is subject to a confidentiality agreement.

e) Enbridge and Union discussed means to address reliability for deliveries at Parkway. No specific written request was provided for the second connection to the Dawn-Parkway system.

f) The second connection of the Dawn-Parkway system to the Enbridge system is intended to replicate and provide security and reliability for existing Enbridge feeds at Parkway. See response to c) above.

g) Yes.

h) N/A. Please see the response at g) above.

NEWS RELEASE

Union Gas Limited
50 Keil Drive North,
Chatham, ON N7M 5M1

March 13, 2012

CONTACT: Carrie Dudley-Tatsu
Phone: 1-800-571-8446 ext. 5424

# UNION GAS ANNOUNCES OPEN SEASON FOR NEW PIPELINE, CONNECTING PARKWAY TO MAPLE

**CHATHAM, Ontario** -- Union Gas Limited is holding a binding open season to solicit market support for new firm transportation capacity originating from an interconnect near the existing Union Gas Parkway compressor station to a new interconnect with the TransCanada system at or near Maple (the “Parkway Extension Project”).

The Parkway Extension Project will provide firm transportation capacity of over 0.5 PJ/d from Parkway to Maple.

This project will be an extension of the Union Gas Dawn to Parkway system that will provide secure access to diverse supplies of natural gas from the Union Gas Dawn Hub and serve a growing demand for natural gas in central, eastern and northern Ontario as well as Quebec and the U.S. Northeast. The Parkway Extension Project will give consumers a new transportation option that will increase supply diversity, while supporting the development of new natural gas infrastructure in Ontario.

Enbridge Gas Distribution Inc. is considering a pipeline project commencing at a new interconnect near the Union Gas Parkway compressor station that will upgrade its distribution system in the Greater Toronto Area. The Parkway Extension Project will consist of a segment of pipeline that will be jointly owned by Union Gas and Enbridge Gas Distribution and a second segment of pipeline that will be wholly owned by Union Gas.

"There are tremendous synergies created by Union Gas and Enbridge working together to build this important new infrastructure,” said Mark Isherwood, vice president of business development, storage and transmission at Union Gas. “The Parkway Extension Project will enhance Ontario’s ability to access diverse and competitive supply sources, which will support a growing Ontario economy and an increasing demand for affordable and reliable energy.”

Several key potential Shippers, including both Enbridge Gas Distribution and Gaz Métro Limited Partnership, have expressed interest in the proposed service that will provide increased diversity of supply and competitive energy options for Ontario and Quebec.

The Open Season is also seeking interest in transportation service on the Union Gas Dawn to Parkway system to provide capacity to feed the new pipeline. Shippers may bid on firm transportation from the Dawn Hub, Kirkwall, or Parkway to the new interconnect at Parkway or to Maple for service starting in 2014 or 2015. Union Gas is conducting the binding open seasons from March 13, 2012 through April 25, 2012.

**Open Season Contact**

For additional information, visit www.uniongas.com/openseason, contact your sales representative or:

Dale Van Der Meersch
Union Gas Limited
519-436-5276
dvandermeersch@uniongas.com

**About Union Gas**

Union Gas Limited is a major Canadian natural gas storage, transmission and distribution company based in Ontario with 100 years of experience and service to customers. The distribution business serves about 1.4 million residential, commercial and industrial customers in more than 400 communities across northern, southwestern and eastern Ontario. Union Gas's growing storage and transmission business offers premium storage and transportation services to customers at the Dawn Hub, the largest underground storage facility in Canada and one of the largest in North America. It offers customers an important link in the movement of natural gas from Western Canadian and U.S. supply basins to markets in central Canada and the northeast U.S. Union Gas, one of Canada's Top 100 Employers for 2012, is a Spectra Energy (NYSE: SE) company with assets of $5.6 billion and approximately 2,200 employees. For more information, visit uniongas.com.

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**CONTACT:**
Carrie Dudley-Tatsu
Manager, Internal and Executive Communications, Union Gas Limited
Ph: 519 436-5424 or 1-800-571-8446 ext. 5424
Cell: 519 359-5571 Fax: 519 436-4621
Email: cdudley-tatsu@uniongas.com

# Union Gas Limited Parkway Extension Project and Dawn to Parkway Binding Transportation Open Season

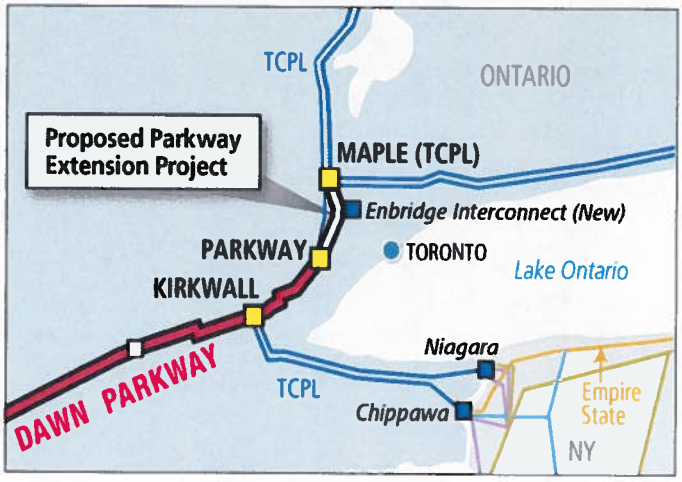
March 13, 2012

Union Gas Limited is pleased to announce a binding Open Season for the **Parkway Extension Project** offering transportation service on a proposed new pipeline from a new interconnect near the Union Gas Parkway Compressor station ("**Parkway**"), to a new interconnect with the TransCanada Pipelines Limited transmission system at or near Maple, Ontario ("**Maple**"). Union Gas is also conducting a concurrent Open Season on the Dawn to Parkway system to provide capacity to the new pipeline. Service on the Dawn to Parkway system would commence as early as late 2014. Service through the Parkway Extension Project would commence as early as 2015.

The Parkway Extension Project will provide firm transportation capacity of over 500 TJ/d from Parkway to Maple.

This project will be an extension of the Union Gas Dawn to Parkway system that will provide secure access to diverse supplies of natural gas from the Union Gas Dawn Hub and serve a growing demand for natural gas in central, eastern and northern Ontario as well as Quebec and the U.S. Northeast. The Parkway Extension Project will give consumers a new transportation option that will increase supply diversity, while supporting the development of new natural gas infrastructure in Ontario.

Enbridge Gas Distribution Inc. is considering a pipeline project commencing at a new interconnect near the Union Gas Parkway compressor station that will upgrade its distribution system in the Greater Toronto Area. The Parkway Extension Project will consist of a segment of pipeline that will be jointly owned by Union Gas and Enbridge Gas Distribution and a second segment of pipeline that will be wholly owned by Union Gas.

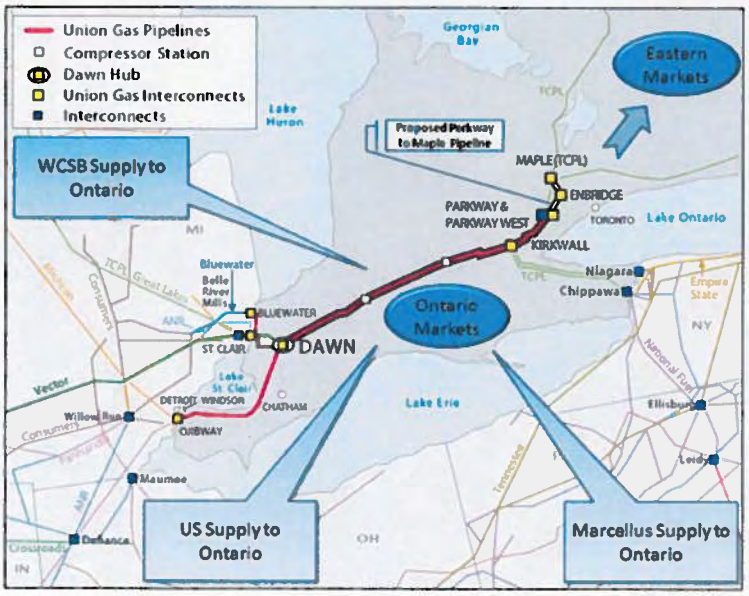



Several key potential Shippers, including both Enbridge Gas Distribution and Gaz Métro Limited Partnership, have expressed interest in the proposed service that will provide increased diversity of supply and competitive energy options for Ontario and Quebec.

Shippers may bid on firm transportation from the Dawn Hub or Kirkwall to the new interconnect at Parkway or to the existing Parkway delivery point for service starting as early as 2014. Shippers may also bid on firm transportation from the Dawn Hub, Kirkwall, or Parkway to Maple for service starting as early as 2015.

Union Gas plans to add the new path to the M12 transportation tariff in order to be able to offer a seamless transportation service from Dawn, Kirkwall and Parkway to Maple.

Union Gas is prepared to make the proposed new interconnect at Maple bi-directional, if there is sufficient market interest in a Maple to Parkway or Maple to Dawn Hub transportation service.




Shippers interested in a multi-point bi-directional service, similar to Union Gas' M12-X transportation service, or in F24-T firm all day service, with multiple nomination windows on any segment on the Dawn to Maple path, have the option to express interest in either of these proposed services during the Open Season. Union Gas would look to develop these services if sufficient Shipper interest exists and secure all OEB approvals required to offer these services. Once approved, Union Gas would then provide the opportunity during a subsequent Open Season to convert capacity contracted during this Open Season to either of these enhanced services.

As well, Union Gas is soliciting Shipper interest in fixed price tolls, for a 15 year period, for the Dawn to Maple, Parkway to Maple, and Kirkwall to Maple paths. Shippers may express interest in a fixed price toll at a premium to the initial cost of service rate.

The Parkway Extension Project and these transportation services will offer Shippers expanded access to the Dawn Hub, where Shippers can enjoy access to a liquid market with diverse gas supplies, Canada's largest premium storage facility and expanding markets. The Dawn Hub is strategically located and is well connected to several supply basins including the U.S. Midwest, U.S. Rockies, U.S. shale gas basins (Marcellus, Utica, Barnett and Haynesville) and the Western Canadian Sedimentary Basin.

Shippers who have end-use needs or market demands in the Toronto area, northern and eastern Ontario, Quebec, or the U.S. Northeast can benefit from the competitive, flexible

and reliable firm transportation options provided by the Parkway Extension Project and these transportation services.

**Proposed Services:**

Capacity would be available for the following proposed services, depending on market support:

1) ***Easterly firm transportation service through the new Parkway to Maple path originating from Dawn, Kirkwall or Parkway (includes option to convert existing Dawn to Parkway or Dawn to Kirkwall to Dawn to Maple); and***
2) ***Easterly firm transportation service originating at Dawn and delivered to Parkway; and***
3) ***Westerly firm transportation service, from Maple to Parkway or Dawn.***

***In total, Union Gas is proposing a maximum receipt capacity for new contracts originating from Dawn of 800 TJ/d, with up to 400 TJ/d starting as early as November 1, 2014 and a maximum receipt capacity for new contracts originating from Kirkwall of 500 TJ/d, with up to 300 TJ/d starting as early as November 1, 2014. In total Union Gas is offering 500 to 700 TJ/d of capacity on the proposed Parkway Extension Project from Parkway to Maple (New contracts plus conversion of existing contracts) starting November 1, 2015 with receipt points of Dawn, Kirkwall or Parkway. Union Gas is proposing up to 300 TJ/d of Westerly firm capacity from Maple to either Parkway or Dawn starting November 1, 2015.***

This Open Season closes at **2:00 pm EDT on April 25, 2012.**

1. **Service Description and Details:**

**Easterly Firm Transportation Service Parameters**

- Transportation service would commence as early as November 1, 2014 or November 1, 2015
- Receipt Point is one of **Dawn, Kirkwall, Parkway**
- Delivery Point is one of **Parkway or Maple**
- Term of the bid will be a **minimum term of 15 years**.
- Service is proposed to be in accordance with the Union Gas M12 Rate Schedule which will require changes to incorporate the services proposed and OEB approval.
- Demand and fuel rates will be subject to final project size and Shipper demands. The following cost of service M12 rates are anticipated (not including the fixed price option, if developed):

| Easterly Demand Charge Rates (C$/GJ/day) | | |
|---|---|---|
| Receipt Point | To Maple | To Parkway |
| Dawn | $0.10 - $0.15 | $0.08 - $0.10 |
| Kirkwall | $0.05 - $0.10 | $0.01 - $0.02 |
| Parkway | $0.02 - $0.07 | N/A |

- It is expected that the fuel requirement for service to Maple would be approximately 0.2% - 0.4% greater than the current Dawn to Parkway fuel rate. Fuel rates will be in accordance with the M12 Rate Schedule, subject to OEB approval.

View the current Rate Schedule, General Terms and Conditions and Standard Contract. The M12 Rate Schedule, M12 Schedule C – Fuel Ratios & Rates, and M12 Schedule D – Points and Pressures will be updated, pending OEB approval, to include the new services and rates.

**Westerly Firm Transportation Service Parameters**

- Transportation service would commence as early as November 1, 2015
- Receipt Point is **Maple**
- Delivery Point is one of **Parkway or Dawn**
- Term of the bid will be a **minimum term of 15 years.**
- Demand charge rate is expected to be **25% to 35%** of the Easterly demand charge rate. Both demand charge and fuel rates will be subject to OEB approval
- Service is proposed to be in accordance with the Union Gas C1 Rate Schedule and is subject to OEB approval.

View the Rate Schedule, General Terms and Conditions and Standard Contract. The C1 Rate Schedule and C1 Schedule C – Points and Pressures will be updated, pending OEB approval, to include the new services and rates.

**Term:**

As this expansion project requires a significant incremental capital investment and is being constructed during a period of changing gas supply dynamics, the term of these agreements is to be a minimum of fifteen (15) years. The facilities, rates and services included in this binding Open Season will be subject to Ontario Energy Board (OEB) approval.

## 2. Submitting a Binding Bid for Service

If you wish to participate in the Parkway Extension Project, please complete, sign and return the Firm Transportation Service Bid Form via email or fax to:

ATTN: Dale Van Der Meersch
Email: dvandermeersch@uniongas.com
Fax: (519) 436-4643

**Completed forms must be returned on or before 2:00pm EDT on April 25, 2012**

## Open Season Process:

This binding Open Season is being offered to assist Union Gas with determining facility design requirements to meet market needs. Union Gas will acknowledge Shipper's bid in writing on or before 4:00 p.m. Eastern Time on April 25, 2012. Union Gas will contact all responding parties who meet the requirements of the Open Season on or before April 30, 2012. Union Gas in its sole discretion reserves the right to reject any and all proposals received. Capacity requests that meet the respective service parameters during this Open Season will be awarded as per Union Gas' Allocation Procedures in Section XVI of the Union Gas M12 tariff General Terms & Conditions starting with those bids with the highest economic value. If the economic values of two or more independent bids are equal, then service shall be allocated on a pro-rata basis. The economic value shall be based on the net present value which shall be calculated based on the proposed per unit rate and the proposed term of the contract and without regard to the proposed Contract Demand **("NPV").**

Successful bidders will be expected to execute the Union Gas standard form M12 contract and a related Precedent Agreement, to cover any additional conditions precedent that are required by Union Gas and the Shipper that are not already covered in the Union Gas M12 General Terms & Conditions.

Any suggested Conditions Precedent that the Shipper proposes should be clearly articulated and attached to the bid form and will be considered during the capacity allocation process. Successful participants in the Open Season will be expected to enter into a definitive Precedent Agreement with Union Gas within 30 days of the Open Season closing. The Precedent Agreement will include several Conditions Precedent in favour of Union Gas pertaining to the project as well as any additional conditions precedent identified by the Shipper in its bid submission and negotiated with Union Gas.

A Financial Backstopping Agreement may also be required. The need for such an agreement will be determined by the facilities required to provide the transportation service requested by the Shipper. If costs are incurred prior to the Shipper or Union Gas waiving

their conditions precedent, the Shipper will be required to backstop their pro-rated costs until the conditions precedent are waived or satisfied. Contact your Account Manager or Dale Van Der Meersch to discuss the Financial Backstopping Agreement in more detail.

Pro-forma versions of agreements can be found on the Union Gas website at www.uniongas.com/openseason

Union Gas anticipates allocating capacity to successful bidders and executing the associated contracts no later than **May 25, 2012.**

If you have any questions about the Parkway Extension Project Open Season, please feel free to contact:

Dale Van Der Meersch, Project Manager, Business Development, (519) 436-5276; dvandermeersch@uniongas.com or your Account Manager.

uniongas
A Spectra Energy Company

**FIRM TRANSPORTATION SERVICE BID FORM** 

Please complete, sign and return this Firm Transportation Service Bid Form on or before 2:00 pm EDT on April 25, 2012, via email or fax to:

**ATTN:** Dale Van Der Meersch via
**Email:** dvandermeersch@uniongas.com or **Fax:** (519) 436-4643

**This is a binding bid, subject to specified conditions precedent.** The purpose of the Parkway Extension Project and the Dawn to Parkway Open Season is for Union Gas to determine the facility design requirements to support market needs. Union Gas will determine whether or not to proceed with offering any of the services defined in the Parkway Extension Project and the Dawn to Parkway Open Season based on the assessment of the results from this Open Season. By signing and returning this Firm Transportation Service Bid Form, Shipper may be contacted directly to transition to a M12 transportation contract, a related Precedent Agreement and potentially a Financial Backstopping Agreement. Pro-forma copies of each can be found at www.uniongas.com/openseason.

Shippers may submit more than one bid form. Please indicate your requirements below:

**Firm Transportation Service Binding Bid:**

Receipt Point ☐ **Dawn** ☐ **Kirkwall** ☐ **Parkway** ☐ **Maple**

Delivery Point ☐ **Maple** ☐ **Parkway** ☐ **Dawn**

Start Date (select one per bid) ☐ **Nov 1, 2014** **or** ☐ **Nov 1, 2015**

NEW Quantity Max _____ (GJ/d)

CONVERSION Quantity Max _____ (GJ/d) (from existing M12 capacity)

Contract Reference (e.g. M12000):_____

TOTAL (New + Conversion) Max _____ (GJ/d)

TERM (15 year minimum ending October 31) _____ (yrs)

Interest in Fixed Tolls: ☐

Interest in Firm all day service with additional nomination windows: ☐

Interest in bi-directional, multiple receipt point service: ☐

Is the bid subject to any additional conditions precedent in addition to the standard Preconditions in Section XXI of Union Gas' M12 General Terms and Conditions?

**Yes*** **No** (circle one) *If yes, please articulate those conditions in an attachment

Dated this _____ day of _____ 2012

**SHIPPER LEGAL NAME** _____

By: _____ _____

Signature: E-mail:

_____ _____

Name: Phone:

# Union Gas Limited Parkway Extension Project and Dawn to Parkway Binding Transportation Open Season

## Extended to May 4, 2012

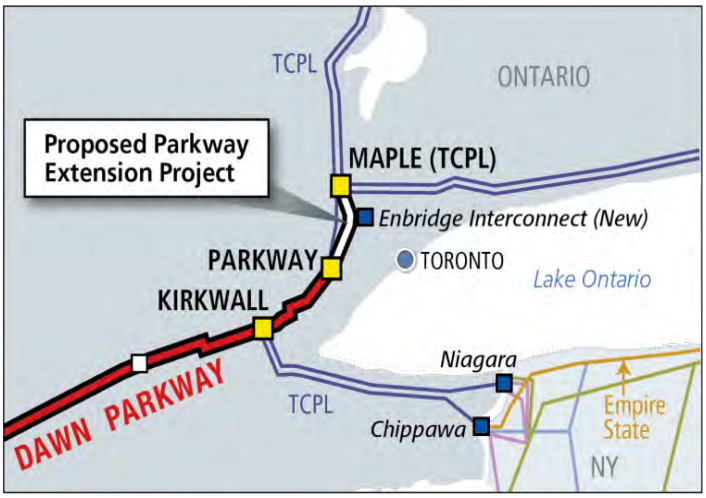
April 24, 2012

Responding to customer requests, Union Gas Limited is pleased to extend the Parkway Project Open Season. The closing for the Open Season has been extended to May 4, 2012. The **Parkway Extension Project** offers transportation service on a proposed new pipeline from a new interconnect near the Union Gas Parkway Compressor station ("**Parkway**"), to a new interconnect with the TransCanada Pipelines Limited transmission system at or near Maple, Ontario ("**Maple**"). Union Gas is also conducting a concurrent Open Season on the Dawn to Parkway system to provide capacity to the new pipeline. Service on the Dawn to Parkway corridor would commence as early as late 2014.

The Parkway Extension Project will provide firm transportation capacity of over 500 TJ/d from Parkway to Maple.

This project will be an extension of the Union Gas Dawn to Parkway system that will provide secure access to diverse supplies of natural gas from the Union Gas Dawn Hub and serve a growing demand for natural gas in central, eastern and northern Ontario as well as Quebec and the U.S. Northeast. The Parkway Extension Project will give consumers a new transportation option that will increase supply diversity, while supporting the development of new natural gas infrastructure in Ontario.

Enbridge Gas Distribution Inc. is considering a pipeline project commencing at a new interconnect near the Union Gas Parkway compressor station that will upgrade its distribution system in the Greater Toronto Area. The Parkway Extension Project will consist of a segment of pipeline that will be jointly owned by Union Gas and Enbridge Gas Distribution and a second segment of pipeline that will be wholly owned by

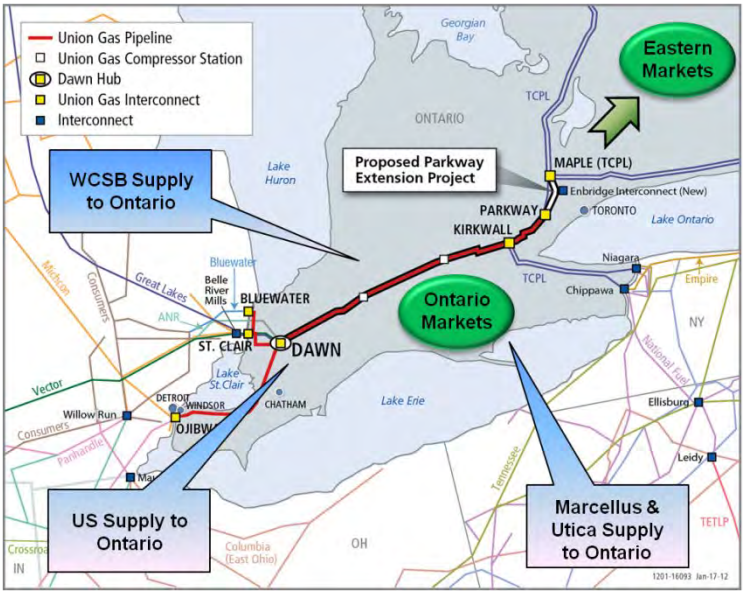


Union Gas.

Several key potential Shippers, including both Enbridge Gas Distribution and Gaz Métro Limited Partnership, have expressed interest in the proposed services that will provide increased diversity of supply and competitive energy options for Ontario and Quebec.

Shippers may bid on firm transportation on the new Dawn to Maple corridor for service starting as early as 2014. Service on the Dawn to Maple corridor includes firm transportation from the Dawn Hub, Kirkwall or Parkway to Maple. Service also includes the option to contract firm transportation from the Dawn Hub or Kirkwall to the new interconnect at Parkway or to the existing Parkway delivery point. Union Gas plans to add the new path to the M12 transportation tariff in order to be able to offer a seamless transportation service from Dawn, Kirkwall and Parkway to Maple.

Union Gas is prepared to make the proposed new interconnect at Maple bi-directional, if there is sufficient market interest in a Maple to Parkway or Maple to Dawn Hub transportation service.




Shippers interested in a multi-point bi-directional service, similar to Union Gas' M12-X transportation service, or in F24-T firm all day service, with multiple nomination windows on any segment on the Dawn to Maple path, have the option to express interest in either of these proposed services during the Open Season. Union Gas would look to develop these services if sufficient Shipper interest exists and secure all OEB approvals required to offer these services. Once approved, Union Gas would then provide the opportunity during a subsequent Open Season to convert capacity contracted during this Open Season to either of these enhanced services.

As well, Union Gas is soliciting Shipper interest in fixed price tolls, for a minimum term of 10 years for the Dawn to Maple, Parkway to Maple, and Kirkwall to Maple paths. Shippers may express interest in a fixed price toll at a premium to the initial cost of service rate.

The Parkway Extension Project and these transportation services will offer Shippers expanded access to the Dawn Hub, where Shippers can enjoy access to a liquid market with diverse gas supplies, Canada's largest premium storage facility and expanding markets. The Dawn Hub is strategically located and is well connected to several supply basins including the U.S. Midwest,

U.S. Rockies, U.S. shale gas basins (Marcellus, Utica, Barnett and Haynesville) and the Western Canadian Sedimentary Basin.

Shippers who have end-use needs or market demands in the Toronto area, northern and eastern Ontario, Quebec, or the U.S. Northeast can benefit from the competitive, flexible and reliable firm transportation options provided by the Parkway Extension Project and these transportation services.

**Proposed Services:**

Capacity would be available for the following proposed services, depending on market support:

1) Easterly firm transportation service through the new Parkway to Maple path originating from Dawn, Kirkwall or Parkway (includes option to convert existing Dawn to Parkway or Dawn to Kirkwall to Dawn to Maple); and
2) Easterly firm transportation service originating at Dawn or Kirkwall and delivered to Parkway; and
3) Westerly firm transportation service, from Maple to Parkway or Dawn.

Union Gas is proposing a maximum receipt capacity for new contracts originating from Dawn of up to 800 TJ/d, and a maximum receipt capacity for new contracts originating from Kirkwall of up to 500 TJ/d, starting as early as November 1, 2014. Union Gas is offering 500 to 700 TJ/d of capacity on the proposed Parkway Extension Project from Parkway to Maple (new contracts plus conversion of existing contracts) starting November 1, 2014 with receipt points of Dawn, Kirkwall or Parkway. Union Gas is proposing up to 300 TJ/d of Westerly firm capacity from Maple to either Parkway or Dawn starting November 1, 2014.

This Open Season closes at **12:00 p.m. EDT (noon) on May 4, 2012.**

## 1. Service Description and Details:

### Easterly Firm Transportation Service Parameters

- Transportation service would commence as early as November 1, 2014 or November 1, 2015
- Receipt Point is one of **Dawn, Kirkwall, Parkway**
- Delivery Point is one of **Parkway or Maple**
- Term of the bid will be a **minimum term of 10 years**.
- Service is proposed to be in accordance with the Union Gas M12 Rate Schedule which will require changes to incorporate the services proposed and OEB approval.
- Demand and fuel rates will be subject to final project size and Shipper demands. The following cost of service M12 rates are anticipated (not including the fixed price option, if developed):

| Easterly Demand Charge Rates (C$/GJ/day) | | |
|---|---|---|
| **Receipt Point** | **To Maple** | **To Parkway** |
| Dawn | $0.10 - $0.15 | $0.08 - $0.10 |
| Kirkwall | $0.05 - $0.10 | $0.01 - $0.02 |
| Parkway | $0.02 - $0.07 | N/A |

- It is expected that the fuel requirement for service to Maple would be approximately 0.2% - 0.4% greater than the current Dawn to Parkway fuel rate. Fuel rates will be in accordance with the M12 Rate Schedule, subject to OEB approval.

View the current Rate Schedule, General Terms and Conditions and Standard Contract. The M12 Rate Schedule, M12 Schedule C – Fuel Ratios & Rates, and M12 Schedule D – Points and Pressures will be updated, pending OEB approval, to include the new services and rates.

**Westerly Firm Transportation Service Parameters**

- Transportation service would commence as early as November 1, 2014
- Receipt Point is **Maple**
- Delivery Point is one of **Parkway or Dawn**
- Term of the bid will be a **minimum term of 10 years.**
- Demand charge rate is expected to be **25% to 35%** of the Easterly demand charge rate. Both demand charge and fuel rates will be subject to OEB approval
- Service is proposed to be in accordance with the Union Gas C1 Rate Schedule and is subject to OEB approval.

View the Rate Schedule, General Terms and Conditions and Standard Contract. The C1 Rate Schedule and C1 Schedule C – Points and Pressures will be updated, pending OEB approval, to include the new services and rates.

## 2. Submitting a Binding Bid for Service

If you wish to participate in the Parkway Extension Project, please complete, sign and return the Firm Transportation Service Bid Form via email or fax to:

ATTN: Dale Van Der Meersch
Email: dvandermeersch@uniongas.com
Fax: (519) 436-4643

**Completed forms must be returned on or before 12:00 p.m. EDT (noon) on May 4, 2012**

## Open Season Process:

This binding Open Season is being offered to assist Union Gas with determining facility design requirements to meet market needs. Union Gas will acknowledge Shipper's bid in writing on or before 4:00 p.m. Eastern Time on May 4, 2012. Union Gas will contact all responding parties who meet the requirements of the Open Season on or before May 11, 2012. Union Gas in its sole discretion reserves the right to reject any and all proposals received. Capacity requests that meet the respective service parameters during this Open Season will be awarded as per Union Gas' Allocation Procedures in Section XVI of the Union Gas M12 tariff General Terms & Conditions starting with those bids with the highest economic value. If the economic values of two or more independent bids are equal, then service shall be allocated on a pro-rata basis. The economic value shall be based on the net present value which shall be calculated based on the proposed per unit rate and the proposed term of the contract and without regard to the proposed Contract Demand **("NPV").**

Successful bidders will be expected to execute the Union Gas standard form M12 contract and a related Precedent Agreement, to cover any additional conditions precedent that are required by Union Gas and the Shipper that are not already covered in the Union Gas M12 General Terms & Conditions.

Any suggested Conditions Precedent that the Shipper proposes should be clearly articulated and attached to the bid form and will be considered during the capacity allocation process. Successful participants in the Open Season will be expected to enter into a definitive Precedent Agreement with Union Gas within 30 days of the Open Season closing. The Precedent Agreement will include several Conditions Precedent in favour of Union Gas pertaining to the project as well as any additional conditions precedent identified by the Shipper in its bid submission and negotiated with Union Gas.

A Financial Backstopping Agreement may also be required. The need for such an agreement will be determined by the facilities required to provide the transportation service

requested by the Shipper. If costs are incurred prior to the Shipper or Union Gas waiving their conditions precedent, the Shipper will be required to backstop their pro-rated costs until the conditions precedent are waived or satisfied. Contact your Account Manager or Dale Van Der Meersch to discuss the Financial Backstopping Agreement in more detail.

Pro-forma versions of agreements can be found on the Union Gas website at www.uniongas.com/openseason

Union Gas anticipates allocating capacity to successful bidders and executing the associated contracts within 30 days of the Open Season closing.

If you have any questions about the Parkway Extension Project Open Season, please feel free to contact:

Dale Van Der Meersch, Project Manager, Business Development, (519) 436-5276; dvandermeersch@uniongas.com or your Account Manager.

**FIRM TRANSPORTATION SERVICE BID FORM** **Page 1 of 1**

Please complete, sign and return this Firm Transportation Service Bid Form on or before 12:00 p.m. EDT (noon) on May 4, 2012, via email or fax to:

**ATTN:** Dale Van Der Meersch via
**Email:** dvandermeersch@uniongas.com or **Fax:** (519) 436-4643

**This is a binding bid, subject to specified conditions precedent.** The purpose of the Parkway Extension Project and the Dawn to Parkway Open Season is for Union Gas to determine the facility design requirements to support market needs. Union Gas will determine whether or not to proceed with offering any of the services defined in the Parkway Extension Project and the Dawn to Parkway Open Season based on the assessment of the results from this Open Season. By signing and returning this Firm Transportation Service Bid Form, Shipper may be contacted directly to transition to a M12 transportation contract, a related Precedent Agreement and potentially a Financial Backstopping Agreement. Pro-forma copies of each can be found at www.uniongas.com/openseason.

Shippers may submit more than one bid form. Please indicate your requirements below:

**Firm Transportation Service Binding Bid:**

Receipt Point ☐**Dawn** ☐**Kirkwall** ☐**Parkway** ☐**Maple**

Delivery Point ☐**Maple** ☐**Parkway** ☐**Dawn**

Start Date (select one per bid) ☐**Nov 1, 2014** **or** ☐**Nov 1, 2015**

NEW Quantity Max _____ (GJ/d)

CONVERSION Quantity Max _____ (GJ/d) (from existing M12 capacity)

Contract Reference (e.g. M12000):_____

TOTAL (New + Conversion) Max _____ (GJ/d)

TERM (10 year minimum ending October 31) _____ (yrs)

Interest in Fixed Tolls: ☐

Interest in Firm all day service with additional nomination windows: ☐

Interest in bi-directional, multiple receipt point service: ☐

Is the bid subject to any additional conditions precedent in addition to the standard Preconditions in Section XXI of Union Gas' M12 General Terms and Conditions?

**Yes*** **No** (circle one) ***If yes, please articulate those conditions in an attachment**

Dated this _____ day of _____ 2012

**SHIPPER LEGAL NAME** _____

By: _____ _____

Signature: E-mail:

_____ _____

Name: Phone:

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pgs 5-6

Preamble: Union discusses its proposal to add Parkway West Metering and Header facilities and states "Union proposes to install i) headers and custody transfer metering to connect the Dawn to Parkway system to the EGD system at the proposed Parkway West station, which will provide EGD with a secure feed in the event of an outage of the existing Parkway (Consumers) feed".

a) The stated intent of these facilities is to "provide EGD with a secure feed in the event of an outage of the existing Parkway (Consumers) feed". Would these facilities be used only in the event of an outage of the existing Parkway (Consumers) feed? Please explain.

b) If these facilities would be used in any event other than an outage of the existing Parkway (Consumers) feed, please explain in detail when and how they would be used.

c) Would the second interconnection with EGD alter the capability of Union to deliver to EGD, and/or EGD to take, volumes of gas? If so, please provide a detailed explanation of the change in Union and/or EGD capabilities.

d) Likewise are the proposed headers to connect the new Parkway compression to the TCPL system to be used only in the event of an outage of a Parkway compressor or associated piping?

e) If the proposed headers connecting the new Parkway compression to the TCPL system would be used in any event other than an outage of a Parkway compressor, please explain in detail when and how they would be used.

---

**Response:**

a) The primary purpose is to provide Enbridge with a secure feed into their system in the event of an outage impacting the connection to Enbridge at the existing Parkway Compressor Station. Union expects that deliveries nominated to Parkway (Consumers) will primarily be delivered through the existing connection at the Parkway Compressor Station. There may be opportunities to use the new connection proposed as part of the Parkway West Project during operation and maintenance activities. Union plans to utilize its Parkway facilities to meet

delivery obligations to Enbridge in the most efficient manner.

b) Please see the response at a) above.

c) The new connection for the Parkway West Project is intended to replicate the delivery capabilities to Enbridge at the existing Parkway Compressor Station.

d) The primary purpose of the proposed compression and associated piping to tie into the TCPL system is to meet nominated Parkway (TCPL) deliveries in the event of an outage of one of the compressors at the existing Parkway Compressor Station. Similar to Dawn and Lobo/Bright, Union will utilize all of its facilities to meet delivery obligations at Parkway (TCPL) in the most efficient manner while ensuring enough horsepower is held in reserve to cover Loss of Critical Unit through the proposed Parkway West Project compression facilities, the existing Parkway compressors or a combination of both.

e) Please see the response at d) above.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pg 6

Preamble: Union discusses its proposal to add LCU protection at Parkway by installing approximately 40,000 HP of compression and that no capacity created by the LCU protection at Parkway will be sold as firm transportation capacity.

a) How much additional capacity will the new Parkway compression provide?

b) Are there any additional firm transportation contracted volumes supporting the proposed addition of the new Parkway compression facilities? If so please provide details.

c) Union states that "no capacity created by the LCU protection at Parkway will be sold as firm transportation capacity."

   i) Would Union use the new compression to provide non-firm services? If so, please explain in detail.

   ii) What would prevent Union from selling this LCU protection capacity as firm services in the future?

   iii) If the LCU protection capacity will be used to provide discretionary services, please explain:

      (a) who pays for the costs of the facilities;

      (b) who receives the revenues generated by the discretionary services.

---

**Response:**

a) The proposed Parkway West Project is not planned to create any additional capacity.

As discussed at Exhibit J.B-1-7-10 d), Union will use all of its facilities to meet delivery obligations at Parkway (TCPL) in the most efficient manner while ensuring enough horsepower is held in reserve to cover Loss of Critical Unit ("LCU") through the proposed Parkway West Project compression facilities, the existing Parkway compressors or a combination of both.

Union will not sell any part of the capacity required for LCU as transportation capacity. As such, there are no additional firm transportation contracted volumes supporting the addition

of LCU coverage for Parkway.

b) Please see the response at a) above.

c) Please see the response at a) above.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pg 3 of 6, lines 15 - 17

Preamble: TransCanada wishes to better understand the capabilities and impacts of loss of unit conditions at Parkway.

a) Please provide the following information for each of the Parkway A Unit, the Parkway B Unit, and the Parkway Compressor Station at winter design day conditions for the 2013/2014 winter assuming the maximum deliveries to Parkway (TCPL) that the system is capable of delivering:

   i) power available;

   ii) power required;

   iii) suction pressure;

   iv) discharge pressure;

   v) compression ration;

   vi) flow; and

   vii) fuel consumption.

b) Please provide the same information as requested in request (a) for the scenarios involving (1) the loss of the Parkway A Unit and (2) the loss of the Parkway B Unit.

c) Please provide the same information requested in request (a) and (b) but assume that the delivery pressure requirements to TransCanada are 150 kPa lower than Union's current design pressure.

d) Please provide the same information as requested in request (a) and (b) but assume that the delivery pressure requirements to TransCanada are 300 kPa lower than Union's current design pressure.

**Response:**

a)

| Peak Hour Winter 13/14 Design Day Conditions | Power Available (MW) | Power Required (MW) | Suction Pressure (kPag) | Discharge Pressure (kPag) | Compression Ratio | Flow (PJ/d) | Fuel Consumption (TJ/d) |
|---|---|---|---|---|---|---|---|
| Parkway (Total) | 52.9 | 52.8 | 3655 | 6450 | 1.77 | 2.538 | 11.9 |
| Parkway A | 18 | 18 | 3655 | 6450 | 1.77 | 0.868 | 4.2 |
| Parkway B | 34.9 | 34.8 | 3655 | 6450 | 1.77 | 1.670 | 7.7 |

The total flow noted in the table above is higher than the estimated capacity of approximately 2.0 PJ/d for the measurement and downstream piping owned and operated by TCPL.

b)

| Peak Hour Winter 13/14 Design Day Conditions | Power Available (MW) | Power Required (MW) | Suction Pressure (kPag) | Discharge Pressure (kPag) | Compression Ratio | Flow (PJ/d) | Fuel Consumption (TJ/d) |
|---|---|---|---|---|---|---|---|
| Loss of Parkway A | 34.9 | 34.9 | 4247 | 6450 | 1.52 | 2.022 | 8.1 |
| Loss of Parkway B | 18 | 18 | 4792 | 6450 | 1.35 | 1.409 | 4.8 |

Based on the table above, loss of Parkway B results in a shortfall of approximately 0.9 PJ/d without Loss of Critical Unit protection after the proposed TCPL facilities are completed in 2012/2013. Loss of Parkway A would result in a shortfall of approximately 0.3 PJ/d. At a total throughput of 3.0 PJ/d, loss of Parkway B results in a shortfall of approximately 1.6 PJ/d and loss of Parkway A results in a shortfall of approximately 1.0 PJ/d.

c) This scenario is hypothetical as it deviates from Union's contractual obligation to TCPL. A reduced discharge pressure in the event of a failure primarily benefits the case of a loss of Parkway B. In this case, the Parkway A compressor is able to compress 1.437 PJ/d to TCPL, which represents an increase of approximately 0.028 PJ/d.

d) This scenario is hypothetical as it deviates from Union's contractual obligation to TCPL. A reduced discharge pressure in the event of a failure primarily benefits the case of a loss of Parkway B. In this case, the Parkway A compressor is able to compress 1.465 PJ/d to TCPL, which represents an increase of approximately 0.056 PJ/d.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, pg 3 of 6, lines 15 - 17

Preamble: TransCanada wishes to better understand the existing facilities in the Parkway / Lisgar area and the potential for restrictions to service.

a) Please provide a schematic of all the facilities between Parkway and Lisgar including all pipes, compressors, meters, and valves and including the following information:

   i) For each pipe, the diameter and the maximum allowable operating pressure (MAOP).
   ii) For each meter, the capacity of the meter.
   iii) Fore each valve:
      (a) its size;
      (b) its MAOP;
      (c) whether the valve is normally open or closed or a regulator; and
      (d) whether the valve can be remotely operated from Union's gas control.

b) Please provide the distance between the Parkway facilities and the Lisgar facilities.

c) Please indicate what facilities and what events would be involved in an outage of the existing Parkway interconnect that would result in no gas being delivered to Parkway (Consumers) and Lisgar.

---

**Response:**

a) Please see the response at Exhibit J.B-1-7-14. The level of detail requested is not relevant to the current application.

b) The distance is approximately 2.1 km.

c) As indicated at Exhibit B1, T9, Page 4, Lines 11-13, "An outage of the Dawn to Parkway system interconnection at Parkway (including the valve site) would results in no gas being delivered to Parkway (Consumers) and Lisgar". This could be the result of failures on the pipeline system west of Parkway or a failure at the Parkway Valve site (connects the Parkway compressor station to the Dawn-Parkway system).

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Ref: Exhibit B1, Tab 9, pg 5, lines 1 – 8
Exhibit B1, Tab 9, Schedule 1
Union's March 13, 2012 open season announcement for the Parkway to Maple extension, proposing 500-700 TJ/d service from Parkway to Maple commencing November 1, 2015.

Preamble: TransCanada wishes to better understand how the facilities associated with Union's open season for services from Dawn to locations including Maple in the 2014/2015 timeframe would integrate with:

i) the facilities associated with the estimated growth in demand at Parkway to more than 3.0 PJ/d by 2015/2016;

ii) the proposed Parkway West Project; and

iii) the existing facilities in the Parkway / Lisgar area.

a) Please provide a schematic of all of the existing and proposed facilities in the Parkway and Lisgar area for the 2012 / 2013 Gas Year, including the same information requested in Interrogatory 13 a).

b) Please provide a schematic of all of the existing and proposed facilities in the Parkway and Lisgar area for the 2013 / 14 Gas Year, including the same information requested in Interrogatory 13 a).

c) Please describe:

i) how the proposed Parkway West Project and/or existing parkway facilities will be expanded or modified to meet Union's estimated demand of more than 3.0 PJ/d of deliveries from parkway by 2015/2016; and
ii) when Union anticipates adding these facilities.

d) Please describe any facilities additions or modifications to the proposed Parkway West Project facilities and/or the existing Parkway facilities associated with providing 500 TJ/d of deliveries to TransCanada at Maple.

e) Please provide the same information requested in (d), but in relation to deliveries to TransCanada at Maple of 700 TJ/d.

f) Please provide Union's forecast total annual deliveries (in GJ) and average daily deliveries (in GJ/d) to Parkway (TCPL) and Parkway (Consumers) for each of the years 2012 to 2016.

g) Please describe the interrelation of:
   i) the existing Parkway compression and facilities;
   ii) the proposed Parkway West Project facilities;
   iii) the facilities associated with the estimated growth in demand to more than 3.0 PJ/d at Parkway by 2015/2016; and
   iv) the compression and facilities associated with the Parkway to Maple pipeline project for 2014/2015 with the loss of critical unit protection that will be available for deliveries to TransCanada (at Parkway) with the facilities additions or modifications discussed in the response to (ii), (iii) and (iv) above, for each year from 2012 to 2016, including for each year:
      (a) the facilities that would be in place;
      (b) the capability of Union to deliver at Parkway on a design day; and
      (c) the percentage of loss of critical unit protection that will be available for deliveries to TransCanada at Parkway.

---

**Response:**

a) Please see Attachment 1. This schematic shows existing facilities in the Parkway and Lisgar area. No changes are planned for Gas Year 2012/2013.

b) Please see Attachment 1. No facility additions will be put in-service for the winter of 2013/2014 in the Parkway and Lisgar area. The Parkway West Project is proposed to be in-service November 1, 2014.

c)
   i) Responses to Union's Open Season for capacity on the Dawn-Parkway system and the proposed Parkway Extension Project are expected on May 4, 2012. A copy of the Open Season package is provided at Exhibit J.B-1-7-9 a). Union will be reviewing any bids received as a result of that Open Season and will follow the procedure outlined in the Storage and Transportation Access Rule under Section 2.2: Standards for Transportation Open Seasons with respect to posting Open Season information.

Facility design for the Parkway Extension Project will not be completed until capacity has been awarded based on specific contract quantities, receipt and delivery points. Subject to sufficient market support, new pipeline would be required between Parkway and Maple, including a portion jointly developed with Enbridge that captures synergies between Union's Parkway Extension Project and Enbridge's GTA Project. It is expected that additional compression will be required to support a new pipeline east of Parkway. That compression would be located at the Parkway West site and could be protected by the Loss of Critical Unit horsepower proposed as part of the Parkway West Project.

No further compression is required at the existing Parkway Compressor Station to serve the additional volumes associated with the TCPL 2012 Eastern Mainline Expansion.

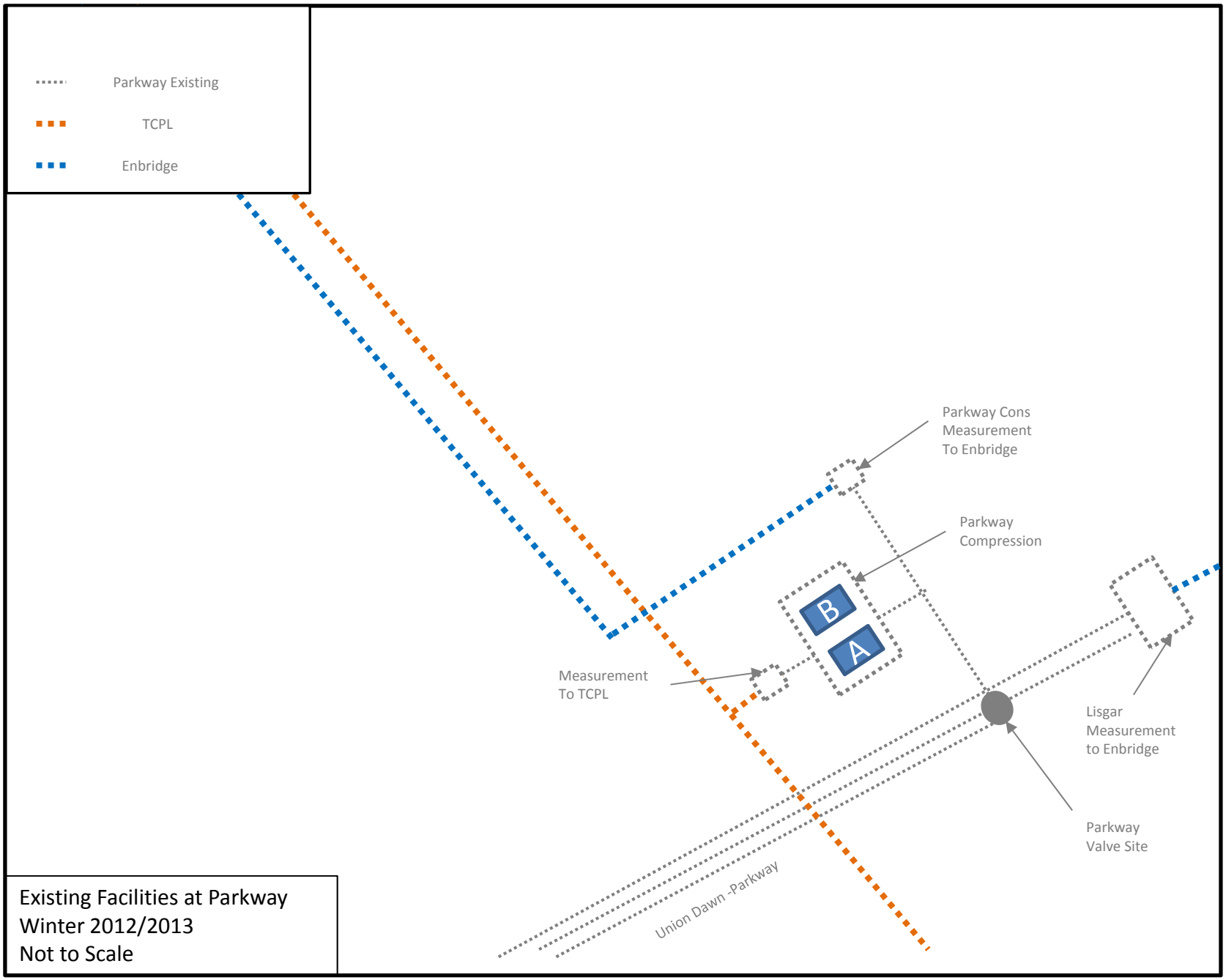
ii) Please see the response at c) i) above and at Exhibit J.B-1-7-9 a).

d) Please see the response at c) i) above.

e) Please see the response at c) i) above.

f) Please see the response at Exhibit J.B-1-7-1.

g) Please see the response at a) – c) above, Exhibit J.B-1-1-2 a), Exhibit J.B-1-7-5 and Exhibit J.B-1-13-4 c) iii). The percentage of LCU protection in 2012/2013 is 57%.




Filed: 2012-05-04
EB-2011-0210
J.B-1-7-14
Attachment 1

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit A2, Tab 1, Schedule 1, pg 12, lines 7 – 9

Preamble: TransCanada wishes to better understand Union's view of the TransCanada capacity constraint at Maple.

a) Please confirm that Union is aware of several new capacity open seasons that TransCanada has conducted since 2007 that solicited interest in transportation capacity from points such as parkway and Dawn on the Canadian Mainline.

b) Has Union bid into any such new capacity open season for capacity originating at Parkway? Please provide the details of all such bids submitted along with the current status of such bids.

c) Is Union aware of any circumstance where TransCanada refused to provide service to potential shippers that bid into the new capacity open seasons? If so, please describe the circumstances.

---

**Response:**

a) Confirmed. Union is aware that TCPL has conducted open seasons since 2007 soliciting interest for transportation capacity from points such as Parkway and Dawn. The result of a previous TCPL open season aimed at transporting Marcellus natural gas to all points on their system is TCPL's Section 58 Application for the 2012 Eastern Mainline Expansion Project that is currently before the National Energy Board. TCPL is also currently conducting a similar open season aimed at transporting Marcellus natural gas to all points on their system.

In addition, TCPL or its affiliates have proposed numerous other projects to move natural gas from diverse supply sources to market in the past 6-7 years that would presumably compete with long haul Mainline flows from the Western Canadian Sedimentary Basin, such as:

- the LNG facility at Gros Cacouna in Quebec;
- the Dawn Express Pipeline Project connecting ANR at Willow Run to Dawn;
- the Dawn Eclipse Pipeline Project connecting Great Lakes Gas Transmission to Dawn;
- the Corunna Expansion Project connecting the Great Lakes Gas Transmission system to Niagara Gas Transmission;

- the Bison Pipeline connecting production in the Dead Horse region in Wyoming to the Northern Border Pipeline; and,
- the NYMARC Project connecting Marcellus gas supplies to the Iroquois Gas Transmission System.

b) Union submitted three conditional bids into the TCPL Open Season between July 5, 2010 and August 25, 2010 for new capacity that were awarded by TCPL:

i. Union Parkway Belt to EDA for 20,000 GJ/d
ii. Union Parkway Belt to NDA for 10,000 GJ/d
iii. Niagara to Kirkwall for 21,101 GJ/d

Union and TCPL were able to execute a Precedent Agreement on January 14, 2011 for the Niagara to Kirkwall capacity. Union and TCPL were not able to come to terms agreeable to both parties on the Precedent Agreements for the contracts originating at Parkway. As of April 16, 2012, Union has not received the contract documents for the Niagara-Kirkwall transportation awarded in the August 2010 Open Season.

In a subsequent TCPL Open Season in the spring of 2011, Union submitted two conditional bids into the TCPL Open Season for new capacity:

i. Union Parkway Belt to EDA for 20,000 GJ/d
ii. Union Parkway Belt to NDA for 10,000 GJ/d

Again, Union and TCPL were not able to come to terms agreeable to both parties for the contracts originating at Parkway.

c) Union is not aware of any circumstance where TransCanada has refused to provide service to potential shippers that bid into the new capacity open seasons.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit A2, Tab 3, Schedule 2, pg 1, lines 3-4
2006 Trafalgar Expansion Program Application[1] Section 5

Preamble: TransCanada requires more detail regarding the economics of the Parkway West Project.

Please provide the Discounted Cash Flow (DCF) analysis for the Parkway West Project in the same format as the second reference. Please also include a detailed explanatory for the revenue estimates.

---

**Response:**

The project does not create incremental revenues for use in a DCF analysis.

Please see the response at Exhibit J.B-1-7-11.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Ref: Exhibit B1, Tab 5, pgs 8-10
Exhibit G3, Tab 1, pgs 14-15

Preamble: TransCanada wishes to better understand Union's explanation of the firm east end deliveries that are relied upon to lower costs and the specific manner in which those deliveries lower costs.

a) Please provide the following information in relation to Union's Parkway obligation requirement:
   i) Using letters to designate customers (e.g. "Customer A", "Customer B"), please provide a table listing, for each year (calendar or gas year) from 2002 to 2012:
   ii) the Parkway obligation of each in-franchise direct purchase customer, and Union on behalf of sales service customers;
   iii) the interconnected transmission lateral(s) that is/are used to serve the customer and Union on behalf of sales service customers;
   iv) each customer's Dawn-Parkway and Kirkwall-Parkway contracted capacity and the type of contract;
   v) each customer's actual deliveries at Parkway;
   vi) Union's actual deliveries at Parkway on behalf of sales service customers;
   vii) the path over which each customer physically flowed gas to meet its Parkway obligation; and
   viii) the path over which Union physically flowed gas to meet its Parkway obligation on behalf of sales service customers.

b) How do Union customers with Parkway obligations inform Union that they have, on a given day, met their Parkway obligations?

c) How does Union confirm that its customers with Parkway obligations have met their obligations by delivering the required quantity of gas at Parkway?

d) How does Union ascertain the path over which the customer has met its Parkway obligation?

**Response:**

a)

i) Please see Attachment 1.

ii) Union has several hundred individual in-franchise direct purchase contracts in its Southern operations area, including contracts with a DCQ as small as 4 GJ/day. Instead of providing the Parkway obligation for each individual in-franchise direct purchase customer, the information has been provided for direct purchase customer categories (bundled T general service, bundled T contract rate, T1, T3, and unbundled).

Please see Attachment 1.

iii) The Dawn-Parkway interconnected laterals used to serve in-franchise customers on behalf of sales service customers are listed in Attachment 3 of the response to Exhibit J.G-1-7-5.

iv) Please see the response at J.G-1-7-2 b) iii).

v) Each direct purchase customer's actual deliveries at Parkway would be equal to the planned quantities from answer ii) above adjusted for temporary suspensions or diversions or contract amendments that occur after the planning date.

vi) Sales service actual deliveries at Parkway would be equal to the planned quantities from answer ii) above adjusted for daily demands and contract amendments that occur after the planning date.

vii) Union is not privy to how customers physically flow gas to meet their Parkway obligation. Customers can use a variety of options to meet their Parkway obligation. Customers may use TCPL Empress to Union CDA capacity (many different TCPL services – FT, STFT), TCPL Dawn to Union CDA capacity, Union Dawn to Parkway transportation, delivered third party services (purchases at Parkway).

viii) Union meets the Parkway obligation on behalf of sales service customers through a combination of alternatives. These include but aren't limited to TCPL Empress to Union CDA deliveries, TCPL Dawn to Union CDA deliveries and Union Dawn to Parkway transportation.

b) Direct purchase customers that have a Parkway delivery obligation are required to submit a nomination to Union which includes the quantity of gas to be delivered to Union at Parkway. The quantity of gas to be delivered will be equal to their daily obligated quantity.

c) Union confirms that direct purchase customers have met their daily Parkway delivery obligations through a validation process that compares nominated deliveries to Union at Parkway to the contracted obligations.

d) Union does not need to ascertain the supply path for direct purchase customers with a Parkway delivery obligation.

Parkway Deliveries by Service Type/Rate Class

| Line No. | Volumes (GJ/d) | January 2007 | January 2008 | January 2009 | January 2010 | January 2011 | January 2012 |
|---|---|---|---|---|---|---|---|
| 1 | Total South System | 106,660 | 104,172 | 83,951 | 119,019 | 109,229 | 90,286 |
| 2 | Total South Bundled T - General Service | 116,286 | 99,747 | 87,817 | 85,953 | 77,941 | 76,260 |
| 3 | Total South Bundled T - Contract | 129,764 | 145,217 | 132,190 | 118,929 | 100,383 | 96,716 |
| 4 | Total T-1 | 262,465 | 219,777 | 244,217 | 214,811 | 353,038 | 346,929 |
| 5 | Total T-3 | 30,195 | 32,268 | 33,268 | 32,268 | 32,268 | 32,079 |
| 6 | Total Unbundled | 14,800 | 28,353 | 31,182 | 28,435 | 25,058 | 15,313 |
| 7 | Total Parkway Deliveries | 660,170 | 629,535 | 612,625 | 599,415 | 697,917 | 657,583 |

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Summary Schedule 2, pg 3, line 55

Preamble: TransCanada is seeking clarity with respect to Union's concerns with the metering at Parkway.

a) Please confirm that the reference to "TCPL measurement" is to the Union measurement facilities at the interconnect with TransCanada and that to Union's knowledge the TransCanada measurement facilities do meet all standards for custody transfer measurement. If not confirmed please explain why.

b) Please explain and quantify the costs associated with the current process for the reconciliation of volumes at Parkway and explain the extent, if at all, to which those costs will be reduced by the metering replacement project.

---

**Response:**

a) The term "TCPL measurement" in Union's evidence refers to Union's measurement at the TCPL interconnect at Parkway.

Union operates with the understanding that TCPL's measurement, at the interconnect between Union and TCPL, meets all of Measurement Canada's requirements for custody transfer quality. Union cannot confirm that TCPL is meeting the required standards as Union is not the operator of that facility.

b) Union's existing check measurement facilities do not currently meet internal Company standards, which require check measurement to meet Measurement Canada custody transfer requirements. The proposed upgrade will increase the accuracy of Union's check measurement facilities, reducing the risk of measurement discrepancies to Union and other ex-franchise customers. Union anticipates there will be some cost savings associated with improved check measurement accuracy.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 4, pgs 4-7

Preamble: Union provides a summary of Capital spending in the distribution area in excess of 1 million dollars under Specific Projects.

a) For Ontario Power Generation – Thunder Bay Specified Project:

   i) Please provide a complete description of this project including the full cost for this proposed customer connection.

   ii) Please describe the details of the contractual commitment that underpins the $28 million in 2013 and the $0.8 million in 2012.

   iii) If this project does not proceed, who will bear the costs incurred to the date of cancellation?

b) For Red Lake Distribution Phase 2 Specified Project:

   i) Please provide a complete description of this project and the full cost for this proposed customer connection.

   ii) Please describe the details of the contractual commitment that underpins the $7.4 million.

   iii) If this project does not proceed, who bears the costs incurred to the date of cancellation?

c) For Lambton Power Plant Specified Project:

   i) Please provide a complete description of this project and the full cost for this proposed customer connection.

   ii) Please indicate where Union will be tying into existing infrastructure and indicate the size of the pipe being proposed for the connection.

   iii) Please provide the details of the services/expenditures that are included in the $1.8 million projected for 2012.

   iv) Please describe the details of the contractual commitment that underpins the $1.8 million referenced above. Please provide a copy of the contract.

v) Please provide the Union open house / public consultation documentation, and any other communications to stakeholders for this proposed project.

vi) If this project does not proceed, who bears the costs incurred to the date of cancellation?

d) Guelph – Combined Heat and Power – OPG Specified Project:

i) Please provide a complete description of this project and the full cost for this proposed new customer connection.

ii) Please describe the details of the contractual commitment that underpins the $1.1 million in 2013. Please provide a copy of the contract.

iii) If this project does not proceed, who bears the costs incurred to the date of cancellation?

e) Sarnia Petrolia Line Specified Project:

i) Please provide a complete description of this project and the full cost for this proposed new customer connection.

ii) Please describe the details of the contractual commitment that underpins the $1.1 million in 2013. Please provide a copy of the contract.

iii) If this project does not proceed, who bears the costs incurred to the date of cancellation?

---

**Response:**

a)

i) In response to a request for natural gas service from Ontario Power Generation ("OPG") for the Thunder Bay Generating Station ("Generating Station"), and to ensure the continued safe operation of the Union Gas Limited ("Union") pipeline system , Union is seeking an Order under Section 90.(1) of the Ontario Energy Board Act for leave to construct approximately 19.0 kilometers of NPS 16 natural gas pipeline and13.0 kilometers of NPS 12 natural gas pipeline in 2013 ("Proposed Facilities") from TransCanada PipeLine's ("TCPL") valve site in Gorham Township in the District of Thunder Bay to the Ontario Power Generation ("OPG") Generating Station on Mission Island in the City of Thunder Bay.

Please see the Thunder Bay leave to construct filing (EB-2012-0226) for the Thunder Bay project budget and other project details and the certificate of public convenience and

necessity filing (EB-2012-0227).

ii) The contractual commitment underpinning the capital expenditures is a Rate 20T distribution contract.

iii) OPG will bear the costs.

b)

i. Please see the response at Exhibit J.B-1-1-1.

ii. Please see the response at Exhibit J.B-1-1-1.

iii. If Phase II does not proceed, Union will be responsible for costs incurred to date.

c)

i) Union has had preliminary discussions with OPG about a potential conversion of Lambton GS to natural gas firing. The Environmental Assessment has not been started. This project will require a timely Ministerial Directive to proceed.

ii) The tie-in location has yet to be determined.

iii) The $1.8 million is made up of costs for an Environmental Assessment, Regulatory costs and Land costs. Union and OPG have executed a Letter of Indemnification whereby OPG will reimburse Union for costs if the project is cancelled. Union has a confidentiality agreement with OPG and will not provide a copy of this letter.

iv) Please see the response at iii) above.

v) Union has not conducted any open house or public consultation since the Environmental Assessment has not begun. Union has communicated with both local elected officials and officials of the local First Nations communities regarding this potential project.

vi) OPG will bear the costs.

d) Please see the response at Exhibit J.B-1-2-3 f).

i. The proposed facilities include 3.6 km of NPS 12 and 2.5 km of NPS 4 high pressure with a total project cost of $4.35 million
ii. Contracted regulations have not been finalized.
iii. Union will bear the costs incurred to date.

e)

i) The 6” high pressure Sarnia Line was installed in 1921 and there have been a number of leaks on this particular system. The project will replace this bare, unprotected NPS 6 steel main (on Petrolia Line between Plank Rd and Oozolfsky St) with 9100 m of NPS 6 steel main. The existing 57 first stage cut services will also be replaced. There are no new customers proposed to be attached to this system – Union Gas is replacing the existing system size for size.

ii) N/A. As described in the above project description, this pipeline is being replaced size for size due to condition. There are no new customers being attached.

iii) This is a replacement of the existing pipeline for integrity reasons and will proceed.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B3, Tab 2, Schedule 4, pg 3

Preamble: Union provides a summary of continuity of Utility Gas Plant Under Construction by Major Project.

For the Nanticoke Major Project listed on line 30:

i) Please provide a complete description of this project and the full cost for this project.

ii) Please indicate where Union will be tying into its existing infrastructure and indicate the size of the pipe being proposed for the project.

iii) Please describe the services/expenditures that are included in the $100,000 projected by the end of 2012.

iv) Please describe the details of the contractual commitment that underpins the $100,000 referenced above. Please provide a copy of the contract.

v) Please provide all open house documentation, and any other stakeholder consultations or media coverage for this proposed project.

vi) If this project does not proceed, who bears the costs incurred to the date of cancellation?

---

**Response:**

i) OPG requested that Union investigate providing gas service to Nanticoke Generating Station. As indicated at Exhibit C1, Tab 2, p. 14, Union is proceeding with the environmental assessment. The costs associated with the facilities to serve Nanticoke Generating Station are not available.

ii) Please see Attachment 1, Attachment 2 and Attachment 3.

iii) The projected spending for 2012 is for the Environmental Assessment.

iv) Union and OPG have executed a Letter of Indemnification whereby OPG will reimburse Union for costs if the project is cancelled. Under the terms of Union's confidentiality agreement with OPG, Union is prohibited from providing the Letter of Indemnification.

v) Please see the response at ii) above.

vi) Please see the response at iv) above.

## Union Gas Limited - Nanticoke Natural Gas Pipeline Project

# Public Information Session

# Welcome

to the

**Nanticoke Natural Gas**

**Pipeline Project**

**Public Information Session**

A Union Gas Pipeline Project

## Union Gas Limited - Nanticoke Natural Gas Pipeline Project

## Public Information Session

# Welcome

Thank you for coming. We invite you to view the display boards, speak to members of Union Gas and/or Stantec Consulting Ltd., and complete a questionnaire providing your questions and comments.

Please sign in at the front desk to have your attendance recorded as part of the environmental study and to receive future Project updates.

# Purpose of the Public Information Session

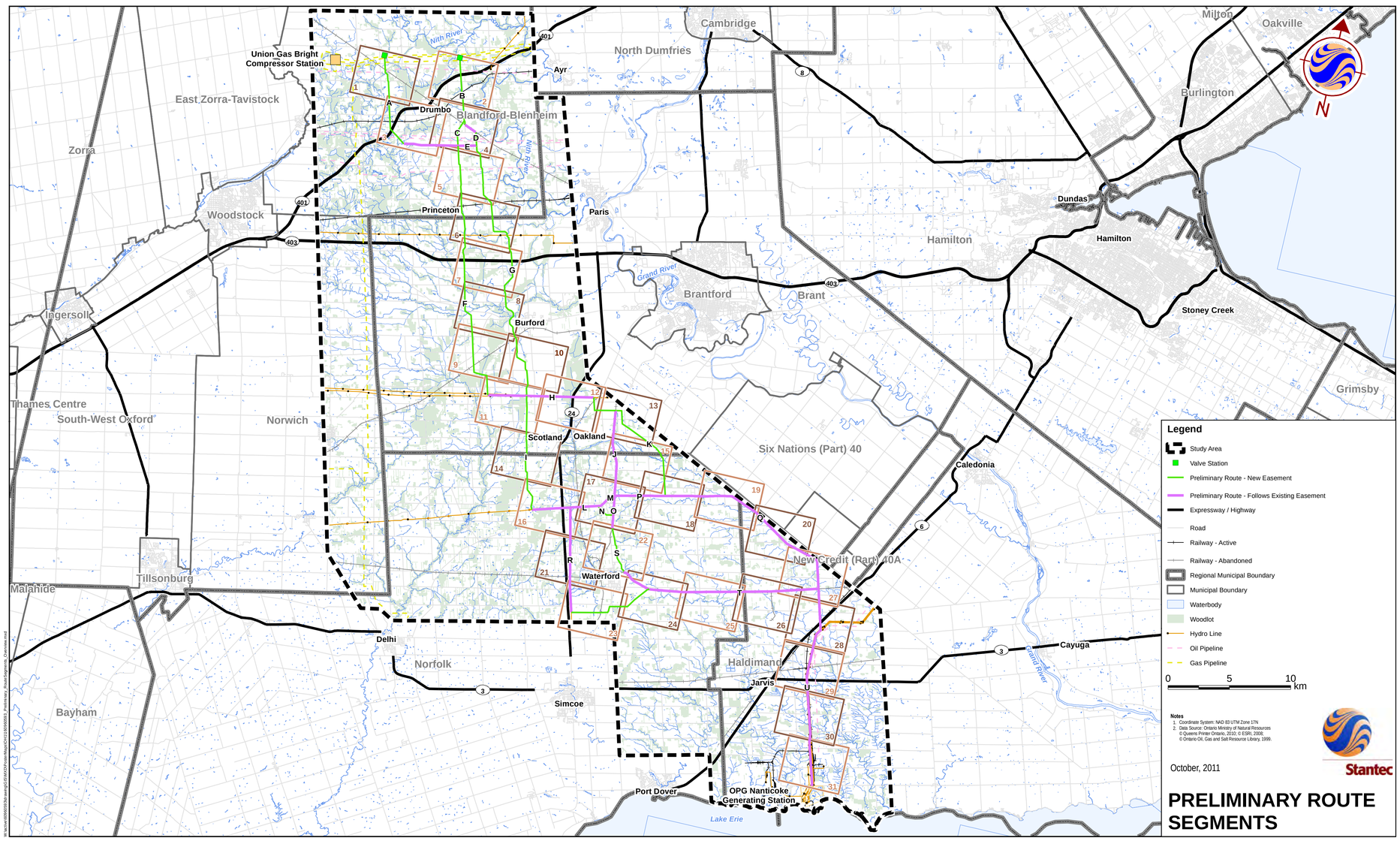
The purpose of this Public Information Session is to:

- Introduce the Project to the community and any interested parties.
- Inform the community regarding the Project and it's details.
- Create an atmosphere that will allow for positive consultation with interested parties in regards to this Project.
- Provide a venue for community feedback, to assist in evaluation of the Project and selection of the pipeline routes.
- Respond to questions from interested parties.

# Project Overview

The proposed Project involves the construction of a 36" diameter natural gas pipeline starting near Union Gas' existing Bright Compressor Station and travelling in a south easterly direction where it will connect to and service the Nanticoke Generating Station. The length of the proposed natural gas pipeline will be between 80 to 95 kilometres, depending upon the final Preferred Route.

The pipeline will be constructed within new easements and will parallel existing infrastructure, such as hydro lines, where feasible.



# Project Context

The Ontario Government has committed to eliminating coal-fired generation from Ontario's electricity supply mix by the end of 2014. To meet this goal, the Provincial Government's Long Term Energy Plan recognizes the potential for future conversion of the Nanticoke Generating Station to utilize natural gas.

Upon directive by Ontario Power Generation, Union Gas will build and operate the Project to bring natural gas to the Nanticoke Generating Station. As part of the planning for the potential conversion, Union Gas has commissioned Stantec Consulting Ltd. to undertake an environmental study of the construction and operation of the natural gas pipeline.

# Environmental Study

The environmental study and subsequent Environmental Report for the Project will be completed as per the Ontario Energy Board's (OEB) **"Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)"**.

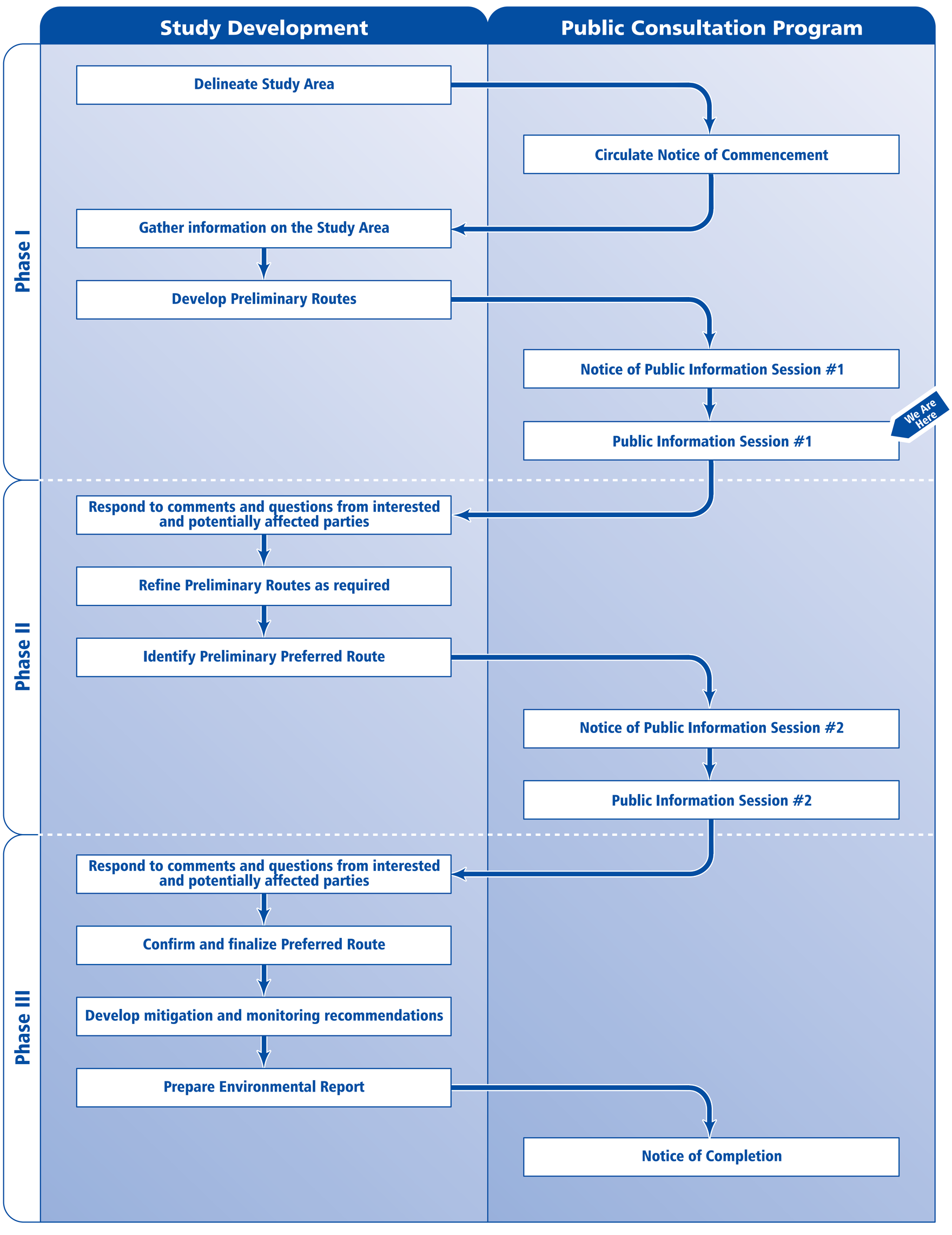
The study will:

- Be conducted during the earliest phase of the Project
- Identify potential impacts of the construction and operation of the proposed pipeline in regards to environmental and socio-economic conditions
- Identify an environmentally acceptable route for the proposed pipeline
- Undertake consultation to understand the views of interested and potentially affected parties
- Assess the potential cumulative effects of the Project in conjunction with other projects that are planned for the area
- Develop mitigation and protective measures to avoid or minimize impacts
- Develop an appropriate inspection, monitoring and follow-up program for the Project, to ensure the success of mitigation and protective measures

Union Gas Limited - Nanticoke Natural Gas Pipeline Project

Public Information Session

# Environmental Study Process



# The Route Selection Process

The Preferred Route for the proposed pipeline will be selected through a five-step process:

## Step 1

**Constraints and Opportunities**
Inventory of environmental and socio-economic features.

## Step 2

**Generate Preliminary Routes**
The generation of Preliminary Routes is influenced by the following:

- Avoidance to the extent feasible of sensitive socio-economic and environmental features such as communities, wetlands, etc.
- Avoidance to the extent feasible of areas which may present construction difficulties or the potential for long-term maintenance/remedial work.
- Utilizing to the extent feasible existing linear infrastructure, such as electrical transmission lines, pipelines and rail lines.
- The length of the pipeline and associated costs of construction and operation may influence route generation.
- Routes should follow a reasonably direct path between start and end points.

## Step 3

**Route Evaluation**
An evaluation of the Preliminary Routes will be conducted based on:

1. A quantitative comparative evaluation of impacts to environmental and socio-economic features.
2. A qualitative comparative evaluation based on stakeholder input and the experience of the Project Team in routing linear infrastructure.

Once complete, a Preliminary Preferred Route will be identified.

## Step 4

**Input on the Preliminary Preferred Route**
The Preliminary Preferred Route is subject to input through a variety of communication and consultation activities, such as Public Information Sessions.

## Step 5

**Confirmation of the Preferred Route**
A Preferred Route will be confirmed. The Preferred Route may require micro-sitting as the project moves forward based on the results of pre-construction field investigations, landowner requests, and/or engineering considerations.

# Existing Features

Data on existing features for the Study Area has been collected from a number of external sources including but not limited to agencies, aerial photography, official plan mapping and natural features mapping. This information has been used to evaluate potential Pipeline Routes and to generate Preliminary Routes.

Additional data collection and agency consultation will continue after this Public Information Session to evaluate the Preliminary Routes and to assist in the selection of a Preferred Route.

Environmental and socio-economic features within the Study Area, relevant to pipeline planning, construction and operation, have been outlined in the following maps. The Preliminary Routes avoid sensitive environmental and socio-economic features where feasible. Where features cannot be avoided, mitigation and protection measures will be employed during pipeline construction and operation.

# Natural Gas

Natural gas is an environmentally preferred fuel which can power electricity generation plants that provide much needed electricity to Ontario.

Natural gas produces significantly fewer greenhouse gas emissions (45% less $CO^2$) than coal-fired generation plants.

Natural gas is a reliable compliment to the intermittent nature of renewable energy such as wind and solar. It is always available when you need it.

Natural gas is a domestic source of energy that can help reduce reliance on imported foreign fuels, and can create local jobs.

Domestic supply is abundant and able to meet our energy demand for decades to come.

# Natural Gas Safety

Union Gas is an experienced pipeline operator, delivering natural gas to customers around the province through more than 60,000km of operational pipelines.

Union Gas serves the majority of all gas-fired electricity generation in Ontario, including communities like Windsor, Sarnia and Halton Hills. This history provides significant experience in safe and reliable pipeline construction and operation.

Union Gas pipelines and facilities are designed, constructed and maintained to meet or exceed the stringent codes and requirements of:

- Ontario Energy Board Act
- Canadian Standards Association
- Technical Standards and Safety Authority

Pipelines used to transport natural gas are monitored 24 hours a day. Operators can shut off valves located at regular intervals along the pipeline, as well as stop the flow of gas altogether.

# Environment

In an effort to protect the natural environment, Union Gas will conduct environmental planning and/or monitoring:

- Pre-construction
- During construction
- Post-construction

## Pre-Construction

- An environmental study is being undertaken to assess potential environmental and socio-economic impacts.
- The study will identify the need for field investigations (e.g., species at risk, etc.).

## Construction

- An on-site Environmental Inspector will be responsible for ensuring construction activities are conducted in compliance with environmental commitments (e.g., environmental regulatory permits, etc.).
- The Environmental Inspector will be retained from a third-party consultant.

## Post-Construction

- A monitoring program will follow construction during the first and/or second complete growing season.
- The objective - to ensure that mitigation and protective measures are successful and continue to be effective.

# Construction

Union Gas is committed to minimizing the effects of our projects and operations on the environment. Our environmental management practices help to avoid, mitigate and/or compensate for impacts to environmental and socio-economic features related to our pipeline projects. Such practices relevant to the current Project include:

- Pre-construction environmental planning to avoid, to the extent possible, impacts to environment and socio-economic features;
- Environmental management practices to address potential impacts to geophysical features, soil, vegetation, water, wildlife, air quality, noise and socio-economic features;
- Contingency plans in the unlikely event of spills, fires, extreme weather conditions, and the discovery of previously unknown heritage resources and/or contaminated soils; and
- Post construction monitoring and follow-up.

# Construction

Construction activities include clearing, grading, stringing of pipe, trenching, welding, backfill, tile repair and clean-up.

The proposed construction is scheduled to take advantage of the drier summer months thereby minimizing the impact of construction activity on agricultural lands and other features such as watercourses.

Union Gas' construction procedures incorporate proven methods of minimizing impacts to lands. An example of this is Union Gas' Wet Soil Shutdown practice that has been implemented for over 25 years to protect agricultural land, and Union Gas' practice of stripping topsoil prior to construction activities on agricultural land.

Union Gas will construct the proposed pipeline in compliance with its current construction procedures, environmental construction plan, permit conditions and commitments to regulators and landowners.

# Ontario Energy Board Review and Approval Process

The Ontario Energy Board (OEB) is the body that regulates the natural gas industry in Ontario, in the public's interest. The OEB's approval is required before this pipeline can be constructed.

Union Gas plans to submit our application for this project to the OEB in the spring of 2012. This application will include comprehensive information on the project including: the need for the project, facility alternatives, project costs and economics, pipeline design, pipeline construction, environmental mitigation measures, land requirements, and First Nations consultation.

The OEB will then hold a public hearing to review the project. This will include notices in local newspapers, letters to directly affected landowners, the opportunity for the general public and landowners to ask questions and submit questions regarding the project, a formal hearing, and a written decision regarding the project.

If after this review the OEB finds the project is in the public interest it will approve construction of the pipeline. If the project is approved the OEB normally attaches conditions to the approval which Union Gas will comply with during the construction and restoration process.

Additional information about the OEB process and information about how to participate in the OEB hearing process can be found http://www.ontarioenergyboard.ca

Submit application > Public hearing > Approval > Construction

# Consultation

Union Gas is committed to creating opportunities for meaningful input on this Project from all interested and potentially affected parties through:

- Public Information Sessions
- Publishing updates in local newspapers
- Providing a toll free phone number (1-855-802-6353)

A key element of this Project will be consultation and engagement with:

- Municipal Staff and Elected Officials
- Landowners
- First Nations
- The Métis Nation of Ontario
- Government Agencies
- Special Interest Groups
- Members of the Community

Consultation is instrumental in the following ways:

- The evaluation of the pipeline route alternatives;
- The selection of the preferred pipeline route; and,
- Identification of the various mitigation and protective measures that will be employed to minimize the effects of the construction and operation of the proposed pipeline project.

If you wish to discuss the Project privately, please speak to a Project Team member, who can make appropriate arrangements.

***Please fill out the exit questionnaire before you leave.***

# Landowner Relations

Union Gas is committed to seeking mutually acceptable agreements with landowners. For the construction of this Project, Union Gas will be seeking land purchases and permanent easements, plus a number of temporary easements for construction working areas and topsoil storage.

Once a preferred route is determined, and we have confirmation from Ontario Power Generation to proceed with this Project, Union Gas will begin discussions with individual landowners and if appropriate, enter into Option Agreements with individual landowners for all required land rights. At such time, we will offer a form of Easement which has been previously approved by the OEB, along with a standard compensation package.

The specific location and area of the various station sites (i.e. land purchases), permanent easements and temporary easements will be finalized after the Ontario Energy Board (OEB) approves the Project and issues a "Leave to Construct" order.

Union Gas is willing to engage in discussions/negotiations with landowner negotiation committees at a point when all approvals have been obtained for the Project.

During construction, Union Gas will have a Lands Relations Agent available to keep landowners informed about the Project and to answer questions or concerns.

# Project Schedule

## Project Timeline

**2011**

- Delineate Study Area
- Circulate Notice of Commencement
- Gather Information on the Study Area
- Develop Preliminary Routes

**We Are Here**

- Public Information Session #1
- Respond to comments and questions from interested and potentially affected parties
- Refine Preliminary Routes, as required
- Evaluate Preliminary Routes
- Identify Preliminary Preferred Route

**2012**

- Public Information Session #2
- Respond to comments and questions from interested and potentially affected parties
- Confirm and finalize the Preferred Route
- Prepare Environmental Report
- Complete OEB filing
- Obtain necessary land rights

**2013/ 2014** (If the OEB approves the application)

- Pre-construction activitites
- Construction
- Pipeline in service

Ongoing consultation with municipal staff, elected officials, landowners, First Nations, the Métis Nation of Ontario, government agencies, special interest groups and members of the Community.

# Next Steps

After this Public Information Session, the following will be carried out:

1. Respond to comments/questions received.
2. Confirm study findings to-date based on comments received.
3. Continue data collection and route assessment.
4. Analyze the Preliminary Routes and select a Preliminary Preferred Route.
5. Prepare for the next Public Information Session (expected Winter 2012).

# Thank You!

On behalf of the Project Team, thank you for attending this Public Information Session. We appreciate your involvement in the consultation process and we would like to hear from you. Please fill out the Exit Questionnaire. Include your name and contact information so that a Project Team member can respond to your inquiry.

If you have any further comments or questions please contact us toll free at 1-855-802-6353.

**Nanticoke Generating Station Pipeline Project External Communications**

| | |
|---|---|
| Wk of Jan 25 | Meeting with Six Nations of the Grand River, Mississaugas of the New Credit and the Métis Nation of Ontario to discuss proposed project and to gather feedback on potential corridor options |
| Wk May 1/8 | Letters to Mayors and Council, MPP's and MP's for municipalities in study area (Oxford County, Township of Blandford-Blenheim, Township of Norwich, Brant County, Norfolk County, Haldimand County), introducing project, commencement and corridor selection (copy below) |
| Wk May 1/8 | Public notice of project commencement (local newspapers, copy below) |
| Wk May 1/8 | Environmental assessment letter to First Nations and Agencies |
| Wk Oct 10 | Letters to Mayors and Council, MPP's and MP's for municipalities in study area, updating project status, advising of upcoming public information sessions (copy below) |
| Wk Oct 10 | Public notice of Public Information Sessions (local newspapers - copy below) |
| Wk Oct 10 | Letters providing notice of upcoming Public Information Session sent to landowners, First Nations, Agencies etc, in study area. |
| Wk Oct 24 | Public information sessions in Drumbo, Burford and Jarvis |
| Wk. Jan 30 | Letters to attendees of Public Information Sessions with responses to comments |
| March 8 | Community Information Session - Six Nations and Mississaugas of New Credit |

**Letter to MP's MPP's and Mayors in study area introducing project:**

May, 2011

Dear Mayor and Council:

I would like to update you on an important project that will help provide Ontario with a clean, reliable source of electricity.

As you are aware, the Provincial Government's Long-Term Energy Plan recognizes the potential conversion of the Nanticoke Generating Station to natural gas. The Plan also notes the potential for co-firing biomass in any converted generating units. This is good news for the environment. Natural gas is a clean alternative to coal with significantly fewer emissions. If the plant is converted, it is also good news for the local economy that the plant will remain open, that construction activities associated with the conversion will provide local jobs and the use of biomass remains a possibility.

At the request of Ontario Power Generation, Union Gas is working on preliminary plans to bring natural gas service to the Nanticoke Generating Station.

A key element of this project will be an environmental assessment conducted by an independent third party, which will include consultation with First Nations, the Métis Nation, municipalities, landowners, government agencies and other local stakeholders and is instrumental in the evaluation of various route alternatives for the pipeline and ultimately in the selection of the final preferred route. The route for this pipeline has not yet been chosen, however the proposed study area for the environmental assessment is outlined in the attached map.

Public Information Sessions are planned for mid-2011. These sessions will give interested individuals an opportunity to provide comments or ask questions regarding the proposed pipeline, the route selection process, construction procedures and mitigation measures. To ensure the public is aware of the session, we will advertise it in local newspapers and send letters to those living along the proposed route. Anyone who might be unable to attend the Open House may call or send letters to our representatives at any time.

The complete environmental assessment will be included in an application to the Ontario Energy Board (OEB) in 2012. The OEB's review and approval is required before this project can proceed. If approved and direction is received from the provincial government to convert the Nanticoke plant, construction could begin in the spring of 2014.

Union Gas's experienced pipeline contractors will use as many local resources as practical to build the pipeline and where possible will procure materials from the local community. The local community will receive further benefit from the incremental property taxes Union Gas will pay annually to the local municipalities on this new pipeline.

Union Gas is an experienced pipeline operator with an enviable safety and reliability record that spans 100 years. This history has provided us with significant experience in pipeline construction and operation and we will be applying that experience to this project.

We have appreciated our long and close relationship with the (Regional Municipality of Haldimand/Norfolk etc.) and I hope the above information is helpful. Should you or your staff have any questions, please do not hesitate to contact me.

Sincerely,

Murray Costello
District Manager, Waterloo/Brantford

**Newspaper notice introducing project:**

## UNION GAS LIMITED - PROPOSED NANTICOKE PIPELINE
## Initiation of Environmental Assessment Study

The Ontario Government has committed to eliminating coal-fired generation from Ontario's electricity supply mix by the end of 2014. To meet this goal, the Provincial Government's Long Term Energy Plan recognizes the potential for future conversion of the Nanticoke Generating Station to utilize natural gas.

As part of the planning for the conversion, Union Gas Limited has commissioned Stantec Consulting Ltd. to undertake an environmental assessment (EA) study of the construction and operation of a natural gas pipeline from a point at or near Union Gas's existing Bright Compressor Station to the Nanticoke Generating Station.

The EA will fulfill the requirements of the Ontario Energy Board's (OEB) "Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)". The EA process will include consultation with various stakeholders including landowners, First Nations, the Métis Nation, government agencies and other local stakeholders. Consultation will be instrumental in various aspects of the EA including the evaluation of various pipeline route alternatives; the selection of the preferred pipeline route; and the various mitigation measures employed to minimize the effects of constructing and operating the proposed pipeline.


It is anticipated that the EA will be completed in early 2012 at which time Union Gas will file an application for the proposed pipeline to the OEB. The OEB's review and approval is required before the proposed natural gas pipeline project can proceed. If approved, and direction is received from the Provincial Government to convert the Nanticoke plant to natural gas, construction of the pipeline could begin in the spring of 2014.

Public Information Sessions are planned in mid-2011. Notices of the sessions will be placed in local newspapers.

For questions regarding the EA study process or this project, please contact Stantec Consulting Ltd. at **1 866-842-7559**.

uniongas

**Letter to MP's MPP's and Mayors in study area updating project and advising of upcoming Public Information Sessions:**

October 11, 2011

Dear Mayor and Council:

I would like to update you on an important project that will help provide Ontario with a clean, reliable source of electricity.

As you are aware, the Provincial Government's Long-Term Energy Plan recognizes the potential conversion of the Nanticoke Generating Station to natural gas. At the request of Ontario Power Generation, Union Gas is continuing work on preliminary plans to bring natural gas service to the Nanticoke Generating Station.

Union Gas is committed to minimizing the effects of our projects and operations on the environment and a key element of this project will be an environmental assessment conducted by an independent environmental consultant, Stantec, which will include consultation with First Nations, the Métis Nation, municipalities, landowners, government agencies and other local stakeholders -- and is instrumental in the evaluation of various route alternatives for the pipeline and ultimately in the selection of the final preferred route. Stantec has identified several alternative routes for the pipeline which are illustrated on the adjacent map.

Three public information sessions regarding the proposed pipeline are planned to allow interested individuals to provide comments or ask questions regarding the project, the route selection process, construction procedures and specific mitigation measures:

1. October 25, Drumbo Agricultural Hall, 42 Centre Street, 4-8 pm
2. October26, Burford Community Centre, 14 Potter Drive, 4-8 pm
3. October 27, Jarvis Community Centre, 18 James Street, 4-8 pm

To ensure the public is aware of the sessions, they will be advertised in local newspapers and we will send letters to those living along the alternative routes. Anyone who might be unable to attend an information session may call or send letters to our representatives at any time.

The complete environmental assessment, which will discuss the pipeline project only, will be included in an application to the Ontario Energy Board (OEB) in 2012. The OEB's review and approval is required before this project can proceed. If approved, and direction is received from the provincial government to convert the Nanticoke plant, construction could begin in the spring of 2014.

Union Gas has been delivering natural gas to residential, commercial, institutional and industrial users throughout the province for 100 years, with over 65,000 km of pipelines in operation. This history has provided us with significant experience in pipeline construction and operation. We have an enviable safety and reliability record in this regard and we will be applying that experience to this project.

We have appreciated our long and close relationship with the (Regional Municipality of Haldimand/Norfolk etc.) and I hope the above information is helpful. Should you or your staff have any questions, please do not hesitate to contact me.

Sincerely,

Murray Costello
District Manager, Waterloo/Brantford

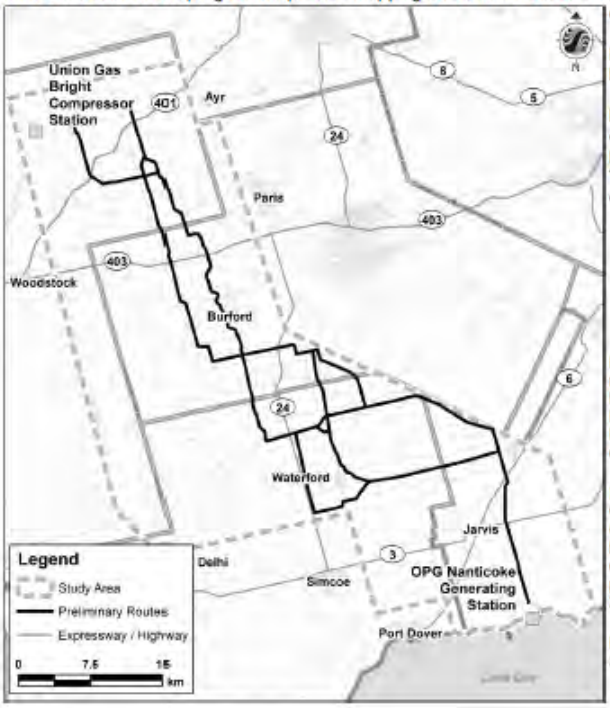
**Newspaper notice advising of upcoming Public Information Sessions:**

## NOTICE OF PUBLIC INFORMATION SESSION
## Union Gas Limited - Nanticoke Natural Gas Pipeline

The Ontario Government has committed to eliminating coal-fired generation from Ontario's electricity supply mix by the end of 2014. To meet this goal, the Provincial Government's Long Term Energy Plan recognizes the potential for the future conversion of the Nanticoke Generating Station to utilize natural gas. As part of the planning for the conversion, Union Gas Limited has commissioned Stantec Consulting Ltd. to undertake an environmental study of the construction and operation of a natural gas pipeline from a point at or near Union Gas's existing Bright Compressor Station to the Nanticoke Generating Station.

As part of the study process, several possible Preliminary Routes for the proposed natural gas pipeline have been identified. The Preliminary Routes will be evaluated in order to help identify a Preliminary Preferred Route. The Preliminary Routes follow existing linear infrastructure where feasible, such as electricity transmission lines. Where required, Preliminary Routes cross private property.

Maps of the Preliminary Routes are available at the following locations: Blandford-Blenheim Township Office 47 Wilmot Street, Drumbo; Norwich Public Library 10 Tidy Street; Burford Public Library 24 Park Avenue; Waterford Public Library 15 Main Street South; Jarvis Public Library 2 Monson Street. In addition, the public can access the route mapping online at the following link: maps.NanticokeNaturalGasPipeline.ca. This link allows the user to enter a home address and the program will provide mapping and a linear distance of the property to the nearest Preliminary Route. The link also allows the user to download maps of the Preliminary Routes.




Public Information Sessions regarding the Project and Preliminary Routes will be held as follows:

**Drumbo Agricultural Hall**
**42 Centre Street**
**Drumbo, ON**
**Tuesday October 25th, 2011**
**4:00 p.m. to 8:00 p.m.**

**Burford Community Centre**
**14 Potter Drive**
**Burford, ON**
**Wednesday October 26th, 2011**
**4:00 p.m. to 8:00 p.m.**

**Jarvis Community Centre**
**18 James Street**
**Jarvis, ON**
**Thursday October 27th, 2011**
**4:00 p.m. to 8:00 p.m.**

Public Information Sessions will be conducted as drop-in centres, and representatives from both Union Gas and Stantec will be available to discuss the Project and respond to questions or comments. Comments received at the Public Information Session will be instrumental in the evaluation of various Preliminary Routes for the pipeline. Comments will also be used to help develop site-specific protection and mitigation measures.

It is anticipated that an Environmental Report will be completed in early 2012 at which time Union Gas will file an application for the proposed pipeline to the Ontario Energy Board (OEB). The OEB's review and approval is required before the proposed natural gas pipeline project can proceed. If approved, and direction is received from the Provincial Government to convert the Nanticoke plant to natural gas, construction of the pipeline could begin in the spring of 2014.

For questions regarding the study process or this Project, please contact Stantec Consulting Ltd. at **1 855-802-6353**.

uniongas

# Media Nanticoke Generating Station Pipeline Project:

# Gas pipeline still long way off ; NANTICOKE STATION

Simcoe Reformer
Fri Mar 16 2012
Page: 1
Section: News
Byline: DANIEL R. PEARCE, SIMCOE REFORMER

Plans to bring a natural gas pipeline to the **Nanticoke** coal-fired generating station -- a move that could save it from closure -- are moving forward under a cloud of uncertainty.

**Nanticoke** is scheduled to be shut down sometime within the next two years as the Ontario government phases out coal in favour of cleaner energy.

But Queen's Park has also suggested it might keep the plant open by switching it to more acceptable fuels such as natural gas or biomass or a mixture of the two.

A decision is supposed to be coming sometime this year.

The catch is **Nanticoke** is unlikely to stay open without a pipeline feeding it gas, but the pipeline can't be built until the province gives the OK for the conversion.

"There's no guarantee at this point the project will happen," said Dave Dent, manager of strategic power for **Union Gas**, which will unveil a "preliminary" route for its pipeline sometime this spring. "The government has not committed to it yet.

"If the government doesn't direct (Ontario Power Generation) to convert **Nanticoke** to natural gas, there's no need for the pipeline to be built."

If the go-ahead is given, the pipeline still faces a number of potential hurdles.

The project would see the ground dug up between Bright, Ont., near Highway 401 (where a major gas transmission line exists) all the way to **Nanticoke** and a 36-inch diameter pipeline buried in the ground. It would pass under farmland, forest, and streams.

A proposed route, which will almost certainly go through part of Norfolk County, will be posted later this spring and the public allowed to give feedback.

A final decision rests with the Ontario Energy Board, Dent said.

Many landowners want the pipeline to come through their property so they can benefit financially from payments they would receive.

Others don't want it at all, while those concerned about the environment might also object.

Last fall, **Union Gas** held a series of open houses in the Brant, Haldimand and Norfolk area after posting a number of possible routes.

"We had a number of folk express a variety of views," Dent said. "Some prefer to have it. Others are concerned it could disturb wetlands."

After a final route is decided on, another series of open houses will be held, at which time landowners directly affected will have their say.

"That will be the beginning of the discussion," he said, adding negotiations with willing landowners would follow.

But will there be a functioning generating station for a pipeline to go to?

During his annual state of the county address this month, Norfolk Mayor Dennis Travale said he is anticipating the news about **Nanticoke** won't be good, but

declined to elaborate further on what he knows.

In an interview, Jennifer Kett, spokesperson for Ontario's Minister of Energy, Chris Bentley, said conversion from coal to natural gas at plants at **Nanticoke** and Lambton, near Sarnia, "is something we are looking at very closely.

"Hopefully later this year, we will make an announcement about the conversion of some of the units at **Nanticoke** and Lambton to natural gas," she said.

The **Nanticoke** plant sits in Haldimand County, which stands to lose millions in property taxes if the station is idled.

Norfolk and Haldimand counties also face an economic hit in the event of closure due to the loss of hundreds of OPG employees who work at **Nanticoke** and live in both communities.

Daniel R. Pearce 519-426-3528 ext. 132 daniel.pearce@sunmedia.ca twitter.com/danreformer



# New life sought for old coal plant; Future of Nanticoke power plant unclear with conversion to gas very costly

Toronto Star
Tue Dec 27 2011
Page: B1
Section: Business
Byline: John Spears Toronto Star

Two things are certain about Ontario Power Generation's coal-fired power station at **Nanticoke**: it's huge and it will stop burning coal by the end of 2014.

But not much else is clear about the future of the 2,760-megawatt plant on the north shore of Lake Erie.

OPG would like to convert the station to burning natural gas, says chief executive Tom Mitchell. But that proposal is tied up in a potent mixture of election politics, environmental health and competing projects.

**Nanticoke**'s future is one of the biggest questions still unanswered following the Liberal government's decision to stop burning coal at its four coal-fired power plants as of 2014.

But if the plants don't burn coal, what happens to them?

The future of the two smallest coal-burning plants is clear. The Atikokan plant in northwestern Ontario will be converted to burn bio-mass, such as waste from the forest industry.

And the coal-burning plant in Thunder Bay has the go-ahead to convert to burning natural gas.

That leaves the Lambton plant, near Sarnia, and **Nanticoke**.

Mitchell's preference is clear.

"Our coal facilities still have a useful economic life," he told the Star. "We've been entrusted by the people of Ontario to make sure these assets are best utilized.

"We've looked at the ability to convert Lambton and **Nanticoke** to natural gas. It is possible. If the system planners believe that is an option they would like us to pursue, we have the capability of doing that."

OPG hasn't said how many of **Nanticoke**'s six operating units would be converted to burn gas. (Two units have already been retired, with two more winding down by year-end.)

The Lambton plant might be a natural; it is easily served by a nearby gas pipeline.

**Nanticoke** is not. It would have to be served by a 47-kilometre line, as yet unbuilt. Work is already underway on the environmental assessment for the line, which would be built by **Union Gas**.

Converting **Nanticoke** to gas has the strong backing of Ken Hewitt, the mayor of Haldimand County.

"There's a lot at stake," says Hewitt, who says the **Nanticoke** plant pays 6.5 per cent of all the property taxes in the county. If it ceases to operate, the tax take will shrivel.

For Haldimand County, to lose **Nanticoke** would be like Oshawa losing General Motors, he said.

OPG isn't the only player in Haldimand.

A private firm, Competitive Power Ventures (CPV), has also floated a proposal for a gas-fired plant in the county.

CPV's Stephen Somerville says it could work in either of two ways. The company could build a 400-megawatt plant at a cost of something over $300 million, to be used for short bursts during periods of peak demand.

Or it could build two plants of 600 megawatts each. They would use gas turbines as the primary power source, then capture the heat from the exhaust, turn it into steam and run a second generator.

It's a more expensive proposal, calling for an investment of more than $1 billion.

Somerville doesn't view CPV's proposal as necessarily being in competition with OPG. Ideally, there would be room for both.

And he points out that the high-capacity transmission lines serving the **Nanticoke** plant could easily transport the power from both projects to market.

In theory, the decision to go ahead with either OPG's proposal or CPV's, or both, rests with the Ontario Power Authority.

But the business of gas-fired generation has become enmeshed with politics, as the Liberal government has freely meddled with the power planning that's supposed to be the job of the power authority.

Leading up to last October's election, the Liberals killed two proposed gas-fired plants that had drawn strong local opposition - one in Oakville, one in Mississauga.

The cancellations were transparently political: the Liberals were desperately trying to save the seats of Liberal MPPs in both communities. And they did.

But it leaves the proponents of both those plants looking for compensation or alternative projects.

At the same time, the Independent Electricity System Operator has warned that the supply of power in the southwestern GTA, where both plants were to be built, is stretched thin and "a long-term solution will be required" to accommodate growth in the region.

The combination of power needs, economics and public acceptance of generating plants will all come into the mix as power planners make decisions in coming months, with politicians looking over their shoulders.



# Pipeline proposed in Haldimand County

Sachem and Glanbrook Gazette
Wed Nov 23 2011
Page: 1
Section: News
Byline: Natalie Clewley

A natural gas pipeline supplied by **Union Gas** Limited may be coming to Haldimand County in the spring of 2014.

**Union Gas** Limited is currently working on the preliminary plans to bring the natural gas pipeline to the **Nanticoke** Generating Station from **Union Gas**'s existing Compressor Station in Bright Ontario. The proposed project involves the construction of a 36 inch diameter natural gas pipeline that will be between 80 to 95 kilometers.

The project is being created to support the Provincial Government's Long-Term Energy Plan to convert the **Nanticoke** Generating Station from coal-fired generation to natural gas according to Andrea Stass, manager of external communications and media relations for **Union Gas** Limited.

Currently Ontario Power Generation (OPG) has not received direction from the provincial government to convert the **Nanticoke** plant. If the **Nanticoke** plant is not converted from coal-fired generation to natural gas by 2014 approximately 600 jobs will be lost in Haldimand County.

As part of the environmental assessment process, a public information session was held at the Jarvis Community Centre on October 27. Approximately 300 residents attended.

If direction is received from the Provincial government to convert the plant, and the Ontario Energy Board approves the pipeline project, construction could begin in the spring of 2014.

For further information, contact **Union Gas** Limited at 1-855-802-6353.



## Pipeline public meeting coming to Brant ; BRANT COUNTY

The Brantford Expositor
Fri Oct 21 2011
Page: A5
Section: News
Byline: MICHAEL-ALLAN MARION
Column: County Lines

**Union Gas** will hold three public information meetings in the area during the next week to explain its bid to build a pipeline to bring natural gas to the **Nanticoke** Generating Station.

Residents can view the company's plans at the following three meetings:

-Tuesday, from 4 p.m. to 8 p.m. in the Drumbo Agricultural Hall at 42 Centre St. in Drumbo;

-Wednesday, from 4 p.m. to 8 p.m., in the Burford Community Centre at 14 Potter Dr.;

-Thursday, from 4 p.m. to 8 p.m. in the Jarvis Community Centre at 18 James St.

Environmental consultant Stantec will explain at each session **Union Gas**'s plans to minimize the effects of the pipeline construction and operation on the environment, and seek public feedback. It is part of an environmental assessment process the company must undergo to build the pipeline.

The meetings and more details have been posted on the websites and council agendas of Brant County, Norfolk County and Waterloo Region. Each municipality also will forward comment reports on the project.

The project is part of the Ontario government's plan to convert the **Nanticoke** station from coal-fired generation to natural gas and other cleaner fuel sources.

The environmental assessment will be used in an application in 2012 to the Ontario Energy Board for approval to build the pipeline.

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## County hopeful for plant's future

The Dunnville Chronicle
Wed Oct 12 2011
Page: A5
Section: News
Byline: DANIEL PEARCE, QMI AGENCY

Haldimand Mayor Ken Hewitt says newfangled forms of clean energy have joined natural gas as a potential saviour for the coalfi red station at **Nanticoke**, which is slated to close in 2014.

Gas and biomass have dominated discussions on how to keep the station, with its hundreds of jobs, open. The government's long-term energy plan refers to the possibility of a gas conversion at **Nanticoke**.

But provincial politicians and bureaucrats spoken to by county officials "over the past few months" indicate they now "see **Nanticoke** as a viable option for alternative energies," Hewitt said in an interview.

A number of new ways of producing electricity cleanly are still in the development stage but hold promise for the lakeside plant, he said. They include photosynthesis, a process in which algae is artifi- cially grown and the energy from it removed.

"Gas is the flavour of today," Hewitt said. "Is it tomorrow? Maybe not."

The county has been lobbying the province to use an alternative fuel at **Nanticoke** since Queen's Park announced years ago it planned to phase out coal production in Ontario.

Half of **Nanticoke**'s eight units are now down and the other half are scheduled to be shut in the next three years.

Keeping the plant operating, Hewitt said, is important to the whole province, not just Haldimand and its surrounding counties.

If it closes, a valuable transmission corridor will sit unused while new forms of generation will likely be needed when some of Ontario's nuclear facilities go offline in the future for repairs, he noted.

"We are not just hosts. We are partners in this game," Hewitt said.

"I am hopeful that if we continue to drive home the message we will see results that positively impact this area."

**Union Gas** is looking into the possibility of bringing a pipeline into Haldimand up to the plant, "but I don't where that's at," Hewitt noted.

An American company, Competitive Power Ventures, in the meantime has tabled plans to build a gas-fired plant in the county and would make use of the pipeline.

The Ontario Power Authority, however, has said it will allow only one of either **Nanticoke** or the private company to use the pipeline -not both.

If **Nanticoke** can be fuelled with something other than gas, that would leave the private project open to tap into the pipeline, giving the county two sources of electrical generation, Hewitt noted.

Ted Gruetzner, spokesperson for Ontario Power Generation, which operates **Nanticoke**, said that while the government's long-term plan calls for a gas conversion at **Nanticoke**, "no decision has been made on that."

Illustration:
• Photo supplied by Ontario Power Generation
• Haldimand Mayor Ken Hewitt says newfangled forms of clean energy have joined natural gas as a potential saviour for the Ontario Power Generation coal-fired station at **Nanticoke**, seen here, which is slated to close in 2014.

# Nanticoke's future remains uncertain ; ENERGY: Will generating station switch from coal to natural gas?

Simcoe Reformer
Tue Nov 30 2010
Page: 1
Section: News
Byline: DANIEL PEARCE TIMES-REFORMER

Two of the remaining six units at the **Nanticoke** coal-fired plant will close by the end of next year, the province announced last week in a long-range planning report on power generation.

The announcement comes on the heels of the closure of two units at the lakeside plant just last month. The latest move would reduce the facility to one-half its original capacity while shrinking its workforce further from its peak of about 600.

The report, however, also contained some good news for **Nanticoke**, which is slated to be shut down completely by 2014 as part of Ontario's policy of ridding itself of all coal-generated electricity. It also gave the go-ahead for Ontario Power Generation to continue with plans to convert the station to natural gas -- although it fell short of a firm commitment to keeping **Nanticoke** open.

"The government indicated we should look for a pipeline route in to **Nanticoke** in short order," said OPG spokesperson Bob Osborne.

"There's no commitment to do it, but the plan recognizes there may be some value to it."

Rick Prudil of the Power Workers Union called the report "a step in the right direction, but it's only a step."

Prudil said the union would like to see the government quickly commit to converting **Nanticoke** to a combination of natural gas and biomass.

With the 2014 deadline looming, and time-consuming planning and construction needed to bring in a pipeline, Prudil said the union fears the worst.

"At some point we're afraid time will run out and a decision will be made in haste to replace **Nanticoke** with a station elsewhere," said Prudil, an employee at the plant.

A hybrid plant is preferable because it would preserve more jobs and release fewer greenhouse gases than a pure gas plant would, he explained.

He estimated a pure natural gas plant would employ between 160 and 300 people depending on how many of **Nanticoke**'s units were used.

A six-unit hybrid plant, Prudil said, would need about 450-500 people, roughly the number of people working at **Nanticoke** now.

Osborne said OPG will hold "discussions" with **Union Gas** over the pipeline and will "continue to do our own engineering work to convert the plant."

Queen's Park has already directed OPG to switch two other coal plants in Northern Ontario to alternative fuels. Atikokan will burn wood-based biomass while Thunder Bay will use natural gas.

The report hinted at a similar fate for the province's two other remaining coal plants in **Nanticoke** and Lambton.

"At this time, Ontario will consider the possible conversion of some of the units at **Nanticoke** and Lambton to natural gas, if necessary for system reliability," the report reads.

"Due to the lead times involved, planning and approval work for the natural gas pipeline infrastructure required to **Nanticoke** will begin soon."

As well, the province "will continue to explore opportunities for co-firing biomass with natural gas for any units converted to natural gas," the report added.

In the meantime, OPG will now start to plan the shutdown of two more units at **Nanticoke**, said Osborne.

"We will look at the staffing and technical implications of that," he said.

Daniel Pearce

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## Media Lambton Generating Station Pipeline Project: Lambton coal plant could be converted ; POWER GENERATION: THE COAL-FIRED STATION MAY BE A CANDIDATE FOR NATURAL GAS AFTER CONSTRUCTION OF A TORONTO PLANT WAS STOPPED

The London Free Press
Sat Dec 31 2011
Page: A7
Section: News
Byline: PAUL MORDEN, QMI AGENCY

SARNIA -- The next 12 months could determine if Ontario's coalfired power plant near Sarnia has a future.

Ontario Power Generation's Lambton station in Courtright is scheduled to close in 2014, as Ontario's Liberal government makes good on its promise -- delayed several times -- to phase out production of electricity from coal-fired power plants.

But the idea of converting the facility to a cleaner-burning fuel hasn't been ruled out.

"Ontario Power is investigating the conversion of its coal-fired unit to clean fuels, including natural gas and biomass," said Paul Gerard, a spokesperson with Ontario's Ministry of Energy.

"No decision has been made on conversion at the **Lambton Generating** Station."

**Union Gas** was asked in 2011 to prepare plans for a potential natural gas pipeline to feed **Lambton Generating** Station.

"I really believe if we're going to continue with **Lambton Generating** Station in either its present form or natural gas or bio-fuels, there's going to have to be some decisions made within 2012," said St. Clair Township Mayor Steve Arnold.

Two of the four units at the station were shut down a year ago and about 100 employees left. Another 300 workers continue to operate the two remaining coalfired units.

The municipality would feel the biggest impact if the remaining jobs, and the property taxes the station pays, are lost in 2014.

The potential property tax impact equals millions of dollars, Arnold said. "That is at stake here in the municipality."

Arnold said the township has teamed up with other municipalities facing the loss of coal plants to fight back against the way the Municipal Property Assessment Corp. has been devaluing the stations since the province announced they were to close.

"We're really hoping we'll see that put to bed in 2012," he said.

He believes the station's odds of remaining open past 2014 are good. Township officials continue to lobby the province and a recent change in direction for a natural gas-fired plant in the Toronto area, Arnold said, "makes **Lambton Generating** much more feasible . . . because we have everything already there."

The Ontario' government backed away from the Torontoarea plant following opposition from residents living nearby.

Arnold said existing rights-of-way could be used for upgraded transmission lines from the station in Courtright.

"If we get those in place, **Lambton Generating** becomes a viable option, in my humble opinion."



Illustration:
• Free Press file photo
• The **Lambton generating** station most recently has been scheduled to close in 2014.

# Fate of LGS still hanging

The Sarnia Observer
Fri Dec 30 2011
Page: A3
Section: News
Byline: PAUL MORDEN, THE OBSERVER

The next 12 months could determine if **Lambton Generating** Station has a future.

The power plant in Courtright is scheduled to close in 2014 as the Ontario government makes good on its promise to phase-out electricity from coal, but the idea of converting the facility to a cleaner-burning fuel hasn't been ruled out.

"Ontario Power is investigating the conversion of its coal-fired unit to clean fuels, including natural gas and biomass," said Paul Gerard, a spokesperson with Ontario's Ministry of Energy.

"No decision has been made on conversation at the **Lambton Generating** Station."

But, **Union Gas** was asked in 2011 to prepare plans for a potential natural gas pipeline to feed **Lambton Generating** Station.

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Township officials continue to lobby the province and a recent change in direction for a natural gas-fired plant in the Toronto area, Arnold said, "makes **Lambton Generating** much more feasible . . . because we have everything already there."

Ontario's Liberal government backed away from the Toronto-area plant following opposition from residents living nearby.

"We heard from residents that our current process to locate gas plants needed to improve," Energy Minister Chris Bentley said.

"As we move forward with our commitment to relocate this plant, we are reviewing the process of how future gas plants will be located in communities."

Arnold said existing right-of-ways could be used for upgraded transmission lines from the station in Courtright.

"If we get those in place, **Lambton Generating** becomes a viable option, in my humble opinion."

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Illustration:
• Observer file photo
• The future of the **Lambton Generating** Station could be decided in 2012.

# Nothing certain about power plant's conversion

Sarnia This Week
Wed Oct 26 2011
Page: 34
Section: News
Byline: QMI AGENCY

The president of **Union Gas** is doing some serious backpedalling about the possible conversion of the coal-fired **Lambton Generating** Station to burn natural gas.

Julie Dill was quoted in local radio reports Oct. 13 as saying a conversion of the coal-burning generating plant near Courtright is "a virtual certainty." The reports also stated **Union Gas** is planning to submit an application early next year for a pipeline to serve LGS.

"Apparently there was some confusion on what I was trying to convey," Dill said. "...There is nothing definitive at all. It could be years before this actually gets approved.

I do not recall saying it is a virtual certainty at all. That was not my intention because it is not virtually certain."

Dill said the Ontario government is going to conduct a post-election assessment of the province's energy needs and how it will be generated.

"The whole energy plan needs to be reviewed for Ontario to see if there's a need for additional generation at this time and if not now, when? Then it's about location and where the demand will actually come from."

Dill said **Union Gas** sees itself as a "natural complement" to the Liberal government's energy agenda.

If the province decides to go ahead with a natural gas conversion at LGS, **Union Gas** will be ready to assist, she said.

"But thats not our call to make."

LGS is slated to close in 2014 when the rest of the province's coal stations are shuttered. Two of the four coal-fired units at LGS were permanently shut down a year ago. About 100 employees left the station at that time.

Another 300 workers continue to operate the remaining two units and are hoping the province will opt for conversion over closure, as it has in Thunder Bay.

Six months ago, Ontario's Energy Minister Brad Duguid said an environmental assessment to burn biomass or natural gas at LGS was "imminent."

But an environmental assessment does not mean a conversion will happen, he said.

Meanwhile, Dill said **Union Gas** has no directive and no timeframe from the province.

In case a conversion gets approval, the utility is "contemplating" a natural gas pipeline to **Lambton Generating** Station, she said.

Earlier reports suggested public meetings about that pipeline would be held in Lambton County this fall, but Dill said Oct. 14 that nothing has been scheduled.

"We are not making application for a pipeline next year," she said. "That is not correct at all. I have no idea where that came from."

Illustration:
• Photo submitted Members of the Carruthers Foundation toured Petrolia's Charlotte Eleanor Englehart Hospital of Bluewater Health before it met in the Corey Room. The Foundation provides scholarships and bursaries for Lambton County students who are going on to post-secondary education. From left are Rosanne Orcutt, Gwen Harris, Marilyn Foster, Nancy Leaver, Karen Rutledge, Ted Evans, and Foundation president Larry Scully.

## Dawn gas plant gets $45-million upgrade

Chatham This Week
Wed Oct 19 2011
Page: 8
Section: News
Byline: HEATHER WRIGHT, QMI AGENCY

**Union Gas** says a new $45-million compressor station in Lambton County will help improve natural gas delivery and the environment.

The company's storage site in Dawn-Euphemia holds enough natural gas in underground reservoirs to heat 1.9 million homes for a year.

The new plant, which is powered by a turbine the size of a jet engine, began operating recently.

Julie Dill, president of **Union Gas**, says the new unit will help the company move more gas and will also help the environment.

"The technology that we've installed here is state-of-the-art and so consequently it's going to have significant reduction of both air and noise emissions so that's a real benefit to the community," say Dill.

She says while there were few complaints about the operations, neighbours should notice the difference in sound level.

Mike Shannon, vice-president of engineering and construction, says the single compression unit replaces five others which have been in service for a long time.

"The old Dawn 'A' plant is actually reciprocating engines -1950s, 1940s type of technology -so you would have been emitting different particulate matter and a higher noise level as well," he says.

"So what these units do in a fact is they reduce the noise level substantially and also they burn very, very cleanly."

The new compressor will also allow **Union Gas** to move natural gas more rapidly from Western Canada to Eastern Canada. That, says Dill, becomes even more important as Ontario Power Generation considers the possibility of converting the coal-fired **Lambton Generating** Station to burn natural gas and more companies choose to generate electricity with natural gas.

Edition: Final
Length: 266 words
Idnumber: 201110190039

# LGS gas pipeline open houses planned

The Sarnia Observer
Fri Aug 26 2011
Page: A3
Section: News
Byline: TYLER KULA, THE OBSERVER

The potential conversion of the coal-fired **Lambton Generating** Station to natural gas took another step forward recently as Ontario Power Generation gave **Union Gas** approval to hold public consultations this fall.

The talks, public open houses tentatively planned for October or November, would focus on minimizing the environmental impact of any project, said **Union Gas** spokesperson Andrea Stass.

"We are planning to initiate some public consultation on that pipeline but we're still very much in the preliminary stages," she said.

Ontario's Long-Term Energy Plan includes considering converting the coal generating station at Courtright to use natural gas or bio-mass.

A construction project would take two years, Stass said, meaning a plan would have to be set this year to meet Ontario's goal to stop using coal-fired electricity by 2014.

Information from the public consultations will be considered by the Ontario Energy Board, which must approve the project if it's to proceed, she said.

"We'll be looking at the physical environment, if there's any archaeological sites, if there's any species at risk."

Consultations will also be held with First Nations, she said.

"The whole point of the public consultation process is to actually determine what is the best route."

There's a corridor being eyed for the pipeline, between the utility station in St. Clair Township and the **Lambton Generating** Station (LGS), about six kilometres long.

The pipeline could be longer, depending on what route is decided upon, Stass said.

"We look at a number of factors to help us determine which is the most environmentally acceptable route between those two points."

There's no specific estimate yet on how much the project will cost, Stass said, but it will be multiple millions of dollars.

Announcements about the public open houses will be made in the early fall, she said.

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# Gas pipeline to LGS studied

The Sarnia Observer
Wed Jun 22 2011
Page: A1
Section: News
Byline: PAUL MORDEN, THE OBSERVER

Ontario Power Generation has asked **Union Gas** to prepare plans for a potential natural gas pipeline to feed the coal-fired **Lambton Generating** Station, which is scheduled to close in 2014.

**Union Gas** spokesperson Andrea Stass said it wouldn't need to be a long pipeline, but one with a large diameter, making it a "multi-million-dollar" project.

"We're still, obviously, in the early stages of this project," she said.

Ontario's Long-Term Energy Plan calls for the coal generating station at Courtright to be considered for conversion to use natural gas or bio-mass, Stass said.

Ontario Power Generation is also looking into the engineering work that would be needed to switch fuels at the Lambton station, said spokesperson Ted Gruetzner.

"But no decisions have been made yet."

Because **Union Gas** needs two years to construct a natural gas pipeline, "we are having discussions now," Stass said.

**Union Gas** doesn't have a potential route or a cost estimate at this point, she said.

"There is gas in the area so it won't be, necessarily, a very long pipeline."

**Union Gas** is currently in discussions and negotiations with Ontario Power Generation about the feasibility and plans for a pipeline, she said.

If the decision is made to go ahead with one, the plans would have to be set this year to meet Ontario's deadline to stop using coal-fired electricity in 2014, Stass said.

"That would have us going out to consult with the public on those plans later on this year."

An application would go to the Ontario Energy Board by the end of this year.

"They would review that and make some decision in 2012, and then depending on that, we would proceed with construction in 2014," Stass said.

**Union Gas** already "serves a good portion of the natural gas-fired generation in Ontario," she said.

Earlier this year, Ontario Energy Minister Brad Duguid said the government will have a better idea soon if it needs to convert Lambton to another fuel source to keep it running after 2014.

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For breaking news go to theobserver.ca, or check us out on Facebook and Twitter.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 9, schedule 2
Exhibit B1, Tab 9, pg 2

Preamble: Union states that "Historically, there have been a number of days during the summer months where gas is imported at Parkway from the TCPL system to fill storage at Dawn or to be exported at Kirkwall. Over the past two years, imports at Parkway from the TCPL system have diminished resulting in a fundamental shift to year-round exports through the Parkway compression as shown in Schedule 2. Year-round exports through the Parkway compression have impacted the ability to schedule maintenance activities for the Parkway A Unit and Parkway B Unit as well as the associated facilities."

TransCanada wishes to better understand the nature of these deliveries and the fundamental shift to year round exports.

a) In an Excel spreadsheet, please provide the data used to plot the graph in Exhibit B1, Tab 9, Schedule 2.

b) In an Excel spreadsheet, please provide the daily scheduled quantity for delivery through Parkway compression by service class. Please provide both the scheduled receipts as well as deliveries. If the sum of the receipts and deliveries do not equate to the net flow, please explain why.

c) In a format similar to the graph in Exhibit B1, Tab 9, pg 2, please provide the flow through the Parkway / Lisgar metering facility. Please also provide the data in Excel format, by service class.

---

**Response:**

a) Please see Attachment 1.

b) The graph in Exhibit B1, Tab 9, Schedule 2 represents the physical activity at the TCPL Parkway interconnect as measured by Union's check measurement. It does not equate to the

sum of the receipts and deliveries. The graph is intended to demonstrate the change in physical activity. It is not intended to support the activity by service class.

c) The Parkway (Consumers) and Lisgar metering facilities solely service Enbridge Gas Distribution. Union does not share customer specific activity.

**Net Flow Through Parkway Compression (Data)**

**Units = TJ**

| Date | 2009/10 | 2010/11 | 2006-2009 Minimum | 2006-2009 Maximum | Min-Max Spread |
|---|---|---|---|---|---|
| 01-Nov | 170 | 1,039 | 0 | 185 | 185 |
| 02-Nov | 374 | 1,236 | 196 | 442 | 247 |
| 03-Nov | 561 | 1,271 | 148 | 501 | 353 |
| 04-Nov | 867 | 1,175 | 108 | 422 | 314 |
| 05-Nov | 1,044 | 1,127 | -64 | 365 | 429 |
| 06-Nov | 1,034 | 1,178 | -80 | 371 | 451 |
| 07-Nov | 1,040 | 1,063 | 0 | 528 | 528 |
| 08-Nov | 607 | 1,146 | 43 | 616 | 572 |
| 09-Nov | 496 | 1,295 | -50 | 841 | 891 |
| 10-Nov | 512 | 1,260 | 0 | 546 | 546 |
| 11-Nov | 849 | 1,083 | 39 | 732 | 693 |
| 12-Nov | 976 | 962 | 140 | 757 | 617 |
| 13-Nov | 941 | 507 | 170 | 880 | 711 |
| 14-Nov | 770 | 642 | 52 | 322 | 270 |
| 15-Nov | 473 | 682 | -157 | 19 | 175 |
| 16-Nov | 530 | 827 | -158 | 260 | 418 |
| 17-Nov | 941 | 863 | -297 | 717 | 1,014 |
| 18-Nov | 1,097 | 1,169 | -17 | 1,152 | 1,168 |
| 19-Nov | 831 | 1,265 | 10 | 1,541 | 1,532 |
| 20-Nov | 826 | 1,313 | 159 | 1,688 | 1,529 |
| 21-Nov | 842 | 1,330 | 555 | 1,796 | 1,241 |
| 22-Nov | 716 | 1,281 | 634 | 1,693 | 1,058 |
| 23-Nov | 833 | 1,192 | 489 | 1,598 | 1,110 |
| 24-Nov | 953 | 1,401 | 321 | 1,389 | 1,069 |
| 25-Nov | 894 | 1,499 | 225 | 1,381 | 1,155 |
| 26-Nov | 791 | 1,562 | -35 | 1,407 | 1,442 |
| 27-Nov | 817 | 1,536 | -136 | 1,218 | 1,354 |
| 28-Nov | 796 | 1,521 | -5 | 1,178 | 1,183 |
| 29-Nov | 828 | 1,540 | 72 | 1,256 | 1,184 |
| 30-Nov | 808 | 1,600 | 140 | 1,231 | 1,091 |
| 01-Dec | 1,041 | 1,280 | -112 | 1,258 | 1,370 |
| 02-Dec | 1,045 | 1,382 | 377 | 1,424 | 1,047 |
| 03-Dec | 799 | 1,570 | 590 | 1,430 | 840 |
| 04-Dec | 916 | 1,561 | 838 | 1,456 | 618 |
| 05-Dec | 1,065 | 1,556 | 1,193 | 1,483 | 291 |
| 06-Dec | 1,134 | 1,625 | 1,264 | 1,563 | 299 |
| 07-Dec | 1,181 | 1,763 | 912 | 1,379 | 467 |
| 08-Dec | 1,370 | 1,694 | 1,243 | 1,700 | 457 |
| 09-Dec | 1,589 | 1,736 | 1,194 | 1,811 | 617 |

| | | | | | |
|---|---|---|---|---|---|
| 10-Dec | 1,656 | 1,791 | 662 | 1,594 | 933 |
| 11-Dec | 1,793 | 1,647 | 480 | 1,864 | 1,384 |
| 12-Dec | 1,799 | 1,128 | 765 | 1,836 | 1,071 |
| 13-Dec | 1,545 | 1,388 | 599 | 1,741 | 1,142 |
| 14-Dec | 1,391 | 1,641 | 197 | 1,619 | 1,422 |
| 15-Dec | 1,403 | 1,646 | 166 | 1,550 | 1,383 |
| 16-Dec | 1,640 | 1,608 | 0 | 1,534 | 1,534 |
| 17-Dec | 1,732 | 1,673 | -100 | 1,527 | 1,627 |
| 18-Dec | 1,756 | 1,644 | -43 | 1,629 | 1,672 |
| 19-Dec | 1,663 | 1,420 | 300 | 1,686 | 1,386 |
| 20-Dec | 1,659 | 1,320 | 581 | 1,836 | 1,255 |
| 21-Dec | 1,616 | 1,529 | 412 | 1,699 | 1,287 |
| 22-Dec | 1,690 | 1,529 | 509 | 1,521 | 1,012 |
| 23-Dec | 1,727 | 1,567 | 205 | 1,427 | 1,222 |
| 24-Dec | 1,714 | 1,515 | -114 | 1,342 | 1,457 |
| 25-Dec | 1,350 | 1,458 | -202 | 1,028 | 1,229 |
| 26-Dec | 1,144 | 1,550 | -192 | 904 | 1,096 |
| 27-Dec | 1,120 | 1,596 | 44 | 951 | 907 |
| 28-Dec | 1,195 | 1,530 | 438 | 981 | 542 |
| 29-Dec | 1,590 | 1,482 | 491 | 927 | 436 |
| 30-Dec | 1,837 | 1,402 | 718 | 948 | 230 |
| 31-Dec | 1,655 | 1,032 | 491 | 1,363 | 871 |
| 01-Jan | 1,254 | 873 | 377 | 1,787 | 1,410 |
| 02-Jan | 1,341 | 812 | 140 | 1,457 | 1,317 |
| 03-Jan | 1,548 | 1,488 | 419 | 1,522 | 1,104 |
| 04-Jan | 1,592 | 1,569 | 232 | 1,571 | 1,339 |
| 05-Jan | 1,676 | 1,581 | -1 | 1,580 | 1,581 |
| 06-Jan | 1,728 | 1,702 | -194 | 1,543 | 1,737 |
| 07-Jan | 1,692 | 1,663 | -132 | 1,445 | 1,577 |
| 08-Jan | 1,558 | 1,572 | 54 | 1,480 | 1,426 |
| 09-Jan | 1,691 | 1,580 | 67 | 1,794 | 1,727 |
| 10-Jan | 1,679 | 1,662 | 440 | 1,807 | 1,366 |
| 11-Jan | 1,373 | 1,785 | 923 | 1,606 | 683 |
| 12-Jan | 1,637 | 1,763 | 670 | 1,469 | 799 |
| 13-Jan | 1,422 | 1,719 | 399 | 1,449 | 1,050 |
| 14-Jan | 1,449 | 1,734 | 724 | 1,617 | 892 |
| 15-Jan | 1,324 | 1,728 | 813 | 1,776 | 963 |
| 16-Jan | 1,169 | 1,673 | 1,257 | 1,571 | 314 |
| 17-Jan | 887 | 1,701 | 1,247 | 1,508 | 261 |
| 18-Jan | 1,149 | 1,734 | 1,108 | 1,554 | 446 |
| 19-Jan | 1,342 | 1,558 | 789 | 1,386 | 597 |
| 20-Jan | 1,248 | 1,612 | 909 | 1,477 | 568 |
| 21-Jan | 1,543 | 1,535 | 1,340 | 1,694 | 354 |
| 22-Jan | 1,396 | 1,706 | 1,061 | 1,662 | 602 |
| 23-Jan | 1,248 | 1,767 | 978 | 1,372 | 393 |
| 24-Jan | 1,055 | 1,680 | 969 | 1,338 | 369 |
| 25-Jan | 903 | 1,694 | 1,280 | 1,401 | 121 |

| | | | | | |
|---|---|---|---|---|---|
| 26-Jan | 973 | 1,658 | 983 | 1,417 | 434 |
| 27-Jan | 1,133 | 1,509 | 1,200 | 1,601 | 401 |
| 28-Jan | 1,206 | 1,488 | 1,291 | 1,526 | 236 |
| 29-Jan | 1,887 | 1,327 | 1,221 | 1,607 | 385 |
| 30-Jan | 1,856 | 1,418 | 1,189 | 1,417 | 229 |
| 31-Jan | 1,865 | 1,597 | 1,174 | 1,527 | 353 |
| 01-Feb | 1,692 | 1,775 | 1,125 | 1,378 | 253 |
| 02-Feb | 1,760 | 1,729 | 1,068 | 1,399 | 330 |
| 03-Feb | 1,551 | 1,689 | 827 | 1,434 | 607 |
| 04-Feb | 1,552 | 1,558 | 829 | 1,603 | 774 |
| 05-Feb | 1,728 | 1,317 | 614 | 1,668 | 1,055 |
| 06-Feb | 1,493 | 983 | 692 | 1,608 | 916 |
| 07-Feb | 1,653 | 1,014 | 708 | 1,355 | 647 |
| 08-Feb | 1,685 | 1,529 | 592 | 1,361 | 769 |
| 09-Feb | 1,782 | 1,705 | 839 | 1,137 | 298 |
| 10-Feb | 1,758 | 1,658 | 918 | 1,215 | 298 |
| 11-Feb | 1,767 | 1,782 | 861 | 1,473 | 612 |
| 12-Feb | 1,832 | 1,600 | 617 | 1,663 | 1,047 |
| 13-Feb | 1,758 | 1,250 | 1,059 | 1,555 | 496 |
| 14-Feb | 1,113 | 1,329 | 922 | 1,586 | 663 |
| 15-Feb | 1,147 | 1,600 | 883 | 1,587 | 704 |
| 16-Feb | 1,157 | 1,692 | 986 | 1,470 | 484 |
| 17-Feb | 1,430 | 1,389 | 1,095 | 1,281 | 186 |
| 18-Feb | 1,552 | 1,091 | 913 | 1,218 | 305 |
| 19-Feb | 1,396 | 1,060 | 740 | 1,323 | 583 |
| 20-Feb | 1,230 | 1,485 | 1,028 | 1,446 | 418 |
| 21-Feb | 930 | 1,883 | 680 | 1,647 | 967 |
| 22-Feb | 1,095 | 2,033 | 675 | 1,510 | 835 |
| 23-Feb | 1,137 | 2,031 | 1,125 | 1,397 | 272 |
| 24-Feb | 1,014 | 1,800 | 1,077 | 1,436 | 359 |
| 25-Feb | 1,076 | 1,682 | 1,019 | 1,518 | 500 |
| 26-Feb | 1,383 | 1,800 | 961 | 1,228 | 267 |
| 27-Feb | 986 | 1,784 | 780 | 1,305 | 525 |
| 28-Feb | 771 | 1,413 | 964 | 1,457 | 493 |
| 01-Mar | 795 | 1,452 | 661 | 1,588 | 928 |
| 02-Mar | 1,238 | 1,458 | 1,108 | 1,577 | 469 |
| 03-Mar | 1,319 | 1,640 | 872 | 1,568 | 696 |
| 04-Mar | 1,375 | 1,569 | 674 | 1,691 | 1,016 |
| 05-Mar | 1,255 | 1,387 | 744 | 1,328 | 584 |
| 06-Mar | 1,042 | 981 | 1,048 | 1,394 | 345 |
| 07-Mar | 684 | 1,573 | 386 | 1,329 | 943 |
| 08-Mar | 757 | 1,548 | 292 | 1,286 | 994 |
| 09-Mar | 872 | 1,300 | 416 | 1,502 | 1,086 |
| 10-Mar | 950 | 1,343 | 856 | 1,445 | 589 |
| 11-Mar | 746 | 1,079 | 442 | 1,312 | 870 |
| 12-Mar | 671 | 820 | 467 | 1,516 | 1,049 |
| 13-Mar | 538 | 813 | 522 | 1,614 | 1,091 |

| | | | | | |
|---|---|---|---|---|---|
| 14-Mar | 606 | 994 | 267 | 1,264 | 997 |
| 15-Mar | 803 | 1,234 | 168 | 889 | 722 |
| 16-Mar | 737 | 947 | 542 | 755 | 213 |
| 17-Mar | 651 | 777 | 564 | 1,040 | 475 |
| 18-Mar | 508 | 678 | 336 | 1,043 | 707 |
| 19-Mar | 357 | 744 | 379 | 959 | 580 |
| 20-Mar | 329 | 868 | 861 | 909 | 48 |
| 21-Mar | 499 | 684 | 897 | 1,208 | 310 |
| 22-Mar | 708 | 784 | 446 | 982 | 536 |
| 23-Mar | 826 | 1,359 | 115 | 883 | 768 |
| 24-Mar | 1,111 | 1,530 | 74 | 1,198 | 1,124 |
| 25-Mar | 1,223 | 1,438 | -322 | 1,127 | 1,450 |
| 26-Mar | 1,542 | 1,398 | -308 | 1,096 | 1,404 |
| 27-Mar | 1,596 | 1,546 | -302 | 798 | 1,100 |
| 28-Mar | 1,493 | 1,433 | -516 | 253 | 769 |
| 29-Mar | 1,561 | 1,446 | -51 | 785 | 836 |
| 30-Mar | 1,557 | 1,240 | -46 | 669 | 714 |
| 31-Mar | 1,496 | 1,195 | -438 | 665 | 1,103 |
| 01-Apr | 1,028 | 1,274 | -577 | 721 | 1,299 |
| 02-Apr | 502 | 1,153 | -201 | 529 | 730 |
| 03-Apr | 147 | 960 | -137 | 634 | 771 |
| 04-Apr | 167 | 1,081 | -40 | 754 | 794 |
| 05-Apr | 269 | 1,359 | 242 | 790 | 548 |
| 06-Apr | 377 | 1,546 | -39 | 597 | 636 |
| 07-Apr | 1,013 | 1,540 | -30 | 1,198 | 1,228 |
| 08-Apr | 1,230 | 1,248 | 162 | 1,309 | 1,147 |
| 09-Apr | 1,484 | 961 | 97 | 1,377 | 1,280 |
| 10-Apr | 1,512 | 601 | 42 | 1,043 | 1,002 |
| 11-Apr | 1,237 | 536 | 336 | 914 | 578 |
| 12-Apr | 1,236 | 630 | 368 | 935 | 566 |
| 13-Apr | 1,236 | 825 | 191 | 818 | 627 |
| 14-Apr | 1,380 | 976 | 3 | 727 | 724 |
| 15-Apr | 1,168 | 1,081 | -195 | 622 | 817 |
| 16-Apr | 1,120 | 1,125 | 44 | 161 | 117 |
| 17-Apr | 999 | 1,086 | 0 | 284 | 284 |
| 18-Apr | 994 | 1,080 | -428 | 25 | 453 |
| 19-Apr | 980 | 1,301 | -598 | -192 | 406 |
| 20-Apr | 772 | 1,295 | -751 | -151 | 600 |
| 21-Apr | 699 | 1,314 | -817 | -4 | 813 |
| 22-Apr | 1,115 | 1,285 | -749 | 466 | 1,215 |
| 23-Apr | 1,212 | 706 | -1,127 | 331 | 1,458 |
| 24-Apr | 1,263 | 600 | -825 | 221 | 1,045 |
| 25-Apr | 1,041 | 659 | -567 | -303 | 264 |
| 26-Apr | 1,222 | 718 | -637 | -440 | 197 |
| 27-Apr | 1,386 | 677 | -603 | -151 | 452 |
| 28-Apr | 1,552 | 590 | -597 | -306 | 291 |
| 29-Apr | 1,562 | 597 | -585 | 0 | 585 |

| | | | | | |
|---|---|---|---|---|---|
| 30-Apr | 1,551 | 674 | -744 | 148 | 893 |
| 01-May | 1,235 | 456 | -475 | 158 | 632 |
| 02-May | 1,014 | 515 | -475 | 0 | 475 |
| 03-May | 1,096 | 679 | -559 | -171 | 387 |
| 04-May | 1,253 | 809 | -582 | -414 | 169 |
| 05-May | 998 | 810 | -810 | -298 | 512 |
| 06-May | 875 | 714 | -897 | -347 | 550 |
| 07-May | 857 | 746 | -779 | -313 | 466 |
| 08-May | 904 | 463 | -775 | -234 | 541 |
| 09-May | 1,125 | 476 | -534 | 0 | 534 |
| 10-May | 1,189 | 528 | -503 | 0 | 503 |
| 11-May | 1,310 | 406 | -629 | 0 | 629 |
| 12-May | 1,480 | 217 | -538 | -324 | 214 |
| 13-May | 1,521 | 221 | -719 | -280 | 439 |
| 14-May | 1,532 | 249 | -708 | -342 | 366 |
| 15-May | 1,432 | 144 | -619 | -398 | 221 |
| 16-May | 1,256 | 567 | -534 | -463 | 71 |
| 17-May | 1,248 | 901 | -572 | -112 | 460 |
| 18-May | 1,361 | 704 | -706 | -317 | 389 |
| 19-May | 1,299 | 492 | -582 | -373 | 209 |
| 20-May | 1,308 | 447 | -714 | -250 | 464 |
| 21-May | 1,255 | 480 | -653 | -227 | 426 |
| 22-May | 1,260 | 400 | -680 | -151 | 528 |
| 23-May | 947 | 235 | -622 | -267 | 355 |
| 24-May | 787 | 354 | -660 | -555 | 105 |
| 25-May | 856 | 555 | -736 | -659 | 76 |
| 26-May | 1,392 | 461 | -817 | -422 | 395 |
| 27-May | 1,338 | 506 | -1,056 | -494 | 561 |
| 28-May | 1,219 | 404 | -984 | -297 | 687 |
| 29-May | 809 | 210 | -996 | -177 | 820 |
| 30-May | 680 | 298 | -931 | -450 | 482 |
| 31-May | 900 | 453 | -753 | -358 | 395 |
| 01-Jun | 972 | 540 | -856 | -287 | 569 |
| 02-Jun | 940 | 533 | -747 | -247 | 500 |
| 03-Jun | 1,014 | 495 | -817 | -231 | 586 |
| 04-Jun | 1,043 | 272 | -877 | -186 | 690 |
| 05-Jun | 876 | 0 | -802 | -345 | 458 |
| 06-Jun | 661 | 278 | -1,010 | -358 | 652 |
| 07-Jun | 685 | 373 | -1,241 | -586 | 655 |
| 08-Jun | 754 | 656 | -1,335 | -538 | 797 |
| 09-Jun | 857 | 985 | -1,412 | -484 | 928 |
| 10-Jun | 860 | 894 | -1,298 | -386 | 912 |
| 11-Jun | 926 | 477 | -1,245 | -343 | 903 |
| 12-Jun | 895 | 181 | -1,029 | -433 | 596 |
| 13-Jun | 715 | 0 | -1,206 | -757 | 449 |
| 14-Jun | 787 | 342 | -1,430 | -1,030 | 400 |
| 15-Jun | 880 | 335 | -1,144 | -802 | 342 |

| | | | | | |
|---|---|---|---|---|---|
| 16-Jun | 975 | 339 | -1,178 | -757 | 421 |
| 17-Jun | 1,083 | 357 | -1,071 | -394 | 677 |
| 18-Jun | 1,194 | 286 | -936 | -303 | 633 |
| 19-Jun | 1,185 | 150 | -977 | -545 | 432 |
| 20-Jun | 1,177 | 215 | -768 | -693 | 75 |
| 21-Jun | 1,178 | 526 | -817 | -651 | 165 |
| 22-Jun | 1,224 | 699 | -1,049 | -656 | 393 |
| 23-Jun | 1,210 | 637 | -970 | -496 | 474 |
| 24-Jun | 1,209 | 516 | -1,073 | -388 | 685 |
| 25-Jun | 1,209 | 395 | -1,027 | -332 | 694 |
| 26-Jun | 1,293 | 140 | -761 | -276 | 485 |
| 27-Jun | 1,345 | 307 | -701 | -371 | 331 |
| 28-Jun | 1,262 | 429 | -883 | -645 | 238 |
| 29-Jun | 1,322 | 476 | -1,082 | -615 | 467 |
| 30-Jun | 1,043 | 570 | -1,119 | -522 | 597 |
| 01-Jul | 1,348 | 525 | -1,020 | -399 | 622 |
| 02-Jul | 1,360 | 405 | -837 | -540 | 298 |
| 03-Jul | 1,315 | 365 | -919 | -485 | 434 |
| 04-Jul | 1,123 | 477 | -1,022 | -615 | 407 |
| 05-Jul | 1,035 | 468 | -1,051 | -672 | 380 |
| 06-Jul | 1,326 | 533 | -1,133 | -634 | 499 |
| 07-Jul | 1,336 | 611 | -1,162 | -454 | 708 |
| 08-Jul | 940 | 657 | -909 | -506 | 403 |
| 09-Jul | 1,310 | 530 | -875 | -600 | 275 |
| 10-Jul | 1,382 | 310 | -901 | -520 | 381 |
| 11-Jul | 1,449 | 438 | -982 | -468 | 514 |
| 12-Jul | 1,465 | 821 | -915 | -581 | 334 |
| 13-Jul | 1,474 | 916 | -1,091 | -512 | 579 |
| 14-Jul | 1,459 | 616 | -1,058 | -508 | 550 |
| 15-Jul | 1,454 | 358 | -905 | -495 | 409 |
| 16-Jul | 1,378 | 339 | -758 | -523 | 236 |
| 17-Jul | 1,341 | 235 | -771 | -503 | 268 |
| 18-Jul | 1,016 | 426 | -786 | -472 | 315 |
| 19-Jul | 1,303 | 726 | -913 | -380 | 534 |
| 20-Jul | 1,348 | 814 | -891 | -349 | 542 |
| 21-Jul | 1,355 | 1,069 | -917 | -422 | 494 |
| 22-Jul | 1,459 | 1,076 | -939 | -491 | 448 |
| 23-Jul | 1,381 | 859 | -604 | -486 | 118 |
| 24-Jul | 1,263 | 774 | -713 | -489 | 224 |
| 25-Jul | 1,329 | 614 | -898 | -377 | 521 |
| 26-Jul | 1,256 | 674 | -686 | -404 | 282 |
| 27-Jul | 1,244 | 548 | -834 | -575 | 259 |
| 28-Jul | 1,243 | 533 | -798 | -548 | 250 |
| 29-Jul | 1,043 | 544 | -833 | -273 | 559 |
| 30-Jul | 986 | 497 | -727 | -307 | 421 |
| 31-Jul | 787 | 491 | -731 | -351 | 381 |
| 01-Aug | 668 | 222 | -667 | -435 | 232 |

| | | | | | |
|---|---|---|---|---|---|
| 02-Aug | 676 | 430 | -465 | -298 | 167 |
| 03-Aug | 648 | 548 | -571 | -302 | 269 |
| 04-Aug | 984 | 531 | -917 | -329 | 588 |
| 05-Aug | 962 | 540 | -985 | -159 | 825 |
| 06-Aug | 1,112 | 427 | -932 | 0 | 932 |
| 07-Aug | 939 | 0 | -695 | 0 | 695 |
| 08-Aug | 786 | 155 | -489 | 0 | 489 |
| 09-Aug | 790 | 261 | -646 | -20 | 625 |
| 10-Aug | 961 | 374 | -833 | 0 | 833 |
| 11-Aug | 1,005 | 374 | -859 | 0 | 859 |
| 12-Aug | 1,217 | 282 | -886 | 0 | 886 |
| 13-Aug | 792 | 276 | -886 | 0 | 886 |
| 14-Aug | 879 | 357 | -946 | 0 | 946 |
| 15-Aug | 673 | 235 | -595 | 0 | 595 |
| 16-Aug | 742 | 331 | -563 | 0 | 563 |
| 17-Aug | 778 | 410 | -642 | 47 | 689 |
| 18-Aug | 581 | 439 | -830 | 359 | 1,189 |
| 19-Aug | 849 | 496 | -1,045 | 368 | 1,413 |
| 20-Aug | 886 | 507 | -796 | 479 | 1,275 |
| 21-Aug | 632 | 431 | -822 | 444 | 1,266 |
| 22-Aug | 588 | 301 | -555 | 487 | 1,043 |
| 23-Aug | 705 | 344 | -788 | 391 | 1,179 |
| 24-Aug | 716 | 467 | -802 | 248 | 1,049 |
| 25-Aug | 770 | 403 | -751 | 340 | 1,091 |
| 26-Aug | 1,021 | 346 | -708 | 420 | 1,128 |
| 27-Aug | 979 | 201 | -534 | 451 | 985 |
| 28-Aug | 975 | 106 | -642 | 468 | 1,110 |
| 29-Aug | 911 | 142 | -533 | 324 | 857 |
| 30-Aug | 990 | 40 | -834 | 1 | 835 |
| 31-Aug | 1,210 | 144 | -636 | 0 | 636 |
| 01-Sep | 1,263 | 1 | -689 | 0 | 689 |
| 02-Sep | 1,229 | 184 | -635 | 168 | 802 |
| 03-Sep | 1,143 | 550 | -497 | 84 | 581 |
| 04-Sep | 934 | 347 | -336 | 0 | 336 |
| 05-Sep | 560 | 331 | -498 | 0 | 498 |
| 06-Sep | 518 | 209 | -551 | -180 | 371 |
| 07-Sep | 597 | 143 | -507 | -203 | 304 |
| 08-Sep | 746 | 356 | -397 | -220 | 177 |
| 09-Sep | 1,119 | 433 | -444 | -73 | 371 |
| 10-Sep | 1,153 | 397 | -448 | -37 | 411 |
| 11-Sep | 1,020 | 411 | -564 | 0 | 564 |
| 12-Sep | 829 | 291 | -515 | -74 | 442 |
| 13-Sep | 894 | 331 | -638 | 238 | 876 |
| 14-Sep | 1,027 | 430 | -848 | 306 | 1,154 |
| 15-Sep | 844 | 469 | -517 | 333 | 851 |
| 16-Sep | 1,060 | 607 | -529 | 283 | 812 |
| 17-Sep | 1,249 | 466 | -551 | 200 | 751 |

| | | | | | |
|---|---|---|---|---|---|
| 18-Sep | 1,215 | 217 | -709 | 180 | 889 |
| 19-Sep | 1,147 | 128 | -458 | 85 | 543 |
| 20-Sep | 1,208 | 178 | -720 | 179 | 899 |
| 21-Sep | 1,215 | 297 | -1,045 | 66 | 1,111 |
| 22-Sep | 1,088 | 462 | -903 | 283 | 1,186 |
| 23-Sep | 1,110 | 541 | -793 | 352 | 1,145 |
| 24-Sep | 1,155 | 585 | -657 | 355 | 1,012 |
| 25-Sep | 1,159 | 469 | -675 | 355 | 1,029 |
| 26-Sep | 916 | 119 | -652 | 311 | 963 |
| 27-Sep | 921 | 294 | -819 | 551 | 1,370 |
| 28-Sep | 739 | 548 | -878 | 17 | 895 |
| 29-Sep | 622 | 565 | -775 | -100 | 675 |
| 30-Sep | 921 | 527 | -641 | 0 | 641 |
| 01-Oct | 976 | 56 | -506 | 142 | 648 |
| 02-Oct | 1,219 | 460 | -359 | 181 | 540 |
| 03-Oct | 1,083 | 420 | -322 | 0 | 322 |
| 04-Oct | 1,177 | 458 | -493 | 0 | 493 |
| 05-Oct | 1,370 | 562 | -471 | -113 | 358 |
| 06-Oct | 1,216 | 592 | -421 | 0 | 420 |
| 07-Oct | 1,263 | 663 | -310 | 4 | 314 |
| 08-Oct | 699 | 672 | -407 | 208 | 615 |
| 09-Oct | 791 | 524 | -250 | 206 | 456 |
| 10-Oct | 1,061 | 342 | -616 | 262 | 878 |
| 11-Oct | 989 | 228 | -320 | 88 | 409 |
| 12-Oct | 1,085 | 371 | -600 | 285 | 884 |
| 13-Oct | 1,254 | 579 | -553 | 250 | 803 |
| 14-Oct | 1,143 | 606 | -588 | 571 | 1,159 |
| 15-Oct | 1,205 | 617 | -322 | 545 | 868 |
| 16-Oct | 1,204 | 667 | -226 | 618 | 844 |
| 17-Oct | 1,076 | 563 | -216 | 340 | 556 |
| 18-Oct | 1,132 | 570 | -297 | 216 | 512 |
| 19-Oct | 1,174 | 699 | -280 | 171 | 451 |
| 20-Oct | 1,050 | 825 | -501 | 139 | 640 |
| 21-Oct | 632 | 802 | -491 | 149 | 640 |
| 22-Oct | 835 | 740 | -497 | 376 | 873 |
| 23-Oct | 639 | 742 | -298 | 555 | 854 |
| 24-Oct | 352 | 678 | -145 | 542 | 687 |
| 25-Oct | 428 | 673 | -48 | 143 | 191 |
| 26-Oct | 412 | 861 | -248 | 347 | 595 |
| 27-Oct | 416 | 959 | -1 | 484 | 485 |
| 28-Oct | 343 | 1,144 | -140 | 532 | 672 |
| 29-Oct | 822 | 1,452 | 132 | 669 | 537 |
| 30-Oct | 965 | 1,464 | 99 | 931 | 832 |
| 31-Oct | 764 | 1,465 | 0 | 700 | 700 |

UNION GAS LIMITED

Answer to Interrogatory from
City of Kitchener

Ref: Exhibit B1, Summary Schedule 2

a) When did the most recent rebuild of the regulating components that control the pressure and capacity out of the Kitchener Gate Station (KGS) serving the gas distribution utility of Kitchener take place and what were the associated capital costs?

b) What was the design minimum operating delivery pressure(s) of the KGS during this most recent rebuild?

c) What has been the lowest actual winter set delivery pressure provided by Union from the High Pressure feed at the KGS since the most recent rebuild? How many times and for what duration of time has the actual winter set delivery pressure reached this minimum experienced level?

d) What was the design maximum pressure of the High Pressure outlet of the KGS at the time of rebuild and what amount of capacity was it designed for? Has Kitchener exceeded that capacity in the last 5 years?

e) Are the most recent rebuild capital costs of the KGS fully depreciated? If not, what is the net book value of these capital costs as of December 31, 2012 and December 31, 2013, respectively?

f) What are the designed and remaining life spans of the KGS and the Plains Road Station serving the gas distribution utility of Kitchener?

g) When is the next rebuild of the KGS and the Plains Road Station scheduled to occur?

h) What are the associated capital costs of each scheduled station rebuild?

i) What duration would be added to the remaining in-service life spans of each station by the scheduled rebuilds?

j) With respect to Union's facilities fed from its Dawn Trafalgar system that are adjacent to facilities serving Kitchener, have there been sustainable reductions in the utilization of existing capacity due to industrial demand destruction that reinforce the integrity of design minimum operating pressures of Union's facilities downstream of the KGS into Waterloo and St. Jacobs?

k) Has Union evaluated the feasibility of facilities for its own system integrity or expansion that could back feed the eastern portion of Kitchener's franchise area in Bridgeport? If so, please provide a copy of this evaluation.

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**Response:**

a) The most recent rebuild was in 2003. The capital cost of the rebuild was $53,000.

b) The design minimum operating delivery pressure is 207 kPa.

c) The lowest actual set pressure has been 1,380 kPa. It has reached this level one time for a period of one hour.

d) The design maximum pressure was 1,900 kPa. The design capacity was 115,000 $m^3$/hr. Kitchener has not exceeded that capacity in the last 5 years.

e) No. The most recent rebuild costs are not fully depreciated. As Union uses group method accounting, accumulated depreciation is maintained for the entire group, not for an individual asset. The estimated net book value for the most recent rebuild is as follows:

| Year Ending | ($000's) |
|---|---|
| December 31, 2012 | $40.9 |
| December 31, 2013 | $39.3 |

f) The design and remaining life spans for these stations are indefinite until load changes.

g) The next rebuild will occur when load is added by contract, as requested by customer.

h) N/A. See response at g) above.

i) There are no scheduled rebuilds in the present forecast.

j) No. There has not been a decrease in demand as new loads have been attached.

k) Union has not completed this feasibility study.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex. B1/T9.

The evidence provides details on Union's Parkway West construction project, scheduled for completion in 2014 and expected to cost $215 million in aggregate.

a) Please detail the rate impact, by rate class, in each of 2012, 2013 and 2014, of the evidenced capital expenditures.

b) Please file a copy of Union's March 13, 2012 *Union Gas Limited Parkway Extension Project and Dawn to Parkway Binding Transportation Open Season* document.

c) Please explain the extent to which the facilities addressed in the referenced evidence will be used to deliver, or in support of, services described in the open season document filed in response to part b. of this interrogatory.

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**Response:**

a) Please see the response at Exhibit J.B-1-7-8 c).

b) Please see the response at Exhibit J.B-1-7-9 a).

c) Please see the response at Exhibit J.B-1-7-9 c) and Exhibit J.B-1-7-14 c).

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-Housing Providers of Ontario ("FRPO")

Ref: Exhibit B1, Tab 9

Parkway West Construction Proposal: Union states " Under current system design however, loss of the Parkway A Unit (24,000 HP) results in a loss of delivery capability to Parkway (TCPL) of 1.0 PJ/d. Loss of the Parkway B Unit (47,000 HP) results in a loss of delivery capability to Parkway (TCPL) of 1.8 PJ/d. An outage of either the Parkway A Unit or the Parkway B Unit could result in the loss of key markets east of Parkway in Ontario, eastern Canada and the U.S. Northeast, particularly during periods of peak demand.

a) Has Union, in conjunction with TCPL, run coordinated simulations (e.g, through the Eastern Canadian Mutual Assistance Program (ECMAP) or other coordination) to determine the impact of the loss of either or both existing compressor units on meeting peak winter demands?

b) If so, please file the high level results of the exercise?

c) To Union's knowledge, does TCPL have excess capacity to eastern Canada and the US Northeast? If so, how much?

d) Please provide the result of how much capacity through Parkway would be limited in a peak day scenario whereby Parkway Compressor A is unavailable and both Lobo and Bright's backup compressors are being run to keep the line pressure as high as possible in that scenario.

e) What evidence is Union relying on to reach the conclusion of loss of key markets?

---

**Response:**

a) Union has not run co-ordinated simulations with TCPL to determine the impact of the loss of either or both existing compressor units on meeting peak winter demands.

b) Please see the response at a) above.

c) Union believes that TCPL has some excess capacity to supply eastern Canada and the U.S. Northeast but does not know how much or whether space would be available.

d) Please see the response at Exhibit J.B-1-7-12 b).

e) Please see the response at Exhibit J.B-1-1-2 a).

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-Housing Providers of Ontario ("FRPO")

Ref: Exhibit B1, Tab 9

Union states "Union estimates that design day demand for exports through Parkway compression could exceed 3.0PJ/d by 2015/16" (page 2, lines 15 and 16) and "No capacity created by the LCU protection at Parkway will be sold as firm transmission capacity" (page 6 lines 13 and 14).

a) Please confirm our understanding that the cumulative capacity at this time is 2.8PJ/ day as the simple sum of the capacities of the two existing compressors. If not, please provide the existing capacity and explain its derivation.
b) How does Union propose to feed the 3.0+ PJ/day forecasted demands of 2015/2016?
c) Please provide the amount of interest submitted during Union's Open Season for the Parkway Extension Project which closes April 25, 2012.
d) Please provide documentation of communication between Union and Enbridge concerning additional flows out of Parkway to support Enbridge's proposed GTA reinforcement project.
   i. Please ensure the documentation provides the amount of incremental gas sought by Enbridge and required minimum pressures.
   ii. Please comment on how Union would propose to meet those stated needs.

---

**Response:**

a) Please see the response at Exhibit J.B-1-7-4 d) i).

b) Please see the response at Exhibit J.B-1-7-14 c) i).

c) Please see the response at Exhibit J.B-1-7-14 c) i).

d) (i) Union anticipates that Enbridge will bid in the Dawn-Parkway Open Season (See the response at Exhibit J.B-1-7-14 c) i)) for any volumes to supply the proposed GTA Project through the Dawn-Parkway system. Please also see the response at Exhibit J.B-1-7-9 a).
(ii) Please see the responses at Exhibit J.B-1-7-14 c) i) and Exhibit J.B-1-7-2 a).

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference**:** Exhibit B1, Tab 6, Page 2

Union discusses its integrity program and also provides a forecast for its 2013 integrity program. APPrO wishes to better understand Unions IMP. Union forecasts 2013 IMP expenditures of $15.46 million and $14.73 million respectively for Capital and O&M expenditures in Table 1.

a) Please indicate if these expenditures are based on an average of prior expenditures by plant type, pre-survey work already completed or some other means.

b) Please summarize the results of the IMP program since 2007 and in particular please indicate the implications for future IMP program expenditures.

c) Please provide a forecast of IMP programs over the next 5 years.

d) Please elaborate on changes Union has made to its design standards as a result of the IMP programs since 2002.

---

**Response:**

a) These expenditures are based on a combination of prior work completed by asset category and work still to be complete to advance the integrity management programs for each of the asset groups.

b) The program is doing what it was intended to do – finding and addressing issues within the pipeline system before they become major issues. Within the Pipeline Asset Integrity Management ("AIM") Program, more defects have been detected and there have been challenges with getting successful inspections completed. As a result, more work will need to be completed on these lines in the future beyond the initial baseline assessment phase to ensure all of the issues are adequately addressed and the integrity of the lines is maintained.

c) Please see the response at Exhibit J.B-1-3-6.

d) Union has not made major changes to its design standards, other than to ensure that restrictions are not placed within the pipelines that operate at or above 30 % SMYS that would make them difficult to pig.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference: Exhibit B1, Tab 6, Page 19

Union discusses its plan to replace the existing NPS 16 pressure control bypass valve at Dawn Great Lakes with a 36" control valve to reduce pressure loss and improve design efficiency. In order to better understand the need for the expenditure:

a) Please confirm that this valve is in the Dawn yard at the interconnect between Union & TCPL. If not confirmed please provide additional information about the other interconnection pipeline

b) Please elaborate on the specific system benefits of the reduced pressure loss that will be gained from replacing this valve.

c) Union made certain modifications in the last several years to accommodate Dawn to Dawn-TCPL firm deliveries. Does this expenditure relate to the provision of this service?

d) Please provide receipt/delivery information at the Dawn – Great Lakes measurement facility from November 2010 to the present to show how flows that are changing will subsequently benefit from the reduced pressure loss.

e) What additional revenue from 2013 onwards will be associated with this expenditure?

---

**Response:**

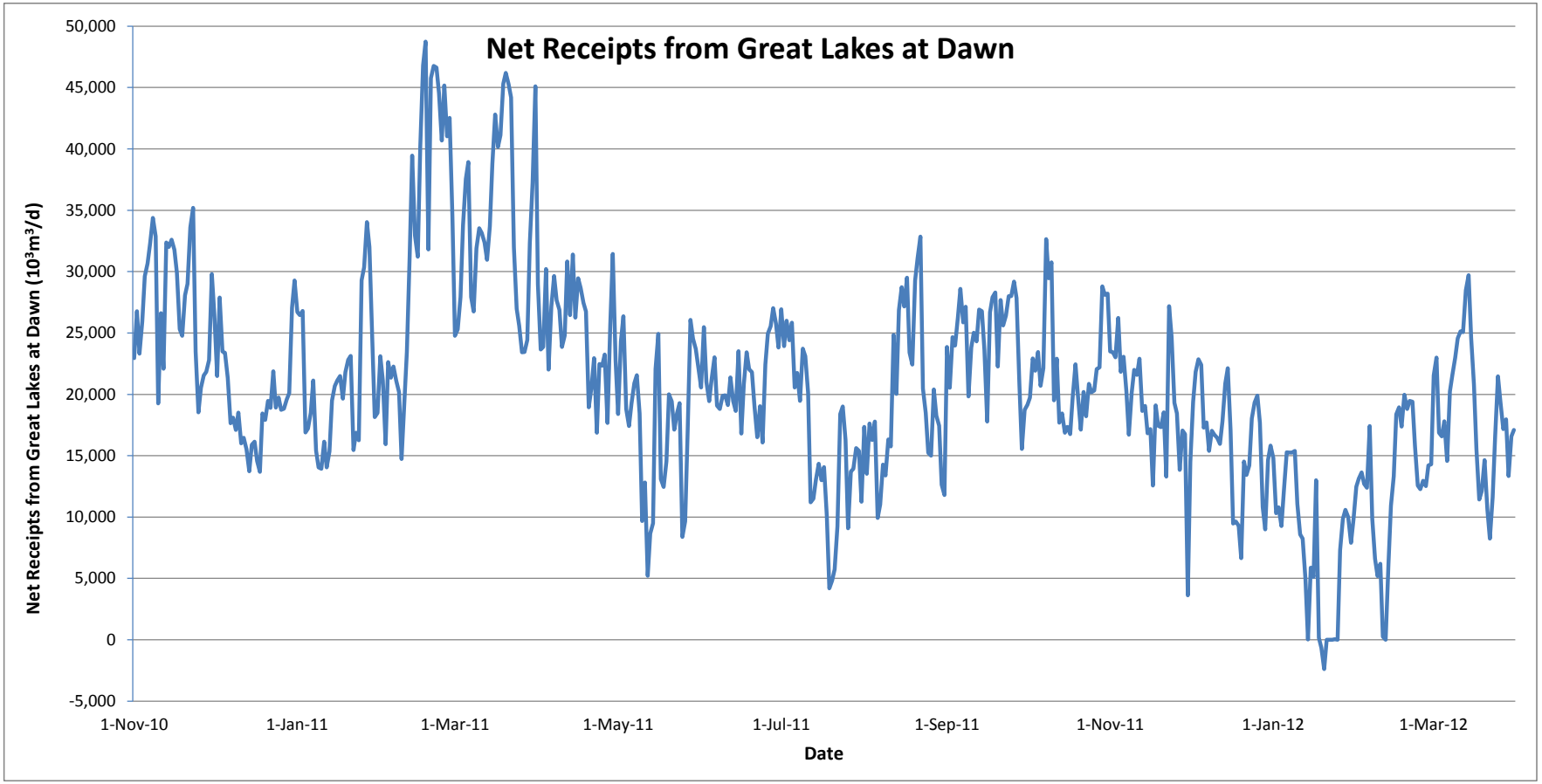
a) Confirmed.

b) Please see the response at Exhibit J.B-8-10-3 a) and b).

c) No.

d) Please see Attachment 1.

e) Union has not included any additional revenues associated with this expenditure.


Net Receipts from Great Lakes at Dawn
Net Receipts from Great Lakes at Dawn (10³m³/d)
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
-5,000
1-Nov-10
1-Jan-11
1-Mar-11
1-May-11
1-Jul-11
1-Sep-11
1-Nov-11
1-Jan-12
1-Mar-12
Date

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference: Exhibit B1, Tab 6, Page 20

Union indicates that $12.3 million is required for several storage projects with each project less than $1 million, and further indicates that these expenditures will help ensure safety, integrity and reliability.

a) Please indicate if any of these expenditures will also result in increased deliverability or increased storage space and if so by how much. Explain.

b) Union notes that this expenditure will among other things include integrity work. Please explain if any of this work is already covered Table B2 Tab 6, also how this integrity work is different than the integrity work in Table 1.

---

**Response:**

a) These expenditures will not result in increased deliverability or increased storage space.

b) The work included in the $12.3 million is not covered as part of the Integrity Management Programs ("IMP") identified at Exhibit B1, Tab 6. The IMP expenditures include work that is investigative in nature and is completed on an ongoing basis.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference**:** Exhibit B1, Tab 9 Exhibit A2, Tab 1, Schedule 1, Page 2

Union indicates that it is planning on spending $215 million from 2012 to 2014 to develop an LCU compressor at Parkway West. Union notes that no incremental revenue is associated with this expenditure. This will provide back-up coverage for a potential loss at:

| | |
|---|---|
| Parkway A (24,000 HP) that provides | 1.0 PJ/d of compression, or |
| Parkway B (47,000 HP) that provides | 1.8 PJ/d of compression. |
| Total | 2.8 PJ/d |

Union also notes that it is contracted to provide firm service to:

| | |
|---|---|
| Enbridge | 1.6 PJ/d, and |
| TransCanada | 2.0 PJ/d |
| Total | 3.6 PJ/d |

Union has also indicated in the second reference above that there has been M12 turnback capacity of 67,000 GJ/d for 2013 and a total of 576,973 GJ/d is at risk of turnback between 2014 and 2018.

APPrO would like to better understand the volume flows and capability in and around Parkway, the need for LCU, the risks of potential failures at Parkway, alternative options considered in lieu of an LCU unit, and cost and benefits associated with this planned expenditure.

a) The Need for LCU

At B1, Tab 9, Page 3, Union states that *"The increase in design day and peak day send out through Parkway compression (today and forecast) and the shift to year-round exports through Parkway compression makes LCU protection at Parkway critical."*

i. Please explain the difference between 'design day' and 'peak day' sendout.

ii. Union indicates at A2 Tab1 Schedule 1 Table 4, that 1.86 PG/d of turnback capacity is at risk to 2018. In light of this risk highlighted by Union, how is adding compression LCU capability consistent with the risk of turnback capacity?

iii. Please provide records of correspondence or meeting minutes where shippers on Union have specifically expressed the concern that Union lacks LCU service at Parkway.

b) Union indicates at B1 Tab 9, page 4 that: "*An outage of the Dawn-Parkway system interconnection at Parkway (including the valve site) would result in no gas being delivered to Parkway (Consumers) and Lisgar"*.

i. Please indicate if the potential loss of deliveries at each of these two locations is the result of a compressor failure (i.e. an actual loss of a critical unit) or the loss of the valve site. If the latter, does Union not have many loads or interconnections that are fed from a single valve site?

ii. In the event of an actual compressor failure, does Union have the capability to 'bypass' the compressor unit to 'freeflow' gas at the Parkway suction pressure to the discharge piping to allow some flow to feed into the downstream systems? If so, how much?

iii. Please provide a schematic to show how the feed to Lisgar is routed in, around or through Parkway.

iv. Does Union use the Trafalgar compressor to facilitate deliveries to Lisgar?

c) Volume Flows and Capability

i. Please confirm that the total compression capability exceeds the current contracted capacity by 0.2 PJ/d.

ii. Union also has an obligated delivery at Parkway for certain direct purchase customers. Please indicate how these volumes are integrated into the overall obligations at Parkway.

iii. Union indicates that it does not have 100% LCU coverage at Parkway currently; please indicate how much redundancy currently exists at Parkway taking into account the current surplus capacity? How does this change by 2018 if Union experiences the full turnback noted.

iv. Is the new compressor station at Parkway West intended to cover the loss of one compressor failure at either Parkway A or Parkway B, or is it intended to cover the failure of both compressors?

d) The Risks of Potential Failure at Parkway

i. Union indicates that providing LCU coverage is critical at Parkway. Please provide a list of all the failures that have occurred over the last 3 years at Parkway A and B and include the duration of the outage and the loss of throughput. For each failure indicate if the outage occurred on a design day or within 10% of a design day.

ii. Has Union performed a full engineering risk assessment of potential for failures at the existing Parkway station, if so please provide a copy of such studies.

iii. Please provide a more detailed line diagram that illustrates the current piping configuration at Parkway that illustrates the Dawn-Parkway lines, compression units, and how these interconnect with TCPL & Enbridge currently. Please also provide a second line diagram that illustrates how Parkway West would functionally be integrated into this system.

e) Alternatives Considered

i. Has Union considered alternatives to building the Parkway West station? If so, please provide details on the alternatives considered.

ii. APPrO understands that a portion of the volumes compressed at Parkway are transported by TCPL to delivery points in eastern Canada for domestic and export use. Please indicate if Union considered not providing any LCU coverage and letting shippers replace lost throughput on other pipeline systems feeding their market (APPrO understands that the TCPL Mainline is substantially underutilized from WCSB, and capacity exists via backhaul from Dawn on GLGT to Emerson and then 'around the horn' to eastern Canada).

iii. At D1, Tab 9, Union reserves the full amount of Hagar LNG capability as system integrity space to manage its integrated system. Given the transition of more gas flow from Parkway east and north and the resulting surplus capacity that exists on the TCPL system southwards from Hagar to Parkway, please explain why Hagar LNG could not be used as a partial or full alternative to Parkway West.

iv. Please provide the regas rate at Hagar.

v. Has Union considered offering the LCU protection at Parkway as on an add-on service only and let shippers decide to contract for the service or not? Please explain.

f) Costs and Benefits of the Parkway West Station

i. Union has been delivering volumes to TCPL & Enbridge at Parkway for many years, presumably without 100% LCU coverage. Please indicate why Union is pursuing this LCU development at this point in time.

ii. Will the new Parkway West compressor station provide any additional firm capacity over and above the current contracted firm capacity to TCPL or Enbridge?

iii. Will the new compressor provide any capacity to generate incremental discretionary revenue not otherwise able to be provided by the existing compression? If so please provide Union's forecast for 2013.

iv. What percentage of the existing Dawn-Trafalgar transmission rate base does this proposed investment in Parkway West represent?

v. Please estimate how the M12 rate would change as a result of this $215 million in expenditure related to the proposed Parkway West station once the Parkway West station is operational and the capital cost included in tolls.

vi. What benefit will infranchise customers receive from Parkway West?

g) Rate Design

i. Please describe how Union proposes to recover the costs of the Parkway West compressor station.

ii. Since Parkway West is being constructed to enhance the reliability of service only to those shippers east of Parkway, has Union considered a rate rider that incorporates a 'system reliability exit fee' to recover the costs of Parkway West?

---

**Response:**

a)

i. Union models system capacity based on a "design day" scenario. The "design day" scenario is based on the following assumptions:

- Extreme cold winter day ("Design Day" temperatures)
- Transportation customers nominating their full contracted delivery
- All interruptible volumes off
- Firm supplies into the system only

Additionally, on the Dawn-Parkway system, Union assumes the loss of a compressor unit at the Lobo compressor station.

The "peak day" send-out is the highest actual flow experienced in a given time period.

ii. Union estimates that design day demands for exports through Parkway compression could exceed 3.0 PJ/d by 2015/2016. The additional 1.0 PJ/d of growth beyond 2012 includes TCPL growth of 0.4 PJ/d as a result of the proposed TCPL 2012 Eastern mainline Expansion Project plus additional potential growth of at least 0.6 PJ/d. Although Union expects that turnback will temper the growth on this path, Union expects new demand as customers downstream of Parkway want to access gas supply at Dawn and/or Kirkwall.

iii. No correspondence or meeting minutes exist where shippers have specifically expressed the concern that Union lacks LCU service at Parkway. Enbridge has expressed support for an LCU project at Parkway to increase reliability for deliveries east of Parkway.

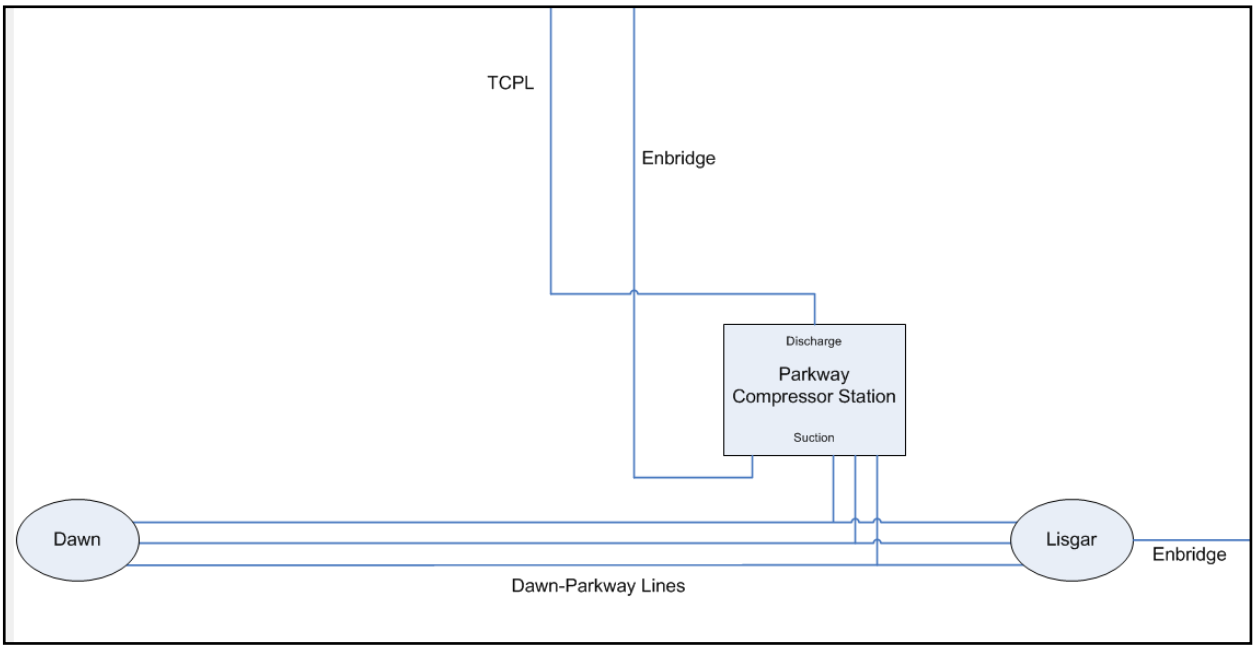
b)

i. Please see response at Exhibit J.B-1-7-13 c). In addition, loss of deliveries at Parkway (Consumers) and Lisgar can also occur if there is an outage of the measurement facilities at the Enbridge connection. A compressor outage may or may not impact deliveries to either Parkway (Consumers) or Lisgar, as those volumes are delivered from the suction side of Parkway compression. Union does not have any other urban centre as large as the GTA served through similar facilities.

ii. Yes. The compressor can be bypassed if downstream pressure conditions allow. The pressure that could be provided to TCPL could not meet the required contracted delivery pressure of 6450 kPag. In this situation Union could deliver pressures as low as 3450 kPag.

Union is not able to predict how TCPL would be able to manage their transmission pipelines with pressures at Parkway significantly lower than their 6450 kPag requirement.

iii.




iv. No. Compression is not required to meet the Lisgar delivery pressure requirements of 3450 kPag. The Trafalgar compressor was retired in March 2012.

c)

i. The compression at Parkway cannot be used in isolation to determine the Dawn to

Parkway capability.

For Winter 12/13 the system capacity exceeds demands by 0.03 PJ/d and for Winter 13/14 0.2 PJ/d

ii. Please see the response at Exhibit J.D-18-9-1 a).

iii. In Winter 13/14, with a Parkway B outage, Union can meet 55% of the design day requirements. With a Parkway A outage, Union can meet 80% of the design day requirements.

There is currently no coverage for the loss of the valve site at Parkway connecting Parkway (Consumers) and Lisgar to the Dawn-Parkway system or loss at the measurement facilities connected to TCPL and Enbridge.

iv. The new compressor at Parkway West is intended to cover the loss of one compressor, either Parkway A or Parkway B but not both.

d)

i. Please see the response at part c) above.

ii. Union has not performed a full engineering risk assessment of the potential for failures at the existing Parkway Compressor Station.

iii. Please see the response at Exhibit J.B-1-1-2 a).

e)

i. Please see the response at Exhibit J.B-1-1-2 a).

ii. Union did not consider letting shippers with firm deliveries at Parkway replace lost throughput on other pipeline systems. An outage during peak demand would have an immediate impact on regional gas flows, specifically deliveries to Enbridge. There would be minimal time to arrange alternate supply in the event of an outage.

iii. The Hagar LNG facility volumes are available to support local industry, including power generation, in the event of a supply short-fall or due to forecast weather variances. The volumes cannot be considered as partial LCU coverage for a Parkway Failure as they may already be in use to support the North prior to a Failure.

iv. The regas rate for Hagar is 90 MMcfd.

v. No. Firm shippers on Union's system do not have the option of contracting for protection currently provided by LCU compression at Dawn and Lobo/Bright nor do shippers have the option of paying for other reliability features inherent in Union's system.

f)

i. Please see the response at Exhibit J.B-1-1-2 a).

ii. Please see the response at Exhibit J.B-1-7-11 a) and Exhibit J.B1-7-10 c).

iii. Please see the response at Exhibit J.B-1-7-11 a).

iv. Please see the response at Exhibit J.B-1-1-2 a).

v. Please see the response at Exhibit J.B-1-7-8 c).

vi. The Parkway West Project will provide increased reliability and security of supply for in-franchise customers located in Union's Northern and Eastern delivery areas who currently, or in the future, rely on flow through Parkway from Dawn and/or Kirkwall. The Parkway West Project will increase the reliability and security of supply for all customers east of Parkway, which increases the value of the Dawn-Parkway system, helps retain existing customers and provides a platform for growth of volumes delivered through Parkway. These factors all contribute to a robust and liquid Dawn Hub and will help mitigate the risk and impacts of turnback of Dawn-Kirkwall and Dawn-Parkway capacity.

g)

i. The Parkway West project is not included in Union's test year cost of service. The cost and rates consequences of the Parkway West project will be brought before the Board in a future application.

ii. Please see the response to g) i) above.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Ref: Exhibit B1, Tab 2
Exhibit B1, Summary Schedule 2

Please provide an exhibit that broadens Table 1 "Capital Budget Summary by Function" at page 1 of Exhibit B1, Tab 2 to include, prior to the column entitled "Actual 2007", a column showing the capital budget Union proposed in EB-2005-0520 referenced at Exhibit B1, Tab 2, page 2 for each of the line items 1 to 9 inclusive in Table 1, followed by the Actual Amounts for 2007 shown in Column (a) of Table 1, and then followed by 2 new columns not now in Table 1 showing Actual Expenditures for 2008 and 2009; and then followed by Columns (b) to (e) inclusive of Table 1 for 2010 to 2013 inclusive.

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**Response:**

Please see the response at Exhibit J.B-1-2-2.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Ref: Exhibit B1, Tab 2
Exhibit B1, Summary Schedule 2

If Union adopted internally a revised Capital Budget for 2007 to reflect the settlement of the Rate Base amount in that proceeding, then please provide a schedule that will show the extent to which the Capital Budget, presented for approval in EB-2005-0520, was reduced to reflect that settlement.

---

**Response:**

| Line No. | Particulars ($ millions) | Proposed 2007 Budget EB-2005-0520 (a) | Board-approved 2007 (b) |
|---|---|---|---|
| 1 | Storage | 10.0 | 10.0 |
| 2 | Transmission | 139.1 | 139.1 |
| 3 | Distribution | 89.6 | 89.6 |
| 4 | General | 50.0 | 50.0 |
| 5 | Overhead | 59.3 | 59.3 |
| 6 | Total | 348.0 | 348.0 |
| 7 | Rate Base Reduction via ADR | | (35.0) |
| 8 | | | 313.0 |

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Ref: Exhibit B1, Tab 2
Exhibit B1, Summary Schedule 2

Please provide an exhibit that:

a) Broadens Table 2 of Exhibit B1, Tab 2 "Capital Budget Summary Year-Over-Year Change by Function" to add Actual columns for 2007, 2008 and 2009, and expands the year-over-year change by function analysis to include:

   i. 2007 Actual Spend compared to 2007 Capital Budget presented in EB-2005-0520,

   ii. 2008 Capital Spend compared to 2007 Capital Spend,

   iii. 2009 Capital Spend compared to 2008 Capital Spend,

   iv. 2010 Capital Spend compared to 2009 Capital Spend,

   and so on through to proposed Capital Spend for 2013 as shown in Table 2.

---

**Response:**

a) Please see Attachment 1.

# Capital Budget Summary Year-Over-Year Change by Function

| Description ($Million's) | Actual 2007 (a) | Actual 2008 (b) | Actual 2009 (c) | Actual 2010 (d) | Actual 2011 (e) | Forecast 2012 (f ) | Forecast 2013 (g) |
|---|---|---|---|---|---|---|---|
| Proposed 2007 Budget EB-2005-0520 | 348.0 | | | | | | |
| Prior Period | | 342.7 | 295.8 | 224.0 | 219.6 | 274.5 | 275.1 |
| Storage | (2.8) | 1.6 | (4.8) | 13.9 | 19.0 | (22.6) | (0.8) |
| Transmission | 20.0 | (74.8) | (41.6) | (17.6) | 23.2 | (0.3) | 66.1 |
| Distribution | 4.1 | 19.4 | (17.6) | 6.3 | 10.5 | 13.6 | 29.9 |
| General | (20.5) | 1.4 | (7.3) | 9.2 | 6.2 | (1.4) | 0.8 |
| Overhead | (3.2) | 5.2 | (1.7) | (10.5) | 3.3 | 2.3 | (0.4) |
| Sub-Total: Change in Spend by Function | (2.4) | (47.2) | (73.0) | 1.3 | 62.2 | (8.3) | 95.6 |
| Adjustment: Change in Unregulated Projects | (2.9) | 0.3 | 1.2 | (5.7) | (7.3) | 8.9 | 1.0 |
| Sub-Total: Change in Spend for Regulated Projects | (5.3) | (46.9) | (71.8) | (4.4) | 54.9 | 0.6 | 96.6 |
| Current Period | 342.7 | 295.8 | 224.0 | 219.6 | 274.5 | 275.1 | 371.7 |

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Ref: Exhibit B1, Tab 2
Exhibit B1, Summary Schedule 2

Please include with the previous exhibit "Variance Explanations" for:

a) 2007 Actuals versus 2007 Budget presented in EB-2005-0520;

b) 2008 Actuals versus 2007 Actuals;

c) 2009 Actuals versus 2008 Actuals; and

d) 2010 Actuals versus 2009 Actuals.

---

**Response:**

a) 2007 Actual vs. 2007 Budget

Capital investment in 2007 was $5.3 million less than the 2007 budget proposed in EB-2005-0520. The decrease is related to several projects with lower than budgeted expenditures including Gas Distribution Access Rules project, ITE project, Head Office Replacements project, partially offset by higher than budgeted expenditures for the Parkway B Compressor project.

b) 2008 Actual vs. 2007 Actual

Capital investment in 2008 was $46.9 million less than 2007 actual expenditures. The decrease is primarily due to the Parkway B Compressor project, the Dawn-Parkway System (Strathroy to Lobo) project and the St. Clair Energy Centre which were constructed and placed into service in 2007. These decreases were partially offset by increases related to the Dawn-Trafalgar System-Bright project, new service centre projects in Windsor, Kingston, and the East Windsor Cogen project.

c) 2009 Actual vs. 2008 Actual

Capital Investment in 2009 was $71.8 million less than 2008 actual expenditures. The decrease is primarily a result of the completion of the Dawn-Parkway System (Bright), Burlington Service Centre, and the Windsor Cogen projects and Transportation Replacements. These decreases were partially offset by increases related to the West GTA (Halton Hills) project, and the Fort Francis Replacement project.

d) 2010 Actual vs. 2009 Actual

Capital Investment in 2010 was $4.4 million less than 2009 actual expenditures. The decrease is primarily due to the completion of the West GTA (Halton Hills), Kingston Service Centre, Windsor Service Centre, and Dawn-Parkway System (Bright) projects. These decreases were partially offset by increases in the Dawn J, Dawn-TCPL Westerly, Lobo A & B projects, and Transportation Replacements.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Ref: Exhibit B1, Tab 2
Exhibit B1, Summary Schedule 2

Please provide an exhibit that broadens Exhibit B1, Summary Schedule 2 to include the following:

a) Details of Capital Expenditure and Justification for Projects over $500,000 proposed in EB-2005-0520; followed by;

b) Amounts shown in Exhibit B1, Summary Schedule 2 for "Actual 2007" for "Regulated" and "Total"; followed by;

c) Information to be added for Actual 2008 and 2009 for "Regulated" and "Total"; followed by:

d) Amounts that appear for 2010, 2011, 2012 and 2013 in Exhibit B1, Summary Schedule 2.

---

**Response:**

a) Please see Attachment 1.

b) to d) Please see Attachment 2.

UNION GAS LIMITED

Details of Capital Expenditures and Justification for Projects in excess of $500,000

Calendar Year Ending December 31, 2004 - 2007

Includes IDC

($000's)

| Line No. | Function | Board Approved 2004 | Actual 2004 | Forecast 2005 | Forecast 2006 | Forecast 2007 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|
| | Storage | | | | | | | |
| 1 | Dawn Plant F Compressor | | | 5,240 | 28,714 | | November 1, 2006 | This project forms part of the Dawn-Trafalgar Facilities Expansion Program (2006 - 2007 winter), which allows for the incremental expansion of system capacity by adding pipeline sections and compression capability, as required, to meet growth in market demand. (PI = 0.83) |
| 2 | Dawn Dehydration | | | | | 5,248 | November 1, 2007 | Represents the cost to install back-up components and replacement of elements critical to the dehydration system to ensure system integrity and reliability. |
| 3 | Gas Chromatographs | 2,000 | 1,825 | 719 | | | June 1, 2005 | Represents the costs required to install gas chromatographs at each storage pool, to provide accurate real time assessment of all of the gas being injected and withdrawn from each storage pool. |
| 4 | Dawn 47-49 Line Upgrade | | | 2,443 | | | July 30, 2005 | Represents the costs associated with the size-for-size replacement of the Dawn 47-49 storage pipeline to meet increased operating pressures. (PI = 2.11) |
| 5 | Dawn G Gas Generator Overhaul | | | | | 1,604 | August 1, 2007 | The gas generator engine is expected to approach 24,000 operating hours in 2007. In accordance with the manufacturer's recommendations and industry practice, the engine is due for a strip down, inspection and overhaul/repair. |
| 6 | Well Security Deposit | | | | 1,279 | | February 28, 2006 | To comply with the Ministry of Natural Resources changes to the Oil, Gas and Salt Regulations. The changes are a result of the Province's new policy relating to security deposits for oil and gas wells. |
| 7 | Hagar Boil-off Compressor | | | | 1,226 | | September 1, 2006 | Installation of an auxilliary compressor unit at Hagar to supplement the flow capacity and reduce gas emissions. |
| 8 | Dawn Plant D&E Exhaust Replacement | | | | | 1,006 | September 1, 2007 | The existing exhaust silencer dates back to 1988/89 and is degrading in quality and effectiveness due to usage. Once the silencer has degraded to a certain point, it is no longer effective in noise reduction. |
| 9 | Hagar APU Generator | | | | 1,005 | | August 1, 2006 | The cost to purchase and install a 1200 kW diesel back-up electrical powered generator at the Hagar LNG Plant, thereby replacing the current generators, identified as deficient by the local electrical inspector. |
| 10 | Plant "A" Lean Burn Conversion | | | 757 | | | April 1, 2005 | Represents expenditures related to converting the Dawn TLA 10-1 engine to lean burn in order to meet the legislative requirements regarding NOx emissions (Ministry of the Environment O. Regulation 346). |
| 11 | Storage Projects listed above | $ 2,000 | $ 1,825 | $ 9,159 | $ 32,224 | $ 7,858 | | |
| 12 | Storage Projects less than $500,000 | 1,684 | 1,020 | 2,978 | 1,562 | 2,166 | | |
| 13 | | $ 3,684 | $ 2,845 | $ 12,137 | $ 33,786 | $ 10,024 | | |

UNION GAS LIMITED
Details of Capital Expenditures and Justification for Projects in excess of $500,000
Calendar Year Ending December 31, 2004 - 2007
Includes IDC
($000's)

| Line No. | Function | Board Approved 2004 | Actual 2004 | Forecast 2005 | Forecast 2006 | Forecast 2007 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|
| | Transmission | | | | | | | |
| 14 | Dawn-Trafalgar System - Hamilton to Milton | | | 7,900 | 54,191 | 1,409 | November 1, 2006 | In order to meet forecast customer demands for the 2006 - 2007 winter, the Hamilton to Milton pipeline facilities are required. This represents the cost of constructing these new facilities. (PI = 0.83) |
| 15 | Dawn-Trafalgar System - Strathroy to Lobo | | | | 3,282 | 48,481 | November 1, 2007 | This is the 2nd stage of the project. Current demands are being met by existing facilities, but these will be inadequate to meet demands in the future based on the number of forecasted new customers. Phase 2 will be necessary to service new customers added in late 2007. (see Parkway B Compressor below) |
| 16 | Parkway B Compressor | | | | 8,666 | 39,761 | November 1, 2007 | This is the 2nd stage of the project. Current demands are being met by existing facilities, but these will be inadequate to meet demands in the future based on the number of forecasted new customers. Phase 2 will be necessary to service new customers added in late 2007. |
| 17 | Dawn-Trafalgar System - Brooke to Strathroy | | | 934 | 43,840 | 1,012 | November 1, 2006 | In order to meet forecast customer demands over the 2006 - 2007 winter, additional facilities are required. This represents the cost of obtaining these new facilities. (PI = 0.83) |
| 18 | Integrity Management Program | 8,510 | 7,095 | 7,805 | 8,086 | 8,086 | Ongoing | Represents the continuation of a multi-year program to improve pipeline reliability and system performance while meeting all of the requirements of the NEB and TSSA Regulations. Dollars spent are focused on condition monitoring and remediation and risk reduction. |
| 19 | Dawn-Trafalgar System Replacements - Hwy 25 & Tremaine | 9,446 | | | | 2,028 | August 1, 2007 | The work is due to class location changes and involves installing crack arrestors and replacing all current and future road crossing areas. The pipelines will also be hydrostatically tested. |
| 20 | St. Clair Energy Centre | | | | 1,559 | 9,605 | September 1, 2007 | A new power generation facility is being built in the Sarnia-Lambton area. In order to serve this plant, Union must build new facilities, as existing facilities cannot serve the incremental demand. (PI = 2.89) |
| 21 | Odourant / Containment | 1,500 | 1,860 | 1,500 | 2,000 | 3,000 | Ongoing | Represents the continuation of multi-year program to rebuild odourant systems to reduce risk of spills and minimize negative consequences in the event that a spill happens. |
| 22 | Bright C Compressor | | | | 224 | 8,283 | November 1, 2008 | This is Phase 3 of the project. Current needs are being met by existing facilities. Customers have signed contracts for November 2006 which instigated Phase 1, and additional customers have responded to the 2007 Open Season for service beginning in November of 2007, which will drive the need for Phase 2 of the project. Additional customers in 2008 will necessitate the commencement of Phase 3 of the project. |
| 23 | Greenfield Energy Centre | | | | 705 | 6,334 | September 1, 2007 | A new power generation facility is being built in the Sarnia-Lambton area. In order to serve this plant, Union must build additional facilities, as existing facilities cannot serve the incremental demand. (PI = 10.14) |
| 24 | Guelph Transmission Reinforcement | 3,127 | 2,113 | | | | October 12, 2004 | Represents the cost of 7.5 km. of NPS 12 to loop the existing NPS 10 line due to general growth on the Guelph system. |
| 25 | Owen Sound East Hwy 26 | 509 | | 4,568 | | | August 31, 2005 | This represents the cost of upsizing 14 kms. of pipe from Owen Sound to Meaford as a result of changes to the MTO's 2005 summer road construction plan. This is the most efficient/economic method of continuing to meet customer needs for the next 10 years, as it will defer the need for cut-outs and future looping of a section of the East Owen Sound pipeline. |
| 26 | Toyota Plant | | | | 4,299 | | October 1, 2006 | Facilities are required to serve a new Toyota plant in the Woodstock area. (PI = 1.00) |
| 27 | Avon Gas Generator and Power Turbines | | 4,040 | | | | October 1, 2004 | The cost of upgrading the engines and power turbines at the Lobo and Bright Compressor Stations after a major failure occurred in December of 2003. |

UNION GAS LIMITED

Details of Capital Expenditures and Justification for Projects in excess of $500,000

Calendar Year Ending December 31, 2004 - 2007

Includes IDC

($000's)

| Line No. | Function | Board Approved 2004 | Actual 2004 | Forecast 2005 | Forecast 2006 | Forecast 2007 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|
| 28 | London North Line Looping | | | | | 3,735 | July 1, 2007 | To meet continuing growth in the City of London, the London North Line requires reinforcement. Facilities will be in service for the 2007/2008 winter. |
| 29 | Vector Interconnect with SIL | | | 3,394 | | | December 1, 2005 | Represents costs to construct facilities for a new interconnect between the Vector pipeline and the Sarnia Industrial System near the existing Courtright Station to improve security of supply into Union's system. |
| 30 | Lobo Noise Reduction | | | 1,570 | 1,207 | | September 1, 2006 | Noise levels around the Lobo Compressor Station exceed Ministry of Environment noise emission guidelines. The existing equipment does not meet current emission requirements. The costs here represent replacement of the Plant A Exhaust Silencers in 2005 and replacement of the inlet filters in 2006. |
| 31 | Class Location Upgrades | | | | | 2,000 | October 31, 2007 | This is a blanket submission for class location changes within the transmission system. The intent is to allow the required upgrades to receive more immediate attention. Projects will be coordinated by Union's Operations department and will be prioritized and funding allocated on a yearly basis as required. |
| 32 | Sarnia Area Expansion | | | 1,931 | 727 | | Jan. 1 & June 1, 2006 | Represents costs to construct facilities to meet the needs of a Hydrogen Plant (Jan. 2006) and Ethanol Plant (June 2006) in the Sarnia area. |
| 33 | Owen Sound Line Reinforcement | | | | 1,826 | | September 30, 2006 | Reinforcement of the Owen Sound Transmission System is required to meet forecasted growth north of St. Jacobs. Union will install 7.4 km of NPS 12 in 2006 from Drayton to Teviotdale. |
| 34 | Bright A Noise Reduction | | | | | 1,628 | September 1, 2007 | In 2007, the two existing exhaust silencers will be replaced. In 2008, the two existing inlet air filters will be replaced. Similar replacements are proposed for 2005 and 2006 at the Lobo Compressor Station. |
| 35 | Hensall Phase IV | | | 1,367 | | | November 1, 2005 | Represents the cost of increasing capacity to maintain minimum pressures into Goderich Gate and Teeswater Gate Stations on a design day (44 degree day) in the winter of 2005/2006. The increase in demand due to new customer attachments is driving the requirement for this project. |
| 36 | Lobo B Gas Generator Overhaul | | 706 | | | | March 31, 2005 | This represents the costs incurred for the internal inspection and overhaul of a gas generator in order to avoid future breakdown. The overhaul relates to reliability and efficiency and to prevent future damage to the unit (preventative maintenance). |
| 37 | Dawn-Trafalgar System Replacements -Ayr Road | | | | | 654 | October 1, 2007 | Development near the Owen Sound Take-off Valve site has triggered a class change that requires line replacement, hydrostatic testing and installation of crack arrestors. Failing to implement this project would result in decreased pressure ratings, and the inability of Union to meet its existing contractual obligations. |
| 38 | Lobo B Silencer Replacement | | | | | 503 | September 1, 2007 | This project is to replace the exhaust silencer on the Lobo B Plant. The existing silencer has degraded over time. The replacement is necessary to meet noise emission requirements. |
| 39 | Bright B Silencer Replacement | | | | | 503 | September 1, 2007 | This project is to replace the exhaust silencer on the Lobo B Plant. The existing silencer has degraded over time. The replacement is necessary to meet noise emission requirements. |
| 40 | Transmission Projects listed above | $ 23,092 | $ 15,814 | $ 30,969 | $ 130,612 | $ 137,022 | | |
| 41 | Transmission Projects less than $500,000 | 804 | 2,957 | 3,170 | 1,691 | 2,099 | | |
| 42 | | $ 23,896 | $ 18,771 | $ 34,139 | $ 132,303 | $ 139,121 | | |

UNION GAS LIMITED

Details of Capital Expenditures and Justification for Projects in excess of $500,000

Calendar Year Ending December 31, 2004 - 2007

Includes IDC

($000's)

| Line No. | Function | Board Approved 2004 | Actual 2004 | Forecast 2005 | Forecast 2006 | Forecast 2007 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|
| | Distribution | | | | | | | |
| 43 | New Business Portfolio | 43,058 | 37,616 | 35,255 | 39,578 | 34,982 | ongoing | Represents the costs incurred to attach the forecasted customer additions. Individual project economics are produced for each project before the actual expenditure is undertaken. |
| 45 | Meter and Regulator Replacements | 8,269 | 6,208 | 8,722 | 10,384 | 10,883 | ongoing | Represents the replacement of meters and regulators that have reached the end of their life. They are replaced to meet Measurement Canada accuracy standards. |
| 46 | Main Replacement - municipal roadwork / leakage | 5,411 | 3,583 | 5,307 | 5,830 | 8,146 | ongoing | Represents the replacement of main due to age and condition as well as municipal roadwork. Risk based assessment is done to determine which lines to replace for age and condition. |
| 47 | Service Replacements | 1,796 | 959 | 1,858 | 2,166 | 2,199 | ongoing | Represents the replacement of services due to age and condition of municipal roadwork, main replacement and plant improvements. Risk based assessment is done to determine which services to replace for age and condition. |
| 48 | Specified Projects | | | | | | | |
| 49 | OPG - Thunder Bay | | | 1,412 | 15,249 | 1,464 | March 1, 2007 | Facilities include 32km of NPS 12 main from TCPL facilities to the power generation site; upgrade Belrose and Onion Lake Station, 855 of NPS 16 or NPS 20 and the installation of a customer station. (PI = 1.00) |
| 50 | Inside Meter/Reg Relocation | | | 2,421 | 3,606 | | January 1, 2006 | Where the service is operating at a pressure greater than 2.5 kPa inside a building with inside regulation, this project includes the relocation of the regulator to the outside of the building. |
| 51 | Non Standard Stn Filter Upgrade | | | 1,100 | 1,100 | 1,100 | ongoing | Project requires the installation of new upstream filters at major industrial customers in the Northern areas to be consistent with our customer station design standards. |
| 52 | Hwy 518 Relocation Phase II - Parry Sound | | | | 2,976 | | September 30, 2006 | Costs to relocate the Parry Sound Lateral as required by the original Encroachment Agreement with the MTO as a result of road reconstruction on Hwy 518. |
| 53 | Valve Installation - various locations | 361 | 90 | 1,110 | 671 | 970 | ongoing | Installing new valves at specific district locations to comply with the distribution valve policy and the standard operating practice for valve maintenance. |
| 54 | Leamington Line to Wheatley Replacement | | | | 2,016 | 1,973 | September 30, 2006 | Replacement of 27km of NPS 6 line operating with a MOP of 620 kPa on the Leamington Line from Stevenson Road in Wheatley to the east side Leamington with NPS 8 3450 MAOP pipe. |
| 55 | Kingston - Bath Backfeed Reinforcement | | | | | 2,007 | September 1, 2007 | Currently the Kingston township system is a single feed which is a 6895 kPa MOP NPS 6 line, installed in 1966. It has reached its practical capacity and has resulted in lower than design inlet pressures to Woodbine TBS. This project will install approx. 4 km of NPS 8 ST main and a new station on Taylor Kidd Rd. |
| 56 | Bruce Ave Low Pressure - Phase 5 & 6 | 763 | 708 | 910 | | | November 30, 2005 | Represents the cost to complete the fifth and sixth phase of the 6 year Bare Main Initiative to replace the low pressure mains in the Windsor downtown core. |
| 57 | Lasalle TBS Replacement/Relocation - Sudbury | | | | 1,485 | | September 30, 2006 | Represents costs of relocations due to road widening as well as continued growth in both the number of commericial and residential customers. Will tie the new TBS to the existing Lasalle high pressure system ("HPS"). Addresses the capacity, growth, mains, minicipal and operational concerns of the Lasalle TBS and HPS. |
| 58 | Burlington South Reinforcement | | | 1,150 | 1,208 | | December 31, 2006 | The 2003 Burlington/Oakville Facilities Business Plan forecasted substantial industrial growth along North Service Road in Burlington. This project will install NPS 8 HP ST along North Service Rd and NPS 6 HP ST Walkers Line. |
| 59 | Sudbury Property Line PRS Removal | | | 291 | 354 | 603 | September 30, 2007 | The removal of property line regulator stations is required due to years of growth in the Sudbury area. This is the third year of a 4 year project. |

UNION GAS LIMITED
Details of Capital Expenditures and Justification for Projects in excess of $500,000
Calendar Year Ending December 31, 2004 - 2007
Includes IDC
($000's)

| Line No. | Function | Board Approved 2004 | Actual 2004 | Forecast 2005 | Forecast 2006 | Forecast 2007 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|
| 60 | Windsor Dist. Ops Academy LP Phase 1 | | | | | 1,179 | September 30, 2007 | This is the first phase in the replacement of a large low pressure (LP) area in South Windsor. There are over 1,100 homes currently fed by an LP system that will be converted to IP pressure. |
| 61 | London - Commissioners Rd West Widening | 931 | | | 913 | | November 30, 2006 | Due to municipal road widening, the project will replace main along Commissioners Rd West between Viscount Rd and Wonderland Road. |
| 62 | DIGR Backlog | | | | 900 | | December 31, 2006 | Identify and complete all outstanding and missing initial inspections (DIGR/C's) from July 1st, 2001 to present as required by Ontario Regulation 212/01. |
| 63 | Hearst TBS Replacement | 562 | 481 | | | | December 23, 2004 | Represents the cost to relocate and reconstruct a station in the town of Hearst due to age and condition. |
| 64 | Guelph Road - Municipal Project | 504 | | | | | | This project was cancelled due to a change in the municipality's plan. |
| 65 | District Station Electrical upgrades | | | 900 | | | ongoing | Electrical upgrades at stations identified having code compliance issues. |
| 66 | North Service Rd. & Royal Windsor Dr. Oakville | | | | | 835 | July 30, 2007 | Due to road reconstruction, Union will be required to replace & relocated various main segments. |
| 67 | Winston Churchill (No 5 SDRD-No 10 SDRD) | | | | | 825 | December 31, 2007 | Due to road reconstruction, Union will be required to replace & relocated various main segments. |
| 68 | Dundas Street - Walkers Line to Appleby Line | | | | 765 | | June 30, 2006 | Due to road reconstruction, Union will be required to replace & relocated various main segments. |
| 69 | Rebecca St. (Burloak Dr. to Mississauga St) | | | | 711 | | August 30, 2006 | Due to road reconstruction, Union will be required to replace & relocate various mains. |
| 70 | London - Old South LP Replacement | | | | 650 | 1,049 | August 31, 2006 & 2007 | This project includes the first and second phase of LP main replacement on the London Old South system. |
| 71 | Chatham - Dominion Replacement | | | | 617 | | August 31, 2006 | This project includes the replacement of 2.3 km of NPS 12 near Highgate with NPS 8 pipe. This is the only section of bare pipe remaining on the Dominion Line and is being replaced due to age and condition. |
| 72 | Leamington LP Replacement | | | | 582 | | June 30, 2006 | This project includes replacement of approximately 45 km of LP main in Leamington. The project is required to address age and condition, municipal conflicts, and a few indoor meters. |
| 73 | Winston Churchill Relocate - Oakville | | | | 528 | | December 31, 2006 | Due to road widening, Union will be required to replace and relocate 1.1 km of NPS 8 ST HP. |
| 74 | Distribution Integrity Management | | | | | 500 | November 1, 2007 | Development of an integrity management program related to the distribution portion of the pipeline systems, and assessment of the condition of the selected facilities and associated remediation on a prioritized basis. |
| 75 | Service Tee Quality Control | | | | | 500 | January 1, 2007 | Additional testing of tees installed by each fuser. This is for quality control purposes and to audit conformance with Union's fusion standards. |
| 76 | Distribution Projects listed above | $ 61,655 | $ 49,645 | $ 60,436 | $ 92,289 | $ 69,215 | | |
| 77 | Distribution Projects less than $500,000 | 10,991 | 9,734 | 22,097 | 22,748 | 20,350 | | |
| 78 | | $ 72,646 | $ 59,379 | $ 82,533 | $ 115,037 | $ 89,565 | | |
| 79 | Customer Attachments | | 31,415 | 30,396 | 28,287 | 24,409 | | |

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| Line No. | Function | Board Approved 2004 | Actual 2004 | Forecast 2005 | Forecast 2006 | Forecast 2007 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|
| | General | | | | | | | |
| 80 | Transportation Replacements | 3,000 | 3,178 | 5,271 | 7,097 | 8,818 | ongoing | Represents the cost of the recommended vehicle and equipment replacements based on the corporate replacement policy. |
| 81 | ITE Project | 4,046 | 4,024 | 7,314 | 2,661 | 7,670 | ongoing | Represents the cost of delivering computer related infrastructure for Union. Spending on Information Technology will replace obsolete equipment and upgrade hardware on existing machines to extend their useful lives. |
| 82 | Gas Distribution Access Rules | 1,991 | 1,577 | 1,500 | 10,100 | 8,100 | January 1, 2007 | This represents the cost of IT technology required to implement the final phase of the GDAR. The in-service date for EBT standards and rate-ready ABC service for large volume customers is January 1, 2007 and the bill-ready service is January 1, 2008. |
| 83 | Load Balancing | 2,780 | 1,746 | | | | July 1, 2004 | This represents the IT costs involved in changing the way Union tracks and charges for load balancing costs for the Bundled-T service. The project will reduce Union's cash flow risk, UDC, cost disallowance and eliminate retro-active balancing charges. |
| 84 | Replace RM/MC Software | | | | 3,160 | 610 | January 1, 2007 | The Resource Management/Mobile Client software is nearing the end of its life cycle and the manufacturer is no longer developing enhancements for this product. The new software (MDSI) will have the functionality to book appointments and schedule multi-rep and multi-day work; this will enhance productivity and client service. |
| 85 | Head Office Replacements | | | | 1,750 | 1,830 | throughout 2006 & 2007 | This represents the cost of products and services to enhance the performance of Union's facilities in response to safety, environmental, and life-cycle activities. |
| 86 | Automate S&T processes | | | 700 | 2,200 | | December 31, 2006 | This project will automate the Storage & Transmission processes. The automation is necessary to address audit concerns to improve internal controls over S&T revenues. S&T billings are approximately $200M annually. The use of spreadsheets and Access billing will be eliminated. |
| 87 | CARE Compliance/Product Development | | | 700 | 500 | 1,250 | Dec.31, 2006 & 2007 | This represents the cost of modifications to Gas Nominations CARE application. The modifications are needed to meet internal business requirements and comply with external reporting requirements. These include upstream pipeline requirements, automating billing and tracking, nominated vs. scheduled gas quantities. |
| 88 | Panasonic Lease | | | | 2,115 | | January 31, 2006 | In January 2001, Union entered into a 9-year elase for the acquisition of 272 field laptop computers, field radio equipment and services required to implement this equipment. The $2.1 million is required to replace the 272 laptops as they will have reached the end of their life cycle. |
| 89 | Banner Enhancement - Rate Rider | | | 2,125 | | | April 1, 2006 | This represents costs associated with the introduction of the ability to bill rate rider for commodity, delivery, transportation and storage. Currently short term rate adjustments are rolled into the current rate and then reversed at the end of the term. Once the project is complete, the rate adjustment will be shown as a separate item on each bill. |
| 90 | GIS Upgrade Phase 1 | | | | | 1,000 | throughout 2007 | The current product is obsolete and the vendor is no longer supporting or enhancing the product. This project is to provide additional internal resources to support and upgrade the system. Failing to do so will result in returning to paper mapping, which is not a feasible option. |
| 91 | Business Continuity Plan | | | | 575 | 470 | Dec.31, 2006 & 2007 | To address issues identified in the IS/ITI infrastructure and processes in order to have a responsive, executable plan that supports the business' recovery needs. |
| 92 | CARE Reliability | | | | 800 | 900 | Dec.31, 2006 & 2007 | This represents the cost of hiring external contractors to assist with the critical problem of dealing with the "must do" CARE items. These items cannot be supported by the existing IS complement. |

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| Line No. | Function | Board Approved 2004 | Actual 2004 | Forecast 2005 | Forecast 2006 | Forecast 2007 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|
| 93 | Tracking Gas Acquisitions | | | 850 | 500 | 300 | Dec.31, 2006 & 2007 | This project will automate the manual tracking process for gas acquisitions/ improve internal controls, increase efficiencies, reduced errors and duplication of efforts and improved timeliness of information. |
| 94 | Operations Compliance | | | 500 | 500 | 400 | throughout each year | This project will allow IT to develop solutions for various compliance related matters without impacting existing projects. |
| 95 | ConTrax Compliance | | | | | 1,450 | December 1, 2007 | System and process changes as a result of future audit compliance requirements. |
| 96 | Unionline/Care/Contrax | | 656 | 750 | | | Dec.31, 2005 & 2006 | This represents the cost of hiring external contractors to assist with the critical problem of dealing with the "must do" CARE/Contrax/Unionline items. These items cannot be supported by the existing IS complement thus, external resources are required. This spending is critical and relates to safety, reliability and compliance type issues. |
| 97 | Measurement System Replacement | 745 | | 600 | | | December 31, 2006 | This represents the costs associated with implementing the new GMAS system (Gas Measurement System) being implemented across all of Duke Energy. Implementation of the system will allow Union to provide more reliable Measurement Volumes for customers and eliminate the risks associated with the current manual and spreadsheet driven process. |
| 98 | IVR Replacement | | | | | 1,100 | December 31, 2007 | The existing IVR system is reaching the end of its life. The vendor is starting to curtail system support in 2006 and will no longer offer support in 2008. The new system will have improved functionality and handle a greater number of incoming calls. The increased capacity will benefit Union and its clients in future years as the customer base continues to expand. |
| 99 | Data Reconciliation | 500 | | 500 | | | December 31, 2005 | This is phase 2 of the project. The objective of this project is to automate the manual reconciliation process and provide process and system changes. These changes will allow Union to use a proven methodology to consistently reconcile data relating to receipts, balancing and consumption across systems. |
| 100 | SCADA Telemetry Replacement | | | | | 1,000 | November 1, 2008 | This project is to implement new, more efficient and cost effective technology to connect the SCADA host computer to the field equipment on the pipeline. The current use of dedicated Bell circuits is inefficient as the technology is outdated. |
| 101 | Track Union System Customers Notional DP | | | 800 | | | December 30, 2005 | The current method of determining system supply is by default using combined system and DP results. This project relates to the specific tracking of system supply customers and will allow Union to track and report the transfer of customers, assets, and changes to receipt points to and from system supply/DP using the same processes and systems currently used to facilitate DP. The system will also enhance Customer Support regarding Capacity Management with respect to making spot purchase decisions. |
| 102 | PICSL - Physical Inventory Cust SubLedger | | | 600 | | | March 31, 2005 | This project began in 2004 and builds on the Financial Reconciliation of Storage Balances and Direct Purchase Data Reconciliation projects that were completed from 2002-2004. The project includes the automation of the integrated inventory reconciliation process, which will improve internal controls over gas inventory. |
| 103 | Aerial Photographs | | 566 | | | | December 31, 2004 | This project represents the costs associated with acquiring digital aerial photographs for all lines operating over 30% SMYS. The class location survey process is out of date and surveys are either old or incomplete, thus new surveys are required. |
| 104 | Unionline - Contract Level Security | | | 530 | | | July 31, 2005 | The Unionline security model will be updated from one that is maintained at the company level to one that is maintained at the contract level. The project will allow the user to be mapped to individual contacts, which will also aid in maintaining confidentiality of customer information for one of the main methods of transmitting information between Union and its customers. |

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($000's)

| Line No. | Function | Board Approved 2004 | Actual 2004 | Forecast 2005 | Forecast 2006 | Forecast 2007 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|
| 105 | TCPL Dovetail | 500 | | | | | n/a | This project is for software and enhancements required in response to the Trans-Canada Pipeline (TCPL) changing their computer system with regard to inter-connecting operators. The project will allow Union to continue to have effective communications with TCPL. |
| 106 | Integrity Management Program - IT component | | | 500 | | | throughout 2005 | In 2002, Union began implementing its Pipeline Integrity Management Plan. This portion of the project relates to IT applications, including the risk assessment software, public awareness and community education program, and integrity data integration. |
| 107 | Online B2B Customer Care | | | | | 1,000 | December 31, 2007 | This project will increase and add new functionality to the B2B online transactions. |
| 108 | Process Interface Integrity | | | | | 1,000 | December 31, 2007 | This project will either eliminate or automate outstanding manual interfaces that currently exist between key business processes (contract revenue, S&T revenue and inventory management). This improvement will allow Union to maintain and grow the business and to continue to meet or exceed SOX control objectives. |
| 109 | Financial Reporting & Integration | | | | | 750 | August 31, 2007 | System enhancements to provide timely and accurate financial reporting. |
| 110 | Customer Care - M2 split | | | | | 700 | December 31, 2007 | This project will create a new rate code for large volume customers within the M2 rate class. This is consistent with the rate structures of Rate 01 & 10 in the Union North franchise area. This M2 rate split is driven by Union's response to a Board directive in the 2004 rate case. |
| 111 | VB.Net Rewrites | | | | | 550 | December 31, 2007 | Software applications written in Visual BASIC are being moved to an internet based environment. |
| 112 | SCADA Replacement | | | | | 500 | January 1, 2009 | This project is to replace the SCADA host system (not field equipment or telemetry infrastructure), as the hardware and software is >10 years old and obsolete. The SCADA system is used to operate the Union Gas transmission, storage and distribution systems. |
| 113 | Automate Backend Processes | | | | | 500 | December 31, 2007 | This project is part of the overall Capacity Management initiative to improve yield management, planning, scheduling and operating systems capabilities. This project entails the creation of a capacity management system to enhance our ability to assess and forecast capacity utilization and make asset release decisions. |
| 114 | General Projects listed above | $ 13,562 | $ 11,747 | $ 23,240 | $ 31,958 | $ 39,898 | | |
| 115 | General Projects less than $500,000 | 4,729 | 4,553 | 9,810 | 8,608 | 10,045 | | |
| 116 | | $ 18,291 | $ 16,300 | $ 33,050 | $ 40,566 | $ 49,943 | | |

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($000's)

| Line No. | Function | Board Approved 2004 | Actual 2004 | Forecast 2005 | Forecast 2006 | Forecast 2007 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|
| | Other | | | | | | | |
| 117 | Indirect Overheads | 45,415 | 45,115 | 46,993 | 52,569 | 52,444 | | |
| 118 | Direct Capitalization | 4,443 | 4,191 | 4,505 | 4,352 | 6,868 | | |
| 119 | | $ 49,858 | $ 49,306 | $ 51,498 | $ 56,921 | $ 59,312 | | |

Details of Capital Expenditures and Justification for Projects in excess of $500,000

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($000's)

| Line No. | Function | Regulated Actual 2007 | Total Actual 2007 | Regulated Actual 2008 | Total Actual 2008 | Regulated Actual 2009 | Total Actual 2009 | Regulated Actual 2010 | Total Actual 2010 | Regulated Actual 2011 | Total Actual 2011 | Regulated Forecast 2012 | Total Forecast 2012 | Regulated Forecast 2013 | Total Forecast 2013 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Storage** | | | | | | | | | | | | | | | | |
| 1 | Dawn Plant F Compressor | 1,744 | 2,176 | | | | | | | | | | | | | December 29, 2006 | This project forms part of the Dawn-Trafalgar Facilities Expansion Program (2006 - 2007 winter), which allows for the incremental expansion of system capacity by adding pipeline sections and compression capability, as required, to meet growth in market demand. |
| 2 | Hagar Boil-off Compressor | | | | | | | | | | | 750 | 750 | 750 | 750 | June 1, 2013 | Replacement of the aging boil-off compressor to ensure on-going reliability and to reduce vented emissions. |
| 3 | Dawn Plant D Exhaust Replacement | | | 857 | 1,069 | | | | | | | | | | | December 6, 2008 | The existing exhaust silencer dates back to 1988/89 and is degrading in quality and effectiveness due to usage. Once the silencer has degraded to a certain point, it is no longer effective in noise reduction. |
| 4 | Storage Workshop North Yard | - | | 1,292 | 1,612 | 167 | 208 | - | | | | | | | | December 31, 2008 | The new facility is built to accommodate a workshop area, tool crib depot, compressor operations warehouse items, as well as large compressor components once all stages are complete. The previous warehouse only had sufficient space for normal warehouse items and no excess for storing large parts. |
| 5 | Dawn Plant J | | | 907 | 1,576 | 65 | 113 | 5,757 | 10,004 | 15,426 | 26,805 | 1,169 | 2,031 | | | September 30, 2011 | The Dawn A plant reciprocating compressors, ranging from 35 to 50 years old exceed the legislated Provincial Air emissions standards. The existing A plant has to be replaced in order to comply with the legislation. |
| 6 | Dawn E Plant HPT Blade Rejuvenation | - | | 637 | 637 | | | - | | | | | | | | November 27, 2008 | The high pressure turbine blades on the Dawn E RB211 are deteriorating and require rejuvenation. Rejuvenation removes any cracking and returns the metal to as-new condition. This work would extend the life of this component and would avoid a component failure while the unit is running. |
| 7 | Storage Well Upgrades | - | | 381 | 611 | | | - | | | | | | | | December 18, 2008 | The production casing in the wells contains a weld that could fail and cause an uncontrollable blow-out. This project replaces the top joint in the production case at the storage well. |
| 8 | Dawn B Lube Oil Skid Replacement | - | | 445 | 555 | 10 | 12 | - | | | | | | | | December 19, 2008 | To replace the lube oil skid in Dawn B Plant due to the age and obsolescence of the equipment as parts are no longer available and service is becoming increasingly difficult to find. |
| 9 | STO Dehy Incinerator Installations | | | | | 469 | 752 | 766 | 1,228 | | | | | | | November 3, 2010 | As part of the Comprehensive Certificate of Approval with MOE, benzene emissions from storage pool dehydrators were identified as unacceptable. MOE mandated that incinerators be installed on all 5 storage pool hydrators before the next operating season after 2008/2009. |
| 10 | Dawn E Exhaust Silencer Replacement | | | | | | | 1,239 | 1,239 | | | | | | | October 1, 2010 | This project will replace the exhaust silencer at Dawn E which is currently disintegrating and will help reduce overall noise levels at the plant to below the Certificate of Approval specifications. |
| 11 | Dawn E Gas Turbine Overhaul | | | | | | | | | | | | | 2,200 | 2,200 | May 1, 2013 | To complete a 50,000 hour overhaul on the Dawn E Rolls Royce RB211 24C. |
| 12 | Dawn - TCPL Westerly | | | | | | | 1,642 | 1,642 | | | | | | | November 30, 2010 | Install a NPS 24 ultrasonic meter run and replace all existing control valves to allow for bi-directional flow; existing valves are only suitable for uni-directional flow. |
| 13 | Hagar Solar Compressor Upgrades | | | | | | | 589 | 589 | | | | | | | December 10, 2010 | The Hagar gas turbine units (solar) were built in the late 1960s and have not been significantly upgraded since that time. With changes to the system, it has also been determined that only one unit will be required. This project will bring one of the Hagar units up to current standards, which will greatly increase reliability and safety. |
| 14 | Dawn G Silencer Replacement | | | | | | | | | | | | | 1,093 | 1,366 | October 31, 2013 | Plant G at the Dawn facility is exceeding target noise levels. In order to remain compliant with our Certificate of Approval, further noise mitigation is required by replacing the existing silencer with the inlet plenum. |
| 15 | 27,600 Volt Dead Buss Closure | | | | | | | | | 655 | 819 | | | | | November 1, 2011 | In the event of a utility (Hydro One) power failure all the individual plant generators at Dawn will start to feed emergency power to their specific areas of the Dawn Plant. If any one of these generators fail during operation and Hydro One power is still not available, that entire section of the facility will have NO POWER to support the associated plants continued operation. We need to have the ability to generate our own power from the 600 Volt system back up to our 27,600 Volt company owned network to allow an alternate power source to the failed area of the plant. |
| 16 | Dawn B Gas Generator Miidlife | | | | | | | | | 1,170 | 1,462 | | | | | October 1, 2011 | The Dawn B RB211 is due for a midlife overhaul in order to maintain unit reliability. Overhauls must occur when the unit has operated for 25,000 hours, but recent repairs have extended the limit to 30,000 hours. The unit currently has operated in excess of 30,700 hours. |
| 17 | Dawn Fire Hydrant System Upgrade | | | | | | | | | 626 | 783 | 400 | 500 | 200 | 250 | August 31, 2013 | The south yard fire hydrant system is antiquated, unreliable, does not have enough water capacity and the coverage is also inadequate. Recently the JHSC condemned the south yard fire pump because it failed to start the last 3 attempts and parts are not available for the 1943 Continental engine. |
| 18 | ECS Mandaumin Pool Modifications | | | | | | | | | | | 408 | 680 | | | November 1, 2012 | This project consists of construction of a separator, tank, and choker valves at wells 4, 6, and 7. These facilities will increase operational efficiency of the Mandaumin pool, allowing improved injection and withdrawal capacity. |
| 19 | STO Hagar Exhaust Stack Replacements | | | | | | | | | | | 800 | 800 | | | Summer 2012 | The purpose of this project is to reduce the KVGR exhaust noise by 25 dBA, and reduce the JVG, Turbine #1 and #2 exhaust noise by 15 dBA. This work has been identified in our Comprehensive Certificate of Approval and needs to be completed in order to comply with the CC of A. |
| 20 | STO Hagar Tank Painting | | | | | | | | | | | 500 | 500 | | | June 1, 2012 | The scope of the project is to repaint the entire LNG Storage Tank. It is currently degraded and outer tank metal is exposed to harsh elements of Northern Ontario weather. The paint is peeled on various sections exposing primer last barrier of protection. |
| 21 | Great Lakes Controllers 36" Bypass | | | | | | | | | | | | | 1,158 | 1,158 | December 1, 2013 | Replacement of the current NPS 16 pressure control bypass at Dawn's Great Lakes measurement facility with an NPS 36 pipe and control valve. By increasing the size of the Great Lakes Bypass, more effective design day throughput can be achieved. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Panhandle MOP Piping Replacement | | | | | | | | | | | | | 719 | 899 | July 31, 2013 | This project is to enhance the integrity of piping in and around the 20" Panhandle Measurement Site (meter runs and piping, including header connections). Meter run piping is of unknown grade and connecting piping is of a wall thickness and grade combination that results in a south yard MOP of 6778 kPa which is lower than the 6895 kPa MOP of the headers and the rest of the south yard. Removal and replacement of the low MOP 16" piping within the South Yard builds on the Integrity Project of the South Yard. |
| 23 | STO Bickford Control Systems Upgrade | | | | | | | | | | | 422 | 703 | | | April 1, 2012 | The Solar Unit at Bickford was installed in the early 80's and still has the original electronic control system with technology that is no longer supported by Solar Turbines. Modules that are sent out for repairs are gone for several weeks. The unit is available to pump gas if any part of the electronics fails. The unit is left unavailable while we wait for replacement parts to be repaired in an exchange program as new modules are not available for purchase. |
| 24 | Emergency Shut Down Valve | | | | | | | | | | | | | 320 | 534 | November 1, 2013 | This project will install Emergency Shutdown Valves (ESV) on all injection/withdrawal wells. The initial phase of this project targets pools that contain wells with the highest risk consequence ratings. High consequence wells were selected based upon: proximity to the nearest residence, distance from Dawn and maximum well flow. |
| 25 | CS - Sewage Lagoon Upgrade | | | | | | | | | 805 | 1,005 | | | | | December 15, 2011 | Recently the need for additional upgrades has become necessary due to age of the system and the fact that over the years of use, capacity has diminished. The need to add additional treatment to the wastewater effluent has also become necessary following the recommendations of the licensed lagoon operator and the engineering companies Union Gas has hired to study the Lagoon operation. Now there is a requirement to make upgrades to the Lagoon to meet the wastewater guidelines as set out by the Ministry of the Environment. |
| 26 | Storage Projects listed above | $ 1,744 | $ 2,176 | $ 4,517 | $ 6,060 | $ 711 | $ 1,085 | $ 9,993 | $ 14,702 | $ 18,682 | $ 30,873 | $ 4,449 | $ 5,964 | $ 6,440 | $ 7,157 | | |
| 27 | Storage Projects less than $500,000 | 3,926 | 5,028 | 2,060 | 2,715 | 2,730 | 2,872 | 1,938 | 3,159 | 5,123 | 5,986 | 6,965 | 8,341 | 5,122 | 6,329 | | |
| 28 | | $ 5,670 | $ 7,204 | 6,577 | $ 8,775 | 3,441 | $ 3,957 | $ 11,931 | $ 17,861 | $ 23,805 | $ 36,859 | $ 11,414 | $ 14,305 | $ 11,562 | $ 13,486 | | |
| | **Transmission** | | | | | | | | | | | | | | | | |
| 29 | Dawn-Trafalgar System - Hamilton to Milton | 2,685 | 2,685 | | | | | | | | | | | | | November 1, 2006 | In order to meet forecast customer demands for the 2006 - 2007 winter, the Hamilton to Milton pipeline facilities are required. This represents the cost of constructing these new facilities. |
| 30 | Dawn-Trafalgar System - Strathroy to Lobo | 50,318 | 50,318 | 1,330 | 1,330 | | | | | | | | | | | November 1, 2007 | This is the 2nd stage of the project. Current demands are being met by existing facilities, but these will be inadequate to meet demands in the future based on the number of forecasted new customers. Phase 2 will be necessary to service new customers added in late 2007 (see Parkway B Compressor below). |
| 31 | Parkway B Compressor | 58,327 | 58,327 | 3,341 | 3,341 | | | | | | | | | | | November 1, 2007 | Installation of a new gas turbine compressor at the Parkway station to help meet growing demands based on the number of forecasted new customers. This project coincides with the Strathroy to Lobo expansion of the Dawn-Trafalgar system. |
| 32 | Dawn-Trafalgar System - Brooke to Strathroy | 2,664 | 2,664 | | | | | | | | | | | | | November 1, 2006 | In order to meet forecast customer demands over the 2006 - 2007 winter, additional facilities are required. This represents the cost of obtaining these new facilities. |
| 33 | Integrity Management Program | 8,000 | 8,000 | 6,832 | 6,832 | 6,379 | 6,379 | 7,292 | 7,292 | 9,751 | 9,751 | 6,834 | 6,976 | 5,045 | 5,315 | Ongoing | Represents the continuation of a multi-year program to improve pipeline and station reliability and system performance while meeting all of the requirements of the NEB and TSSA Regulations. Dollars spent are focused on condition monitoring and remediation and risk reduction. |
| 34 | St. Clair Energy Centre | 11,430 | 11,430 | | | | | | | | | | | | | September 1, 2007 | A new power generation facility is being built in the Sarnia-Lambton area. In order to serve this plant, Union must build new facilities, as existing facilities cannot serve the incremental demand. |
| 35 | Odourant / Containment | 666 | 666 | 1,294 | 1,294 | 941 | 941 | 1,055 | 1,055 | 1065 | 1065 | 575 | 575 | 1,149 | 1,149 | Ongoing | Represents the continuation of multi-year program to rebuild odourant systems to reduce risk of spills and minimize negative consequences in the event that a spill happens. |
| 36 | Dawn-Trafalgar System - Bright | 18,536 | 18,536 | 52,275 | 52,275 | 2,379 | 2,379 | | | | | | | | | November 1, 2008 | This is Phase 3 of the Trafalgar expansion project, required due to additional customer demand in 2008. This project will increase capacity at the Bright compressor station by 47,000HP, which will create 347 MMcfd of additional transportation capacity on Union's Dawn-Trafalgar system. This expansion will increase existing system capacity by approximately 20%. |
| 37 | Dawn-Trafalgar System Replacements -Ayr Road | | | 2,619 | 2,619 | | | - | | | | | | | | October 17, 2008 | Development near the Owen Sound Take-off Valve site has triggered a class change that requires line replacement, hydrostatic testing and installation of crack arrestors. Failing to implement this project would result in decreased pressure ratings, and the inability of Union to meet its existing contractual obligations. |
| 38 | Bright B Gas Generator | | | | | | | 927 | 927 | | | | | | | October 25, 2010 | The Dawn B RB211 is due for a midlife overhaul in order to maintain unit reliability. These engines are typically due for midlife after 25000 hours of operation. Due to some recent repairs, the requirement was delayed until 30000 hours which has been surpassed. |
| 39 | Lobo B Silencer Replacement | | | | | | | 1,546 | 1,546 | | | | | | | December 20, 2010 | As part of Union's Emissions Action Plan (EAP), there are a number of noise source at the Lobo Compressor Station that have been identified as exceeding the target noise levels for the Lobo facility. To remain compliant with out Certificate of Approval, further noise mitigation is required which will involve modifying many vents and openings. |
| 40 | Bright B Silencer Replacement | | | | | | | 1,503 | 1,503 | | | | | | | December 22, 2010 | This project is to replace the exhaust silencer on the Bright B Plant. The existing silencer has degraded over time. The replacement is necessary to meet noise emission requirements. Overall noise levels are higher than the Certificate of Approval specifications. |
| 41 | Lobo Yard Piping Mod | 2,308 | 2,308 | | | | | | | | | | | | | December 14, 2007 | The proposed project is to complete piping modifications internal to the A Plant at Lobo station. The proposed work is to install new piping and associated fittings on both the suction and discharge headers of A plant. |
| 42 | Parkway Scrubber Refit | 1,406 | 1,406 | | | | | | | | | | | | | November 21, 2007 | To refit Parkway's TCPL delivery scrubber with cyclotube elements and relocate to Parkway Plan A suction line. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | Lobo B HP Turbine upgrade | 1,366 | 1,366 | | | | | | | | | | | | | December 14, 2007 | The Lobo engine (1750-223) RB211 was sent to TransCanada Turbines in the late spring of 2007 for investigative work. Elevated vibrations were detected during the 2006-2007 operating season. Once implemented, three major areas of impact were found: (1) Fire damage to the 05 module; (2) Impact damage to the high pressure section of the compressor; (3) Deterioration of the high pressure turbine blades (HPT). |
| 44 | Palmerston HP Looping | 668 | 668 | | | | | | | | | | | | | August 10, 2007 | The Palmerson MOP 1900kPa system has reached capacity due to continued growth in the communities that it serves. The system was originally installed in 1963 and looping was installed in 2003 and 2005 to restore an inlet pressure of 700kPa into Atwood Gate. Looping in addition to the 2003 and 2005 reinforcement is required to service new customers and maintain minimum inlet pressures to stations along the system. |
| 45 | Dawn-Trafalgar System Replacements - NPS 26&34 Hwy 25 (Phase 1) | | | 5,276 | 5,276 | 3,744 | 3,744 | - | | | | | | | | November 1, 2008 | Replacements are required to maintain current MAOP of 6169kPa as governed by CSA Z662 due to class location changes. Affected section is Trafalgar Lines between Hwy 25 and Tremaine Road. The scope of work entails complete replacement of both pipelines. |
| 46 | Puslinch Transmission Station | | | 2,616 | 2,616 | | | - | | | | | | | | October 2, 2008 | The transmission station can no longer hold the outlet pressure required to supply the minimum required inlet pressures for the three downstream stations: Guelph West Gate 19U-201: Guelph Gate 19V-101: and Roszell Rd 19U-601R. Stations engineering has identified that there is a large pressure drop across the filter that should be improved. |
| 47 | West GTA (Halton Hills) | | | 1,944 | 1,944 | 19,411 | 19,411 | 431 | 431 | | | | | | | August 4, 2009 | Construct approximately 6 kilometres of 20 or 24 inch pipeline from the Trafalgar Transmission System to the Halton Hills Generating Station. Install valves and odorizing facilities at the take-off and a metering and regulation station at the customer site. Final design including pipeline length and size to be determined subject to the results of environmental routing and public consultation. |
| 48 | London - Dominion Line Replacement Phase 1 | | | 1,041 | 1,041 | | | - | | | | | | | | November 5, 2008 | Install approximately 1700m of NPS 10 ST to replace the Dominion Line Thames River crossing which was abandoned in March due to a B leak. MOP of the line will be 1900kPa. |
| 49 | Highway 26 - Meaford to Thornbury (Phase 1) | | | - | - | 2,417 | 2,417 | - | - | | | | | | | September 23, 2009 | The MTO is rebuilding 9.8km oh Highway 16 between Meaford and Thornbury. The road/ditch profile will be changed along the entire length of the section to be rebuilt. It is expected that the impact on our plant will be significant at each intersection. Due to the extent of the conflicts through this section, 9.8km of NPS 6 pipe will be replaced with NPS 8. |
| 50 | Eastern Delhi Reinforcement | | | | | 1,436 | 1,436 | | | | | | | | | August 18, 2009 | This project involves the construction of 5800m of NPS 8 steel pipeline from the outlet of Brantford Rd Transmission Station (12T-201) running south along Fertilizer Rd to Lynedoch Rd Station. In order to maintain the minimum required inlet pressure at Stelco, the Stelco north station will be modified to have a minimum inlet pressure of 140 psig in addition to the NPS 8. |
| 51 | Galt Gate Station | | | - | - | 1,624 | 1,624 | - | - | | | | | | | October 15, 2009 | This project involves the replacement of the entire NPS 8, high-pressure headers at the Galt Gate. In order to supply the required minimum inlet pressures at the Cambridge Gate Stations, the minimum outlet from Galt Gate must be 480 psig. It was 480psig. |
| 52 | Guelph Transmission Reinforcement - Phase 2 | | | - | - | 3,781 | 3,781 | - | - | | | | | | | September 18, 2009 | Due to general system growth in Guelph, system reinforcement is required to maintain an adequate supply of gas in the Guelph Transmission station. This project will involve the construction of a 41000m loop of the existing NPS 10 Guelph Line in Punlinch Township. |
| 53 | Vector-Courtright Filter/Separator | | | | | 945 | 945 | | | | | | | | | Ocotber 01, 2009 | To mitigate risk of contamination and provide protection for the Sarnia Industrial system, install filter/separators at the existing interconnect station between Vector pipeline and Union. Due to recent system upsets along the Vector Pipeline, high levels of liquids have been received at Dawn and there is no protection at Courtright when Union is taking supply there. |
| 54 | Lobo A & B | | | | | 1,446 | 1,446 | 7,288 | 7,288 | 35,776 | 35,776 | 1,231 | 1,231 | | | December 1, 2011 | With recent system growth Lobo has reached ultimate capacity. Critical system constraint at Lobo due to very high flow, pressure drop, and station configuration. Excessive turbulence and vibration due to high flow velocities have led to unexpected equipment failures over the last 2 winters. |
| 55 | Dawn-Trafalgar System Replacements - NPS 26&34 Hwy 25 Tremaine (Phase 2) | | | | | 2,497 | 2,497 | | | | | 6,226 | 6,226 | | | September 10, 2012 | Replacements are required to maintain current MAOP of 6160 kPa as governed by CSA Z662 due to class location changes. Affected section is Trafalger Lines between Hwy 25 and Tremaine Rd, Milton. The scope of work entails complete replacement of both pipelines. |
| 56 | Lobo C TFEP Phase IV | | | 3,499 | 3,499 | (3,499) | (3,499) | | | | | | | | | Project Cancelled | As additional demands are added to the Dawn Trafalgar system, additional facilities will be required. Union will ensure that the project will be fully subscribed. |
| 57 | Highway 26 - Woodford to Meaford (Phase 2) | | | | | | | 4,002 | 4,002 | | | | | | | June 17, 2011 | The MTO is planning to rebuild Hwy 26 and Meaford. The road and ditch profile will change along with the entire 4.1km truck climbing passing lane. Due to the extent of conflicts in this section, the entire NPS 6 steel will be replaced with NPS 8. This is the 3rd and final phase of MTO's rebuild. |
| 58 | Lobo B Scrubber Upgrade | | | | | | | 644 | 644 | | | | | | | September 30, 2010 | The current unit internals are a metal mesh material, and are constantly becoming plugged with pipeline liquids and debris. The new style internals ("cycle-tubes") are a new technology which uses tubes to remove the liquid without risk of plugging. In addition, the increased flow through Lobo B unit is putting the current internals under higher stress loads. |
| 59 | Dawn Trafalgar Valve Nest MAOP Upgrade | | | | | | | 974 | 974 | | | | | | | October 1, 2010 | To replace a number of small pipe segments near the Trafalgar take-off valve nest at the perimeter of the Dawn north yard boundary. This section has a reduced maximum allowable operating pressure as compared to the sections it is connected to. |
| 60 | Leamington Line Replacement Ph 3a | | | | | | | | | 1,394 | 1,394 | | | | | October 31, 2011 | This pipe has a history of unweldable pipe which is attributable to 6 C leaks within phase 3 and 4 that exist. 16 service have been teed due to the condition of the pipe, and in certain areas customers were turned down for gas. This project will focus on completing the work in the Town of Wheatley. |
| 61 | Transmission Line of Depth Cover | | | | | | | | | | | 972 | 972 | 972 | 972 | ongoing | This $1.0 million expenditure forecast for both 2012 and 2013 is part of a multi-year plan to lower or replace sections of the NPS 26 Dawn-Parkway pipeline. These sections were identified in the 2003 Depth of Cover Survey as having insufficient cover requirements as per the CSA Z662 code. Lowering or replacing these sections of pipe will also address landowner concerns raised during Dawn-Trafalgar Facility Expansion Program ("TFEP") land negotiations. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62 | Leamington Line Replacement Ph 3b | - | | | | | | | | | | 1,191 | 1,191 | | | October 31, 2012 | This submission is for the 3b phase of the Leamington Line. After this phase there will be one phase remaining in the original scope of work. This project has been identified for many years due to the condition and age of the pipe. There are currently 10 outstanding C leaks which will be eliminated as part of this phase. There was also 2 B leaks which were repaired last year one of which used a $10K pumpkin that will be reclaimed as part of this phase. In addition to the leaks this project will also eliminate numerous repair clamps, dresser couplings without sufficient strapping, a leaking valve nest below grade vault and also many aerial crossings. Many of these aerial crossings have exposed dressers or clamps on them. |
| 63 | Leamington Line Replacement Ph 3c | | | | | | | | | | | | | 1,358 | 1,358 | September 1, 2013 | This submission is for the last phase of the Leamington Line replacement. This project has been identified for many years due to the condition and age of the pipe. There are currently 3 outstanding C leaks and 6 repaired within the past 5 years (1 B leak) which will be eliminated as part of this phase. In addition to the leaks this project will also eliminate numerous repair clamps and dresser couplings without sufficient strapping along with many aerial crossings. |
| 64 | Station Painting | | | | | | | | | | | 800 | 800 | 800 | 800 | ongoing | This expenditure supports our overall Distribution Integrity plans and is required to ensure we are completing adequate corrosion protection to the above ground piping at all company stations. As a visible asset we also want to ensure the condition of these stations represents the company's commitment to quality and to ensure safe reliable supply. |
| 65 | Parkway West | | | | | | | | | | | 15,000 | 15,000 | 80,000 | 80,000 | November 1, 2014 | Development of new compression facilities and security of supply attachment for Enbridge and TCPL. |
| 66 | Marcellus - Kirkwall Station Modification | | | | | | | | | | | 4,651 | 4,651 | 51 | 51 | November 1, 2012 | This is a strategic project which will allow Marcellus shale gas to access the Union Gas system, including Dawn and Parkway. By attracting Marcellus shale gas to Ontario this provides in-franchise customers access to competitive supply that diversifies the gas supply portfolio. |
| 67 | Parkway TCPL Measurement Upgrade | | | | | | | | | | | 6,710 | 6,710 | | | November 30, 2012 | TCPL measurement at Parkway does not currently meet AGA standards. Significant measurement discrepancy has been recorded between Union and TCPL at this site. Replacement of the Union measurement at this site will reduce measurement error and allow proper reconciliation of volumes. |
| 68 | Owen Sound Replacement | | | | | | | | | | | 1,217 | 1,217 | 17,893 | 17,893 | December 1, 2013 | The Owen Sound Line has been identified as a line that needs to be considered for replacement through the Integrity Management program. The program has found integrity issues which include seam flaws, metal loss, dents and stress corrosion cracking. Several of these issues are not readily detectable through current techniques and are time dependent. |
| 69 | ENG - Bristol 3330 Replacement Program | | | | | | | | | | | 1,386 | 1,386 | 1,677 | 1,677 | ongoing | The current technology - the Bristol 3330 RTUs - became obsolete in 2009. Bristol's migration plan is to upgrade the existing Bristol 3330 RTUs to the Control Wave Micro RTU. The goal of the Bristol 3330 Obsolescence Program is to develop a migration plan that would see UGL upgrade stations while recovering and developing inventories to operate and maintain the remaining stations with Bristol 3330's until 2018. |
| 70 | Bright A Silencer Relocation | | | | | | | | | | | | | 1,100 | 1,100 | September 1, 2013 | Relocate/rebuild 4 blowdown silencers in the Bright A yard to a common blowdown area at the south yard between Plant A and B. |
| 71 | Dover Transmission STN Rebuild | | | | | | | | | | | | | 832 | 832 | May 1, 2013 | Currently the Dover transmission station is in deplorable condition and continues to have Non Conformances during QA audits. The money is required to bring the building and station up to standard. Issues include the following: site grading, corrosion and coating issues, buried flanges and building upgrades. |
| 72 | 20" Panhandle Emerg VLV Relocation | | | | | | | | | | | | | 758 | 758 | November 1, 2013 | This project would replace and relocate P57, 300 valve and the other infrastructure to the west to the current 16" and 20" Panhandle Launcher Receiver site. Currently, these valves are located in close proximity to the Dawn valley Road. There is no barrier or isolation preventing a car or truck to drive directly into this valve nest. (Last year we did have a close call). In the event this did occur Dawn would not be able to feed either the 16" or 20" Panhandle from Dawn, putting the complete Panhandle system at risk. |
| 73 | Bright A Pulsation Mitigation | | | | | | | | | | | 1,982 | 1,982 | | | October 1, 2012 | Replacement of high pressure gas piping connected to the Bright A1 and A2 compressor casings with stiffer piping and replacement of existing piping supports. High frequency pulsation generated by compressor leading to piping vibrations and continuous instrumentation failures has resulted in reduced control/monitoring. |
| 74 | Transmission Projects listed above | $ 158,374 | $ 158,374 | $ 82,067 | $ 82,067 | $ 43,501 | $ 43,501 | $ 25,662 | $ 25,662 | $ 47,986 | $ 47,986 | 48,775 | $ 48,917 | $ 111,635 | $ 111,905 | | |
| 75 | Transmission Projects less than $500,000 | 746 | 746 | 2,267 | 2,267 | (785) | (785) | (521) | (521) | 305 | 305 | (890) | (890) | 2,160 | 2,160 | | |
| 76 | | $ 159,120 | $ 159,120 | $ 84,334 | $ 84,334 | $ 42,716 | $ 42,716 | $ 25,141 | $ 25,141 | $ 48,291 | $ 48,291 | $ 47,885 | $ 48,027 | $ 113,795 | $ 114,065 | | |
| | **Distribution** | | | | | | | | | | | | | | | | |
| 77 | New Business Portfolio | 35,283 | 35,283 | 38,470 | 38,470 | 27,129 | 27,129 | 35,226 | 35,226 | 40,963 | 40,963 | 43,011 | 43,011 | 48,592 | 48,592 | ongoing | Represents the costs incurred to attach the forecasted customer additions. Individual project economics are produced for each project before the actual expenditure is undertaken. |
| 78 | Replacement Majors | | | | | | | | | | | | | | | | |
| 79 | Meter and Regulator Replacements | 6,956 | 6,956 | 8,907 | 8,907 | 12,047 | 12,047 | 13,363 | 13,363 | 12,500 | 12,500 | 12,032 | 12,032 | 10,958 | 10,958 | ongoing | Represents the replacement of meters and regulators that have reached the end of their life. They are replaced to meet Measurement Canada accuracy standards. |
| 80 | Main Replacement - municipal roadwork / | 7,382 | 7,382 | 11,460 | 11,460 | 13,371 | 13,371 | 14,293 | 14,293 | 13,183 | 13,183 | 16,477 | 16,477 | 17,385 | 17,385 | ongoing | Represents the replacement of main due to age and condition as well as municipal roadwork. Risk based assessment is done to determine which lines to replace for age and condition. |
| 81 | Service Replacements | 1,768 | 1,768 | 1,773 | 1,773 | 1,114 | 1,114 | 1,942 | 1,942 | 1,712 | 1,712 | 2,400 | 2,400 | 2,616 | 2,616 | ongoing | Represents the replacement of services due to age and condition of municipal roadwork, main replacement and plant improvements. Risk based assessment is done to determine which services to replace for age and condition. |
| | Specified Projects | | | | | | | | | | | | | | | | |
| | OPG - Thunder Bay | | | | | | | | | | | | | | | March 1, 2007 | Facilities include 32km of NPS 12 main from TCPL facilities to the power generation site; upgrade Belrose and Onion Lake |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 82 | Inside Meter/Reg Relocation | 2,835 | 2,835 | 4,022 | 4,022 | 382 | 382 | | | | | | | | | ongoing | Where the service is operating at a pressure greater than 2.5 kPa inside a building with inside regulation, this project includes the relocation of the regulator to the outside of the building. |
| 83 | Hwy 518 Relocation Phase II - Parry Sound | 2,702 | 2,702 | | | | | | | | | | | | | September 30, 2006 | Costs to relocate the Parry Sound Lateral as required by the original Encroachment Agreement with the MTO as a result of road reconstruction on Hwy 518. |
| 84 | Leamington Line to Wheatley Replacement | 1,540 | 1,540 | | | | | | | | | | | | | September 30, 2006 | Replacement of 27km of NPS 6 line operating with a MOP of 620 kPa on the Leamington Line from Stevenson Road in Wheatley to the east side Leamington with NPS 8 3450 MAOP pipe. |
| 85 | Oullette Ave Replacement | 626 | 626 | | | | | | | | | | | | | December 21, 2007 | To replace 880m of NPS 4 IP S CT with approx 545m of NPS 2 IP PE and 623m of NPS 4 IP PE main along Ouellette Avenue - Wyandotte St - Pitt St - Park Street and Goyeau Street. |
| 86 | Oullette Ave Replacement - Phase 2 | | | 715 | 715 | | | | | | | | | | | May 12, 2008 | To replace approx 500m of NPS 4 IP S CT with approx 175m of NPS 2 IP PE and 340m of NPS 4 IP PE along Ouellette Avenue - Wyandotte St - Dufferin Av and Goyeau - as shown |
| 87 | Brighton Road Replacement - Phase 2 Tecumseh | | | 569 | 569 | | | | | | | | | | | September 11, 2008 | To replace 856.6m of NPS 3 MIP S CT & 40.5m of NPS 1 1/4 MIP PE & 44.0m of NPS 2 MIP S & 119m of NPS 2 MIP PE main with approx 25m of NPS 1 1/4 MIP PE - 350m of NPS 2 MIP PE and 925m of NPS 4 MIP PE along Brighton Rd - from north of Tecumseh Road - northerly to Riverside Drive. |
| 88 | Hamilton-Garth St. Replacement | | | 1,189 | 1,189 | | | | | | | | | | | September 5, 2008 | NO AID TO CONSTRUCTION. THE CITY OF HAMILTON IS RECONSTRUCTING GARTH ST BETWEEN DARLINGTON DR AND BENDAMERE AVE. THE EXIST MAIN IS IN A NON-STANDARDLOCATION AND HAS BEEN INDICATED TO BE TOO SHALLOW, CONSEQUENTLY IN CONFLICT WITH THE NEW ROAD BASE, CURBING AND CATCH BASINS. PROJECT AUDITED BUT NO 8" STEEL PIPE CHARGED TO THE JOB AND THERE SHOULD BE 853 M JT 2008/10/25 |
| 89 | Sudbury Property Line PRS Removal | 838 | 838 | 913 | 913 | 562 | 562 | 519 | 519 | | | | | | | Ongoing | This project is to remove the property line regulator stations along the Sudbury Lateral through the Valley East area of Sudbury. The removal of the stations is required due to the growth related encroachment on existing municipal right of ways that now cause corrosion of the stations due to winter road maintenance. |
| 90 | Windsor Academy LP Phase 1 | | | 1,273 | 1,273 | | | | | | | | | | | November 21, 2008 | This is the first phase in the replacement of a large low pressure (LP) area in South Windsor. There are over 1,100 homes currently fed by an LP system that will be converted to IP pressure. |
| 91 | Windsor Academy LP Phase 2 | | | | | | | | | | | | | 1,875 | 1,875 | December 1, 2013 | This project is the second phase in the replacement of a large low pressure area in South Windsor. The low pressure area is bordered by Dougall Ave to the East, Cabana Rd. to the south, West Grand Blvd. to the north and Mckay to the west. The area is a mixture of LP pipe and IP pipe. It is the second phase of a three-phase plan to replace the LP pipe in this area. This project will eliminate 20 leaks, 11 of which are outstanding. This project is a Risk Rank 3 (L4, C2), and has a P22-C9 on the Leakage model.) |
| 92 | Erb St. West Replacement | 1,758 | 1,758 | | | | | | | | | | | | | December 7, 2007 | Abandon and replace 8" main on Erb St, Waterloo between Fischer Hallman and Westmount Rd. The project included the tie over and replacement of services. Main was under road. |
| 93 | Laural St. Leakage Replacement | 525 | 525 | | | | | | | | | | | | | August 29, 2007 | This project involves the installation of 631.0m of NPS 2 and NPS 1 1/4 intermediate pressure fused plastic main on Laurel Street, Schlueter St., North St., Eagle St. and Whitley St. It will also include the reclassification of service to main 52.0m of NPS 1 IP PE pipe. This project will involve the renewal of 75 services and the tie-over of 23 services. This project is proposed to eliminate a system of bare, low-pressure pipe that is in very poor condition and is repetitively exhibiting leaks. The upgrade of this system from Low to Intermediate pressure will, furthermore, enable the elimination of one LP distribution station. |
| 94 | London - Old South LP Replacement | 534 | 534 | | | | | | | | | | | | | August 31, 2006 & 2007 | This project includes the first and second phase of LP main replacement on the London Old South system. |
| 95 | Hamilton Service Centre | | | | | | | 2,817 | 2,817 | 2,457 | 2,457 | 11,704 | 11,704 | 13,575 | 13,575 | November 30, 2013 | The current Regional Office Building (62,830 sq.ft.) which was constructed 52 years ago is in need of extensive renovations to bring the building up to today's basic standards for an office environment. This project includes the purchase of land and construction of a new Regional office including the new Central Technical Training Centre located at 918 South Service Road, Hamilton, Community of Stoney Creek. |
| 96 | Burlington Service Centre | 8,006 | 8,006 | 3,146 | 3,146 | | | | | | | | | | | April 1, 2008 | The new Burlington facility at 4475 Maniway Rd shall be a single storey 25800 sq ft building on a 4 acre site. It is to replace our current 19636 sq ft leased facility at 4450 Paletta Court in Burlington. Lease expiry April 2008. |
| 97 | Windsor Service Centre - Net Property Salvage | (6,059) | (6,059) | | | | | | | | | | | | | June 29, 2007 | Proceeds from Sale of the Windsor facility located at 650 Division Rd, Windsor. |
| 98 | London Dispatch & Office | 1,001 | 1,001 | | | | | | | | | | | | | December 28, 2007 | Renovate existing Administration area for Planning and Dispatch to incorporate the R8 Advantex Program recently announced for the Southwest Region. |
| 99 | Windsor Service Centre | 1,251 | 1,251 | 7,457 | 7,457 | 5,988 | 5,988 | | | | | | | | | June 8, 2009 | The new Windsor facility at 3840 Rhodes Drive shall be a two storey 40440 sq ft building. It is replacing our current 61555 sq ft sold and leased back facility at 650 Division Rd, Windsor. Leaseback expiry June 2009. |
| 100 | Kingston Service Centre | 918 | 918 | 2,494 | 2,494 | 8,548 | 8,548 | | | | | | | | | October 19, 2009 | The new Kingston facility on Fortune Cres Ext shall be a two storey 30645 sq ft building a 3.1 acre site. It is replacing our current 16 598 sq ft sold and lease back facility at 520 Gardiners Rd, Kingston. Leaseback Expiry Dec, 2009. |
| 101 | Windsor- Grand Marais | 638 | 638 | | | | | | | | | | | | | July 9, 2007 | The 12" bare line is in poor condition, has had numerous leaks and clamps put on it, is fairly shallow and a large portion is under the existing road. Without the installation of approximately 160 anodes in the next couple years, the plant will fall below acceptable corrosion protection. |
| 102 | Halton - George-Main St. Church | 579 | 579 | | | | | | | | | | | | | March 15, 2007 | Reconstruction on Main St from Church St to Guelph St requires the relocation of 230m of NPS 6 HP ST main and 272m of NPS 2 IP ST main. It may be in conflict with the proposed subgrade or water works to be constructed. |
| 103 | North Bay - Wickstead DRS Repl | 663 | 663 | | | | | | | | | | | | | December 19, 2007 | Rebuild of station - Install Station; Install 504.m NPS 6 Std; Install 70-m NPS 8 Std; Site Preparation; Retire Station; Land Rights |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 104 | Windsor - LaSalle Reinforcement | 626 | 626 | | | | | | | | | | | | | December 7, 2007 | Reinforcement is required due to the continued growth in the municipality of La Salle. This reinforcement will deliver a high pressure feed into downtown La Salle and bring the pressure on the southside of La Salle back up to acceptable levels. |
| 105 | London - Hyde Park Reinforcement | 538 | 538 | | | | | | | | | | | | | January 21, 2008 | This project is Phase 1 of a three phase project that will provide reinforcement to the rapidly growing NW corner of the City of London. The facilities include 3500 metres of 6" ST IP main. Without this project, current facilities will not be able to handle the increased demand. |
| 106 | Waterloo - Guelph IP Reinforcement | 548 | 548 | | | | | | | | | | | | | June 25, 2007 | Existing facilities will not maintain minimum system pressures in Northeast Guelph. Reinforcement involves 2500m NPS 6MOP 420kPa along City Rd 30 from Silvercreek Pkwy to Hwy 6. |
| 107 | Kingston - Net Property Salvage | (1,027) | (1,027) | | | | | | | | | | | | | January 31, 2007 | Proceeds from Sale of facility located at 520 Gardiners Rd, Kingston. |
| 108 | Windsor - Great Northern Hydroponics Cogen | 760 | 760 | | | | | | | | | | | | | December 8, 2007 | Without the reinforcement, there is not enough capacity in the HP network to service the proposed cogeneration facility. The new dedicated service and customer station are required to service the cogeneration unit. |
| 109 | Belleville - Kelloggs Plant | 1,923 | 1,923 | | | | | | | | | | | | | October 5, 2007 | The current IP system in Belleville will not be able to support the load of a new facility being built by Kellogg's. This project involves looping the existing system as well as some station work. |
| 110 | Waterloo - Georgian Villas | 1,592 | 1,592 | | | | | | | | | | | | | December 1, 2007 | This project is to supply gas to a new residential development located to the north of Owen Sound. There is a plan for roughly 1500 new residential units and several commercial units. The project involves constructing 9100m of NP4 HP Steel, 4700m of NPS6 PE pipe, a distribution station and the distribution network. |
| 111 | East Windsor Cogen (Pristine) | | | 5,555 | 5,555 | | | - | | | | | | | | June 27, 2008 | There is a large industrial cogen plant to be built. This load addition will require either looping of the existing 12"MOP 1250kPa line out of the Walker Rd Station. This submission is to request money to be used to complete an environmental assessment, regulatory requirements, geo-tech testing, title searches and pre-engineering survey to determine which alternative is most feasible in 2007. |
| 112 | East Owen Sound Line Looping | | | 1,571 | 1,571 | | | - | | | | | | | | December 1, 2008 | This project involves the installation of 2.5 km of NPS 8 pipe between Owen Sound Gate Station and the commencement of the NPS 8 section that was installed in 2005. This reinforcement is required to maintain the minimum inlet pressure at the Grey County Exchange near Collingwood (at the end of our system). The area around Owen Sound on the shoreline of Georgian Bay across to Collingwood continues to exhibit tremendous growth. There is a large development (~1600 homes) that is planned for the area around Grey Rd 19 and the 4th Line in the Town of the Blue Mountains. This area is currently not serviced with gas and is at the extreme eastern end of our system. |
| 113 | Meaford Big Head River Replacement | | | 1,340 | 1,340 | | | - | | | | | | | | April 29, 2009 | Work consisted of 840m of permanent hot mix asphalt for restoration of half of the roadway, as well as top soil and spray to clean up Municipal Park. |
| 114 | London District Energy (CORE) | | | 1,033 | 1,033 | | | - | | | | | | | | September 18, 2008 | Facilities are needed to feed the proposed cogen expansion at the London District Energy (Core Energy) plant in London. The facilities include 480m of NPS 4 PE IP, a SCADA point, and customer station modifications |
| 115 | London - Old South LP Replacement Phase 3 | | | 911 | 911 | | | - | | | | | | | | November 7, 2008 | Phase 3 of London Old South will replace 3800m NPS 8, 6, 4, 2 and 1 1/4 LP main with NPS 4, 2 and 1 1/4 IP PE and approximately 215 services. There will also be 2 LP stations that can be abandoned: 130-114 and 130-112. Plan is to prevent other potential leaks before they occur as there are 11 outstanding leaks and is either bare of the coating information is prior to records. |
| 116 | IMS - Johnstown Ethanol Plant | | | 899 | 899 | | | - | | | | | | | | August 8, 2008 | Greenfield Ethanol is building an ethanol plant in Johnstown with plans to be producing ethanol by 08/01/2008. UG plans to provide 6500m of 4" steel main, to rebuild the existing Prescott station and to provide service and a station to Greenfield. |
| 117 | Bracebridge Reinforcement | | | 816 | 816 | | | - | | | | | | | | July 21, 2008 | This project is required for the installation of 1105m of 6" steel main complete with a new DRS at entrance Drive. Also we will cut the 4" 175 psi feed from the Bracebridge Office to the south end of Bracebridge and loop a section of 4" steel main at Keith and Ecclestone Dr. This project also includes a crossing at the Muskoka River on Ecclestone Dr and will allow 500 psi from the Trans-Canada take off all the way to Entrance Dr where it will be cut to 175psi. |
| 118 | TSSA Fuel Safety Program | | | 1,163 | 1,163 | 846 | 846 | | | 616 | 616 | 838 | 838 | 838 | 838 | ongoing | Upgrade the burner fuel controls for 20 Indirect Fired Line Heaters located in System and Customer Stations throughout Union's franchise area. The specific heaters will be chosen based on a risk level priority and available Union field resources. There are a total of 75 heaters that required the burner fuel controls be upgraded. This expenditure will continue the upgrade for year 4 of a four year program that will see all 75 heater fuel controls upgraded. |
| 119 | Leamington - County Road 14 | | | 682 | 682 | | | - | | | | | | | | February 27, 2008 | To install 1000m of 6" HP steel from end of existing (627 County Rd 14) Westerly (409 County Rd 14) |
| 120 | Belrose TBS Rebuild | | | 660 | 660 | | | - | | | | | | | | December 5, 2008 | This project includes the installation of a filter and telemetry as well as the replacement of the regulation and over-pressure protection at the Belrose TBS. It is a critical station feeding into Thunder Bay as it is one of two feeds and provides approx 60% of the city's flow; it is the main feed to Bowater. The existing over-pressure protection does not comply with UGL design requirements, the current pressure regulation is under capacity and does not meet UG design standard for full redundancy. |
| 121 | Iroquois TBS | | | 591 | 591 | | | - | | | | | | | | January 30, 2009 | The isolation valve to the relief valve is leaking and is corroded and must be replaced. The station needs to be painted to change colour and to coat bare/exposed piping. The station requires an electrical upgrade to remove high pressure transmitters from the RTU building to a non-hazardous location. The heater will need to be replaced as it is not compliant under the B149.3 code. |
| 122 | Balmy Beach Expansion | | | 580 | 580 | | | - | | | | | | | | December 19, 2008 | A new business expansion will be completed to serve the Georgian Villas development. This station will also be able to provide residents of Balmy Beach Natural Gas service which they have not previously had. |
| 123 | Maitland - Invista Lineheater | | | 568 | 568 | | | - | | | | | | | | November 21, 2008 | Due to previous heat exchanger damage, it is deemed necessary to replace the steam system with a glycol system. |

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| 124 | Corbyville TBS | | | - | - | 709 | 709 | - | | | | | | | | September 30, 2009 | Since the Kellogs feed was activated, there have been problems with pressure swings at Corbyville TBS since bringing on the new backfeed for the industrial park from Airport TBS. This is only going to get worse as Kelloggs increases their load to ramp up for production. The heater will be upgraded in 2008 and the odourant is a YZ system that will be budgeted within this project for upgrade to MOIS. Also NPS6 valve on outlet is seized. |
| 125 | Creekford Road Reinforcement - Phase 1 | | | - | - | 2,811 | 2,811 | - | | | | | | | | October 27, 2009 | Due to the volume of forecasted growth in the northeast of Kingston, the system is now at a point where a requirement for major reinforcement exists in the system. The issue is not with the capacity of the distribution network, but the capacity of the lateral into the Woodbine TBS. In order to increase the minimum inlet into Woodbine TBS, some of the load must be shifted off this feed. |
| 126 | Fort Frances Replacement | | | 263 | 263 | 5,000 | 5,000 | 5,385 | 5,385 | | | | | | | ongoing | This Project involves the installation of approximately 800m of 4" plastic main on Christie Ave and Fifth St, in Fort Frances. The reinforcement will restore system pressures and allow for approximately 5 years of future development based on 1% growth rate. |
| 127 | Warehouse Consolidation Facilities Retrofit | | | | | 720 | 720 | | | | | | | | | September 14, 2009 | Renovate existing Sudbury Warehouse, Construction & Growth and Welding areas to accommodate consolidated warehouse operations in Sudbury serving NW, NE and Eastern districts. Modify Thunder Bay existing warehousing area to provide segregated and controlled storage areas for the thunder Bay Emergency Warehouse materials and the Construction & Growth Company Crew materials. Replacement of racking in London Warehouse dependant on outcome of upcoming racking assessment. |
| 128 | Hwy 77-Bet Mers Rd 6 & Mers Rd | | | | | 522 | 522 | | | | | | | | | May 2, 2009 | To install approx 547m of NPS 4 IP PE main along the west side of Highway 77 - and to install approx 1535m of NPS 4 HP YJ main along the east side of Hwy 77 - between Mers Rd 6 and Mers Rd 8 - as shown. This project includes - 5 Tie Overs and 13 - Service Renewals |
| 129 | Dalhousie St. Replacement Amherstburg | | | | | 633 | 633 | | | | | | | | | April 16, 2010 | To replace 1240.0m of NPS 4 IP STL main with 1240.0m of NPS 6 IP YJ main along Dalhousie St from Pickering St to County Rd 20 (Front Rd). Also NPS 2 IP PE and NPS 1 1/4 IP PE for tie ins. Renew 36 services and tie over 39 services. |
| 130 | London - Wonderland Rd. North | | | | | 682 | 682 | | | | | | | | | December 3, 2009 | This project will involve installing 970m of NPS 8 ST IP, 50m of NPS 4 ST IP, 3m of NPS 2 PE IP and 222m of NPS 1 ¼ PE IP on Wonderland Rd. N. in the City of London. This section of pipe was identified to be in the conflict with the City of London's plan to widen the road. 800m of NPS 8 ST IP on the west side of Wonderland Rd. N. will be abandoned. |
| 131 | Halt-Winston Churchill Blvd. | | | | | 634 | 634 | | | | | | | | | November 6, 2009 | THE REGION OF PEEL WILL BE MANAGING THE FULL ROAD RECONSTRUCTION OF WINSTON CHURCHILL BLVD FROM STEELES AVE TO NO. 5 SIDERD.AS A RESULT OF THE ROAD WIDENING AND RE-ALIGNMENT, OUR EXISTING MAIN (AS WELL AS SOME OF THE MAIN INSTALLED PREVIOSLY, BUT NOT GASSED UP)WILL BE IN CONFLICT WITH THE NEW ROAD BASE, CURBS AND DITCHING. |
| 132 | Highway 62 - Maitland Drive | | | | | 824 | 824 | | | | | | | | | June 30, 2009 | Replace/Relocate existing NPS 2" WIP with NPS 4" PMP. Replace/Relocate existing NPS 4" WIP, NPS 4" WHP & NPS 6" WHP. Reconnect/Replace all existing services to new main. |
| 133 | Sarnia - Petrolia IP Replacement | | | | | 570 | 570 | | | | | | | | | November 13, 2009 | This project was completed to replace bare steel main on Petrolia Line, Oozloffsky, and Ignatiefna in Petrolia. Original pipe was installed in 1937/1954 and required new anodes to be installed to protect the line. Pipe was in too poor of condition that the anodes could not be installed. At time of replacement, there were 9 outstanding leaks. |
| 134 | London - Hale St. Replacement | | | | | 580 | 580 | | | | | | | | | November 3, 2009 | This project was completed to replace bare, unprotected steel main in Old South London (Beaconsfield, McKinnon, Victor, Westcott). Original pipe was installed in the 1920-30's and had 42 outstanding leaks at time of replacement. |
| 135 | Windsor - Byng/Turner/Bliss Replacement | | | | | | | 656 | 656 | | | | | | | November 12, 2010 | To abandon approximately 2500m of 4" St, 100m of 2" St and an LP station 06B-505R. This is an LP system which is made up of PTR, DL and Bare pipe in very poor condition. The leak history shows 2 C leaks and 1 B leak on Bliss, 1 C leak and 1 A leak on Byng, 11 C leaks and 2 B leaks on Turner. The installation of approximately 1500m of 1 /14" PE, 2300m of 2" PE and 204 service renewals. Along with the removal of the station will remedy this area of the leaks. |
| 136 | Milton - East Gate Station | | | | | | | 2,289 | 2,289 | | | | | | | December 1, 2010 | The new and proposed commercial/industrial loads along Steeles Ave are currently being fed solely from the Milton Gate 275 psig cut. Since the development commenced along Steeles in 2002, along with other growth throughout Milton, Acton, and Georgetown, the Milton Gate 275 psig cut has exceeded capacity and the 275 psig system has reached its minimum inlet to Acton TBS. |
| 137 | Inside Regulator Project | | | | | | | 546 | 546 | | | | | | | ongoing | This is the final year of a 3 year program to relocate inside meter regulation setup or install Excess Flow Valves on services with inside regulation. Mitigation is comprised of relocating the facilities outside where practical to do so and where not practical installation of EFV or ventless regulation will be the desired remediation. At all sites visited during the project we are turning all CVT's and checking all wall pieces for corrosion. |
| 138 | Waterloo Office - HVAC, Roof Replacement, Weld Shop Relocation | | | | | | | 1,686 | 1,686 | | | | | | | December 30, 2010 | The current air handler in the Waterloo office is a Life Cycle issue and is creating a reliability issue as the current Air Handler is 25 years old and showing severe signs of metal decay. The duct work is needed to be expanded to properly service the office area. |
| 139 | Kingston Microturbine TriGen - Phase 1 | | | | | | | 817 | 817 | | | | | | | December 30, 2010 | The facility heating and cooling is designed to operate as tri-gen, all other necessary equipment, absorption chiller, cooling tower etc. is being installed. Normalized installation of products and services to enhance the performance of Union Gas facilities in response to safety, environmental, life cycle and recommended activities. |
| 140 | North Bay Meter Shop Addition | | | | | | | 2,008 | 2,008 | | | | | | | December 30, 2010 | The North Bay Meter Shop will not be able to effectively operate in the current state. The lack of space makes working in the warehouse and repair areas challenging. An EHS audit was recently done and the crowded aisles in the warehouse and shops were identified as a problem. it is less effective as they spend a considerable amount of time moving items in order to get stored items. |
| 141 | Highway 3 Replacement | | | | | | | 516 | 516 | | | | | | | ongoing | To lay 2698.4m of 2" IPPE and 1230.0m of 4" IPPE. To lay 138.0m of 6" IP ST and 194.0m of 8" HP ST. To abandon 3", 6" and 8" SYJ; To abandon 2" IPPE; To abandon 2" SYJ; To abandon 4" IPPE. |

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| 142 | C&G Cheapside IP Replacement | | | | | | | 744 | 744 | | | | | | | November 11, 2010 | This project will replace bare, unprotected steel main located on St. George St., Cheapside St. and Richmond St. in the City of London. It will replace 59 services, 900m of 8" bare, unprotected steel and 420m of 6" bare, unprotected steel, with plastic. |
| 143 | London - Dundas St. Replacement | | | | | | | 1,219 | 1,219 | | | | | | | December 22, 2010 | This project replaced bare, unprotected steel main located on Dundas St, Ashland Ave and King St. in the City of London. It replaced 32 services, 15 m of 12" protected steel, 352 m of 8" bare unprotected, 103 m of 8" steel protected, 664 m of 6" bare unprotected and 145 m of 4" protected steel main. This project was part of London District's accelerated bare, unprotected replacement plan. This pipe was installed from 1935-1936. This area has 6 outstanding leaks and 40 historical leaks on this section of pipe, including an 'A' and 'B' leak this past spring bringing the total to 2 'A' leaks and 9 'B' leaks. |
| 144 | Windsor - Generic Greenhouse | | | | | | | | | | | 767 | 767 | 767 | 767 | ongoing | Provides funds for the Windsor / Chatham greenhouse market to serve new customers, where 30 random acres could be added to the system. |
| 145 | DO - REPL - LOND - Central & Colborne - London | | | | | | | | | 714 | 714 | | | | | December 22, 2011 | This project will replace bare, unprotected steel main that has been identified due to the leaks that have occurred on this section of pipe. This area is part of the Pondon district's 10 year, BARE, Unprotected Steel Replacement Plan. |
| 146 | DO - REINF - LOND - Third Feed Wonderland Rd | | | | | | | | | 5,366 | 5,366 | | | | | December 8, 2011 | The northwest area of the City of London is currently experiencing a significant amount of growth, and there are no stations in the vicinity to feed the expanding IP system. Ten year projected loads show the expansion continuing in this direction. |
| 147 | DO-REPL-LOND - York&William | | | | | | | | | 959 | 959 | | | | | December 22, 2011 | This project will replace bare, unprotected steel main that has been identified due to the leaks that have occurred on this section of pipe. This area is part of the London District's 10 year, Bare, Unprotected Steel Replacement Plan. Total Historical Leaks: 1A, 11B, 13C; Leaks in past 5 years: 2B, 7C; Currently Outstanding: 6C. This increasing trend is likely due to the deterioration of the current pipe. |
| 148 | Guelph Watson Rd Reinforcement | | | | | | | | | 1,259 | 1,259 | | | | | December 17, 2011 | Due to continued growth in the City of Guelph, the existing facilities will not maintain minimum system pressures in East Guelph. This project is constructed entirely in road allowance, under 100% built-up condition, with both creek and railway crossings. |
| 149 | Dunn - Alder St. REPLACEMENT | | | | | | | | | 673 | 673 | | | | | August 5, 2011 | This project requires the relocation of gas plant from our existing non-standard location due to municipal road reconstruction. Both main and services are in conflict throughout this project, specifically with the proposed 1050 mm elliptical storm sewer, joint-utility conduit and hydro transformers. The presence of large mature trees throughout the road allowance limits the possibilities for utility redesign to mitigate costs. |
| 150 | NW - Kraft SMS - Ft. Frances | | | | | | | | | 954 | 954 | | | | | September 30, 2011 | This project entails the relocation and reconstruction of the Kraft SMS and Mowatt TBS in Fort Frances. It will reduce the risk of damaging the station pipe, allow technician access. This results in increased Technician time and scheduling in order to perform the required SOP work. |
| 151 | CS - Waterloo District Office Renovation | | | | | | | | | 4,814 | 4,814 | 2,296 | 2,296 | | | April 1, 2012 | The current building was constructed 26 years ago with several small renovations and upgrades. More extensive interior and exterior work is required to bring the existing office building and interior environment up to the LEED standard. |
| 152 | Halton Hills - Steeles (Trafalgar - Winston Churchill) | | | | | | | | | | | 775 | 775 | | | September 1, 2012 | The Region of Halton is urbanizing Steeles ave in Halton Hills from Trafalgar Road to Winston Churchill (Road widening/Curbs/Sidewalks/Storm/Water Main/Sanitary). After providing location and depth mark-ups to the Consultant for the Region it was found that our 8" HP & 2" PE IP mains are in direct conflict with the new curbs/storm drains and drainage ditches (we were advised to relocate back to standard location in areas where the PL has changed due to the widening). |
| 153 | Thunder Bay Power Plant | | | | | | | | | 183 | 183 | 862 | 862 | 27,978 | 27,978 | November 30, 2013 | The Thunder Bay power generation project is identified in the Ontario Long Term Energy Plan. It will convert 300 MW of coal fired power generation to gas fired power generation. This project is approximately 30 kilometre of pipe in length running from TCPL mainline to the current Thunder Bay coal generation site. |
| 154 | Guelph Combined Heat and Power | | | | | | | | | | | 176 | 176 | 1,101 | 1,101 | September 1, 2013 | Installation of 3560m of NPS 12 high pressure steel "Guelph Transmission Line" 6160 kPa from Wellington Rd 34, northerly along Wellington Rd 35 to Puslinch Transmission Station and installation of 2500m of NPS 4 high pressure steel 3450 kPa direct feed out of Puslinch Transmission Station to Guelph Combined Heat and Power. Installation of new customer station on Guelph CHP. |
| 155 | Sudbury - Kelly Lake IP | | | | | | | | | | | 1,105 | 1,105 | | | September 30, 2012 | The South section of Sudbury has experienced significantly higher than expected commercial and residential growth in the past number of years which has brought the distribution system to minimum system pressure. To continue serving the current and planned growth in the area, reinforcement is required to increase the capacity of the system. |
| 156 | London-English St. Leakage | | | | | | | | | | | 612 | 612 | | | November 30, 2012 | This project will replace bare unprotected main with 1750 m NPS 1.25 PE, 640 m NPS2 PE, and 380 m NPS4 PE including 223 services and abandoning 1 LP station. This is part of the London District accelerated replacement program. This project is targeting bare unprotected steel main that has been identified due to leaks that have occurred on this section of pipe. |
| 157 | London Centra Ave Leakage | | | | | | | | | | | 979 | 979 | | | November 1, 2012 | This project will replace bare unprotected LP and IP main with 2180 m NPS 1.25, 800 m NPS2, and 12500 m NPS 8 main including 279 services and abandoning 2 LP station. This is part of the London District accelerated replacement program. This project is targeting bare unprotected steel main that has been identified due to leaks that have occurred on this section of pipe. |
| 158 | Sarnia - Petrolia Line Leakage | | | | | | | | | | | | | 1637 | 1,637 | August 1, 2013 | This project will replace bare, unprotected high pressure NPS 6 steel main on Petrolia Line between Plank Rd and Oozlofsky St, Petrolia that has been identified due to the leaks that have occurred on this section of pipe and the high operating pressure. The bare steel main will be replaced with 9100 m of NPS 6 HP ST main including 57 first stage cut services. |
| 159 | Sarnia - Cathcart Leakage | | | | | | | | | | | | | 584 | 584 | November 1, 2013 | This project will abandon 4380 m NPS 2 and NPS 3 S B and will install 2130 m 1 1/4 PE, 1600 m NPS 2 PE, and 650 m NPE 4 PE IP including 154 services. This is part of the London District accelerated replacement program. This project is targeting bare unprotected steel main that has been identified due to leaks that have occurred on this section of pipe. |

Details of Capital Expenditures and Justification for Projects in excess of $500,000
Calendar Year Ending December 31, 2007 - 2013
Includes IDC
($000's)

| Line No. | Function | Regulated Actual 2007 | Total Actual 2007 | Regulated Actual 2008 | Total Actual 2008 | Regulated Actual 2009 | Total Actual 2009 | Regulated Actual 2010 | Total Actual 2010 | Regulated Actual 2011 | Total Actual 2011 | Regulated Forecast 2012 | Total Forecast 2012 | Regulated Forecast 2013 | Total Forecast 2013 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | Sault St. Marie - Goulais Replacement | | | | | | | | | | | | | 965 | 965 | June 1, 2013 | The NPS 8 piping located under Goulais Ave in SSM is deteriorating. A damage on this line in 2006 revealed that there is a significant build up of debris in the pipe from the manufactured gas, and the pipe itself contained numerous laminations, corrosion pitting and ultra sonic thickness testing indicated that the pipe was welded together with single-pass welds. The proposal includes the retiring of approximately 1070 metres of coal tar coated NPS 8 Sl main and install 220 metres of NPS 4PE main, 1259 m metres of NPS 2, 475 m of NPS 4 STl, relocate an existing DRS and replacing 70 services. Land will be acquired for the new station. |
| 161 | North Bay - Eloy TBS | | | | | | | | | | | | | 586 | 586 | June 1, 2013 | Eloy Station cuts from TCPL (6895 kPa MOP) to 1210 kPa MOP using monitor regulators. These regulators are not protected with a filter. The turbine meter does not have a filter in front of it to protect the debris from damaging this measuring device. On a design day the station's peak load is currently over capacity (Capacity= 23.4 $km^3$/hr). The current station design has a 3" axial flow relief valve, however, it can only handle approximately 20,000 $m^3$/hr of flow before the downstream system pressure will exceed code requirements of maintaining an emergency pressure of 1.1 times MOP: the regulator fail-open capacity is 72,250 $m^3$/hr, so, depending on how much system demand is on during this failure (max design day flow = 23,660 $m^3$/hr), the failure of the over-protection will violate code requirements by varying magnitudes. Rebuilding the station to ensure system integrity is not compromised due to not having filters. The new design would remove the possibility of the relief being in close proximity to the entry/exit of the station. |
| 162 | Lambton Power Plant | | | | | | | | | 20 | 20 | 40 | 40 | 1,800 | 1,800 | November 30, 2014 | The Lambton project is identified in the Ontario Long Term Energy Plan. It will convert 950 MW of coal fired power generation to gas fired generation. The project will be comprised of approximately five kilometres of pipeline running from the Lambton site and connecting with existing local Union infrastructure. |
| 163 | Red Lake Distribution Phase 1 | | | | | | | 80 | 80 | 887 | 887 | | | | | September 15, 2012 | The proposed pipelines and ancillary facilities represent Phase I of Union's planned system expansion into this area which includes distribution pipeline conversion of Goldcorp mines located in Town of Red Lake, Ontario. |
| 164 | Red Lake Distribution Phase 2 | | | | | | | | | | | 7,370 | 7,370 | | | September 1, 2012 | Phase II of construction will provide distribution pipe into the Municipality of Red Lake. Phase II has been scheduled for 2012. It will involve constructing distribution pipelines to provide natural gas service to the residents and businesses of Red Lake, Balmertown, Cochenour, Chukuni River Subdivisions, and any other residents and businesses along the Red Lake Lateral who request service. |
| 165 | CS - London Facility Renovation | | | | | | | | | 3,579 | 3,579 | | | | | December 22, 2011 | Facility is 43 years old and requires updating to bring it up to today's office standards. London warehouse will become the new central warehouse, renovation includes additional racking, loading dock upgrades, updated lighting, office space, USR shop and tool room relocated. A new generator which will provide full facility back up power will be installed. New ergonomic workstations, business centre, conference rooms, private offices, carpets, and finishes. |
| 166 | DO - Delhi Church St | | | | | | | | | 604 | 604 | | | | | August 15, 2011 | There are currently a total of 17 outstanding "C" leaks congested on Church St and Bell St. The branch is making repairs to the existing system as much as possible. In 2009, TSSA issued an order requesting Union Gas to either lower or replace a section of gas main on Church St in Delhi because it was believe that this section of old age gas pipeline was not laid deep enough to cover depth requirement in code Z662-07. |
| 167 | DRIC Highway C | | | | | | | | | 809 | 809 | | | | | June 30, 2014 | Required for the Windsor Essex Parkway project. This project is 100% cost recovery. Relocate distribution mains along the west and east side of Huron Church. |
| 168 | PLPRS DEF | | | | | | | | | 514 | 514 | | | | | November 12, 2011 | Install NPS 4 PE and NPS 2 PE pipe along 1000 m of Regional Rd 80 east of Michelle Drive in Hanmer on either side of the street. There are 3 services that require replacement (5752, 5822 and 5831 Regional Rd 80) as the existing services are 3/4" steel. |
| 169 | SMC - Burlington Gate Hydron | | | | | | | | | 700 | 700 | | | | | December 1, 2011 | Boilers and heat exchanger need to be upgraded to allow for inspections as well as providing the flexibility to feed from both Bronte Gate and Burlington Gate. |
| 170 | Cobourg TBS | | | | | | | | | 602 | 602 | | | | | October 31, 2011 | The scope of this project is to replace the existing station as per drawings. The existing CWT will be reused. The entire station can be taken out of service using a new NPS 6 line stopper installed on the outlet and having TCPL shut off the inlet. |
| 171 | Distribution Projects listed above | $ 74,704 | $ 74,704 | $ 99,020 | $ 99,020 | $ 83,672 | $ 83,672 | $ 84,106 | $ 84,106 | $ 94,068 | $ 94,068 | $ 101,444 | $ 101,444 | $ 131,257 | $ 131,257 | | |
| 172 | Distribution Projects less than $500,000 | 19,041 | 19,041 | 14,092 | 14,092 | 11,853 | 11,853 | 17,730 | 17,730 | 18,258 | 18,258 | 24,418 | 24,418 | 24,540 | 24,540 | | |
| 173 | | $ 93,745 | $ 93,745 | $ 113,112 | $ 113,112 | $ 95,525 | $ 95,525 | $ 101,836 | $ 101,836 | $ 112,326 | $ 112,326 | $ 125,862 | $ 125,862 | $ 155,797 | $ 155,797 | | |
| 174 | Customer Attachments | | 24,335 | | 24,122 | | 17,634 | | 19,995 | | 19,295 | | 20,318 | | 22,491 | | |
| | **General** | | | | | | | | | | | | | | | | |
| 175 | Transportation Replacements | 6,587 | 6,897 | 6,104 | 6,392 | 2,668 | 2,794 | 8,500 | 8,900 | 10,604 | 11,104 | 7,640 | 8,000 | 7,645 | 8,005 | ongoing | Represents the cost of the recommended vehicle and equipment replacements based on the corporate replacement policy. |
| 176 | ITE Project | 4,097 | 4,220 | 3,848 | 3,964 | 5,483 | 5,648 | 4,848 | 4,994 | 6,954 | 7,163 | 7,959 | 8,198 | 8,939 | 9,208 | ongoing | Represents the cost of delivering computer related infrastructure for Union. Spending on Information Technology will replace obsolete equipment and upgrade hardware on existing machines to extend their useful lives. |
| 177 | Gas Distribution Access Rules | 2,287 | 2,356 | | | | | | | | | | | | | January 1, 2007 | This represents the cost of IT technology required to implement the final phase of the GDAR. The in-service date for EBT standards and rate-ready ABC service for large volume customers is January 1, 2007 and the bill-ready service is January 1, 2008. |
| 178 | Replace RM/MC Software | 1,793 | 1,847 | 1,072 | 1,104 | | | | | | | | | | | January 1, 2007 | The Resource Management/Mobile Client software is nearing the end of its life cycle and the manufacturer is no longer developing enhancements for this product. The new software (MDSI) will have the functionality to book appointments and schedule multi-rep and multi-day work; this will enhance productivity and client service. |
| 179 | GIS Upgrade Phase 1 | 855 | 881 | 2,613 | 2,692 | 2,383 | 2,455 | 2,426 | 2,499 | | | | | | | April 30, 2010 | The current product is obsolete and the vendor is no longer supporting or enhancing the product. This project is to provide additional internal resources to support and upgrade the system. Failing to do so will result in returning to paper mapping, which is not a feasible option. |
| 180 | CARE Reliability | 548 | 564 | | | | | | | | | | | | | Dec.31, 2006 & 2007 | This represents the cost of hiring external contractors to assist with the critical problem of dealing with the "must do" CARE items. These items cannot be supported by the existing IS complement. |

Details of Capital Expenditures and Justification for Projects in excess of $500,000
Calendar Year Ending December 31, 2007 - 2013
Includes IDC
($000's)

| Line No. | Function | Regulated Actual 2007 | Total Actual 2007 | Regulated Actual 2008 | Total Actual 2008 | Regulated Actual 2009 | Total Actual 2009 | Regulated Actual 2010 | Total Actual 2010 | Regulated Actual 2011 | Total Actual 2011 | Regulated Forecast 2012 | Total Forecast 2012 | Regulated Forecast 2013 | Total Forecast 2013 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 181 | IVR Replacement | 795 | 819 | | | | | | | | | | | | | December 31, 2007 | The existing IVR system is reaching the end of its life. The vendor is starting to curtail system support in 2006 and will no longer offer support in 2008. The new system will have improved functionality and handle a greater number of incoming calls. The increased capacity will benefit Union and its clients in future years as the customer base continues to expand. |
| 182 | SCADA Telemetry Replacement | 783 | 807 | 1,554 | 1,601 | 1,128 | 1,162 | 1,209 | 1,245 | | | | | | | Dec.31, 2007 & 2008 & 2009 | This project is to implement new, more efficient and cost effective technology to connect the SCADA host computer to the field equipment on the pipeline. The current use of dedicated Bell circuits is inefficient as the technology is outdated. |
| 183 | SCADA Replacement | 796 | 820 | 824 | 849 | 1,700 | 1,751 | 3,152 | 3,247 | 2,588 | 2,666 | | | | | December 22, 2011 | This project is to replace the SCADA host system (not field equipment or telemetry infrastructure), as the hardware and software is >10 years old and obsolete. The SCADA system is used to operate the Union Gas transmission, storage and distribution systems. |
| 184 | Customer Support Reliability | 564 | 581 | | | | | | | | | | | | | January 28, 2007 | Ensure funding is available for Contract Resources and third party IS vendors to maintain compliance with internal and external mandates. These dollars will be utilized to hire contractors and professional services in support of Union Gas IT applications. |
| 185 | ESPM (NGEIR) | 1,876 | 1,932 | 2,832 | 2,917 | | | | | | | | | | | June 15, 2008 | In response to the OEB Natural Gas Electric Interface Review ("NGEIR") process, Union Gas entered into a Settlement Agreement on June 13, 2006. As part of this Agreement, Union committed to offering new exfranchise power services. This capital project will fund the changes required to offer these new services. |
| 186 | Focus (CM System Automation) | - | - | 1,130 | 1,164 | 1,295 | 1,334 | | | | | | | | | January 1, 2008 | It will develop automated systems to enhance the ability to determine Union's capacity position in order to allow timely asset release decisions or Gas supply purchase decisions in order to capitalize on market opportunities. |
| 187 | SAP East ERP Upgrade | - | - | 925 | 953 | | | | | | | | | | | April 20, 2009 | Upgrade SAP to the current release ERP 6.0. This will ensure we maintain continuous SAP support and accommodate the International Financial Reporting Standards starting in 2010. |
| 188 | S&T Application Enhancement | | | 1,247 | 1,285 | | | | | | | | | | | throughout 2008 | The purpose of this project is to enhance the functionality, performance and reliability of the S & T applications at Union Gas. There are three primary applications in this area: CARE, Contrac and Unionline. Other applications are also enhanced by this project. |
| 189 | Cafeteria Equipment Upgrade - Safety Initiative | 111 | 114 | 500 | 515 | | | | | | | | | | | November 20, 2008 | Upgrade the kitchen equipment and food display units in order to offer healthier food options in a reinvented atmosphere that encourages Union Gas employees to choose the cafeteria over dining elsewhere. |
| 190 | Purchase Gas Scopes | | | | | 951 | 980 | | | | | | | | | April 26, 2009 | The dollars will be spent on continuing the replacement and upgrade of our calibration stations, software and gas scopes that are used by USR's, DSD and Technicians. In 2009 we will be outfitting the following districts with the new gas detection equipment; Eastern, Windsor, Hamilton, and Halton |
| 191 | IT Demand Management - Bus Development/S&T | | | | | 657 | 677 | | | 2,719 | 2,801 | | | | | ongoing | Uses allocate IT capital to group a dozen smaller projects into a single submission to be managed by IT Demand Management, based on emerging demands. |
| 192 | Probability and Risk Optimization | | | | | 556 | 573 | 1,167 | 1,202 | 579 | 597 | | | | | February 28, 2012 | This project reviews the historical use of assets (molecule, space, Dawn to Parkway transportation, and deliverability) to determine opportunity for increased revenues. |
| 193 | Panasonic Laptops | | | | | | | 2,240 | 2,307 | | | | | | | December 22,2010 | This project is to lifecycle the current in-truck Panasonic CF29 Toughbooks. |
| 194 | SAP BCP Implementation | | | | | | | 810 | 834 | | | | | | | April 18, 2011 | Implement SAP: Business Objects Planning and Consolidation (BPC) an IT solution for budgeting and forecasting to replace the current Excel model. |
| 195 | GIS Replacement | | | | | | | | | 1,390 | 1,432 | | | | | April 30, 2011 | Replace the existing Intergraph AM/FM?GIS System for both distribution and Transmission. This project ensures the foundational system is in place to foster continued compliance to the Pipeline Integrity Program. The current technological system is unreliable and obsolete. |
| 196 | IS Projects | | | | | | | | | 2,035 | 2,096 | 1,942 | 2,000 | 1,942 | 2,000 | ongoing | Include upgrades replacements, replatforming work that keeps the asset running and supported. This will ensure continued vendor support and reliable product and development environments. |
| 197 | Supply Chain Excellence Program | | | | | | | | | 801 | 825 | 126 | 130 | | | March 12, 2012 | Supply Chain Excellence is an enterprise - wide effort to transform the way we source, manage, and buy materials and services. |
| 198 | Ground Floor Tower Renovations | | | | | | | | | 183 | 189 | 1,459 | 1,503 | | | April 1, 2012 | The proposal is design & engineer to completely renovate the ground floor tower to accommodate an auditorium, conference and meeting rooms. HVAC, washrooms and access/exiting facilities shall be modified to suit new purpose as per ULG direction. |
| 199 | Gas Measurement Business Intelligence | | | | | | | | | 2,104 | 2,168 | 582 | 600 | | | July 1, 2012 | The investment in this project will provide the following benefits to Union Gas: increase the effectiveness of the business by removing barriers between information; improve the consistency, quality and timeliness of information; improve decision quality through the use of timely, accurate information and proper tools; reducing risk by managing info throughout its life cycle and by making it easier to analyze; creating business value by allowing business units the ability to combine info in new ways to create new products and services faster and at less cost. |
| 200 | Business Support | | | | | | | | | | | 2,752 | 2,835 | 2,257 | 2,325 | ongoing | This project includes the Demand Management process which will evaluate emerging enhancement requests to determine if they meet specific criteria prior to being approved. Demand Management will also include links back to Finance for any identified process efficiencies or new revenue opportunities. |
| 201 | Contact Centre Infrastructure - VOIP | | | | | | | | | | | 728 | 750 | 728 | 750 | ongoing | Develop a platform to support VOIP for contact centers centrally with full redundancy. This will include Avaya Aura and more then likely a call recorder due to the fact this is standard in each call center configuration we have today. It's expected this project will see all call center sites moved to this platform over the life of the project (Brantford, Thunder Bay, London, caps, hr, DP etc.). |
| 202 | IS Application Lifecycle Projects | | | | | | | | | | | 1,456 | 1,500 | | | ongoing | This capital submission will fund the smaller lifecycle projects of Union Gas Business Groups that are associated with aging and at risk environments. |
| 203 | CARE / Contrax Replacements | | | | | | | | | | | 2,973 | 3,062 | 9,006 | 9,277 | June 30, 2014 | This project will begin the 'modernization' of the Unionline environment to ensure that we are well positioned to meet the needs of our customers in the future. The core of CARE and Contrax are approximately 15 years old, with Unionline being approximately 10 years old. With dated technology, we are at risk of not being able to meet the expectations of our customers as noted above. In addition, the support and enhancement of these applications have become very complex and costly due to the amount of change/growth that has occurred in these applications over the last 15 years. |

Details of Capital Expenditures and Justification for Projects in excess of $500,000
Calendar Year Ending December 31, 2007 - 2013
Includes IDC
($000's)

| Line No. | Function | Regulated Actual 2007 | Total Actual 2007 | Regulated Actual 2008 | Total Actual 2008 | Regulated Actual 2009 | Total Actual 2009 | Regulated Actual 2010 | Total Actual 2010 | Regulated Actual 2011 | Total Actual 2011 | Regulated Forecast 2012 | Total Forecast 2012 | Regulated Forecast 2013 | Total Forecast 2013 | In Service Date | Justification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 204 | EAM (Enterprise Asset Management) | | | | | | | | | | | 971 | 1,000 | 3,883 | 4,000 | ongoing | A company-wide effort which will result in a comprehensive solution to plan and control Union Gas's assets throughout their lifecycle from acquisition through installation, maintenance, and disposal. EAM will provide standardized processes and practices to monitor and measure performance of operating assets, in order to make better decisions about these assets within the regulatory framework. EAM will manage maintenance activities associated with these assets, as well as manage the procurement and materials management functions required to execute construction and maintenance activities. EAM standardized processes and practices will be enabled by a single application. EAM will supply information which will increase the ability to manage costs, increase the productivity of each asset, increase efficiency and ensure compliance with regulatory requirements. |
| 205 | GMAS Upgrade | | | | | | | | | | | 612 | 630 | | | December 31, 2012 | The Gas Measurement and Accounting System (GMAS) is Union's software tool used to track and manage daily physical measurement, including that for storage injections and withdrawals and for all pipeline interconnects. Houston and Calgary are also running their own instances of the GMAS application. This application was first implemented in 2007 and it's upgrade is overdue. This upgrade is totally dependent on the 3rd party vendor 'Telvent' and the successful implementation of the upgrade in Houston. |
| 206 | Meter Reading Replacement | | | | | | | | | 1,037 | 1,068 | 2,912 | 3,000 | | | December 31, 2012 | Union Gas ITRON handheld meter reading units and system needs to be replaced / upgraded due to end of life. |
| 207 | SCADA Enchancements | | | | | | | | | | | 827 | 852 | 584 | 602 | ongoing | The purpose of this project is to provide enhancements to the SCADA system used to operate the Union Gas storage, transmission and compression assets. These enhancements are required to derive the maximum value from the newly updated SCADA system and to maintain compliance with our IT standards for control systems. |
| 208 | Leasehold Improvements - Chatham | | | | | | | | | 2,134 | 2,199 | | | | | February 11, 2012 | Renovate leased office space at 100 King St. to include approx 195 workstations, meeting rooms, enclaves, business centers, washrooms, storage rooms, lan room, lunch room, kitchenette, directors offices, mail room which will free up much needed space at Head Office. |
| 209 | Data Centre DRP Update | | | | | | | | | 1,081 | 1,114 | | | | | October 31, 2012 | This project determined what the current Disaster Recovery Plan should contain. When we compared this to what we have the Gap was identified. Phase II will be the work involved to close the Gap. There are additional applications to be added to the DR and some existing applications have short recovery times. |
| 210 | OEB Customer Service | | | | | | | | | 578 | 595 | | | | | November 30, 2012 | The OEB has mandated a set of guidelines, the Customer Service Standards Rules, for gas utilities to follow. Union Gas Customer Care has reviewed these guidelines, and has identified several changes that have to be made to Union Gas' CIS systems. |
| 211 | General Projects listed above | $ 21,091 | $ 21,838 | $ 22,649 | $ 23,436 | $ 16,823 | $ 17,374 | $ 24,351 | $ 25,228 | $ 34,789 | $ 36,017 | $ 32,939 | $ 34,060 | $ 34,984 | $ 36,167 | | |
| 212 | General Projects less than $500,000 | 7,104 | 7,648 | 8,075 | 7,485 | 6,015 | 6,248 | 7,346 | 7,547 | 2,942 | 3,030 | 3,526 | 3,664 | 2,231 | 2,325 | | |
| 213 | | $ 28,195 | $ 29,486 | $ 30,724 | $ 30,921 | $ 22,838 | $ 23,622 | $ 31,697 | $ 32,775 | $ 37,731 | $ 39,047 | 36,465 | $ 37,724 | $ 37,215 | $ 38,492 | | |
| | Other | | | | | | | | | | | | | | | | |
| 214 | Indirect Overheads | 48,756 | 48,824 | 52,515 | 52,675 | 51,109 | 51,246 | 48,994 | 49,128 | 52,387 | 52,387 | 53,426 | 54,707 | $ 53,333 | 54,322 | | |
| 215 | Direct Capitalization | 7,251 | 7,251 | 8,590 | 8,590 | 8,348 | 8,348 | | | | | | | | | | |
| 216 | | $ 56,007 | $ 56,075 | $ 61,105 | $ 61,265 | $ 59,457 | $ 59,594 | $ 48,994 | $ 49,128 | $ 52,387 | $ 52,387 | $ 53,426 | $ 54,707 | $ 53,333 | $ 54,322 | | |
| 217 | TOTAL | $ 342,737 | $ 345,630 | $ 295,852 | $ 298,407 | $ 223,977 | $ 225,414 | $ 219,599 | $ 226,741 | $ 274,540 | $ 288,910 | $ 275,052 | $ 280,625 | $ 371,702 | $ 376,162 | | |

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Ref: Exhibit B1, Tab 2
Exhibit B1, Summary Schedule 2

On average, for the period 2007 to 2012 inclusive, by how much per annum did Actual Capital Expenditures fall below the total amount proposed for approval in EB-2005-0520 for the 2007 Base Year?

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**Response:**

Whether or not Union over or under spends its actual total annual capital budget relative to the total capital budget approved at the time 2007 base rates were set is irrelevant. This is the case because capital spending in any year is a combination of expansion capital and maintenance/IT capital. Expansion capital expenditures are tied to specific projects and have revenue streams associated with them. Depending on market and economic conditions, expansion capital may be significant in one year and non-existent in the next year.

Maintenance/IT capital, on the other hand, is influenced to a lesser extent by market conditions and may or may not be revenue generating. It can also be influenced by the timing of combining certain projects with others, to ensure the most efficient and least intrusive approach to the projects. Maintenance/IT capital includes capital costs associated with distribution expansion and reinforcement, maintaining the integrity of distribution, transmission and storage facilities, life cycling of existing information technologies and implementing new information technologies. If, in any given year, Union were to reduce capital spending on Maintenance/IT capital below the amount of depreciation built into base rates then, all other things being equal, Union would recover in excess of what was built into rates. If Union's capital expenditures were consistently below the amount of depreciation built into base rates then, all other things being equal and absent expenditures on expansion capital, rate base would decline.

This has not been the case to date over the IR term. EB-2005-0520 Maintenance/IT capital and depreciation were $200.5 million and $173.8 million, respectively. Over the period from 2008 to 2011, actual Maintenance/IT capital and actual depreciation averaged $241.8 million and $188.3 million, respectively. Further, the net utility plant component of rate base over the 2008 to 2011 period has increased by $337.2 million, relative to 2007 Board-approved.

Please see Attachment 1.

| Line No. | Particulars ($ millions) | 2007 Approved Budget EB-2005-0520 | Actual 2007 | Actual 2008 | Actual 2009 | Actual 2010 | Actual 2011 | Forecast 2012 | Forecast 2013 |
|---|---|---|---|---|---|---|---|---|---|
| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) |
| 1 | Expansion | 112.5 | 145.7 | 69.7 | -0.7 | 1.7 | 1.7 | 29.3 | 114.3 |
| 2 | Maintenance & IT | 235.5 | 199.9 | 228.7 | 226.1 | 225.0 | 287.2 | 251.3 | 261.9 |
| 4 | Total | 348.0 | 345.6 | 298.4 | 225.4 | 226.7 | 288.9 | 280.6 | 376.2 |
| 5 | Less: Unreg S&T | 0.0 | 1.5 | 2.2 | 0.5 | 5.9 | 13.1 | 3.0 | 2.2 |
| 6 | Less: Unreg General & Overhead | 0 | 1.4 | 0.4 | 0.9 | 1.2 | 1.3 | 2.5 | 2.3 |
| 7 | Total Regulated | 348.0 | 342.7 | 295.8 | 224.0 | 219.6 | 274.5 | 275.1 | 371.7 |
| 8 | Rate Base Reduction via ADR | 35.0 * | | | | | | | |
| 9 | | 313.0 | | | | | | | |
| 10 | Depreciation | 173.8 | 168.5 | 180.3 | 187.2 | 190.2 | 195.5 | 204.1 | 196.5 |

* For rate making, the rate base adjustment of $35.0 millon was considered distribution related.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Ref: Exhibit B1, Tab 2
Exhibit B1, Summary Schedule 2

What is the full year revenue requirement being recovered in Base Rates associated with the average under-spend amount in the period 2007 to 2012 inclusive to be provided in response to the preceding question?

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**Response:**

Base rates are not determined by capital spending but rather how they influence rate base. Please see Attachment 1 illustrating the revenue requirement that is not recovered through rates as a result of increases in rate base.

Please see the response at Exhibit J.B-1-14-6.

| Line No. | Particulars ($000's) | Board Approved 2007 | Actual 2007 | Actual 2008 | Actual 2009 | Actual 2010 | Actual 2011 | Forecast 2012 | Forecast 2013 |
|---|---|---|---|---|---|---|---|---|---|
| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) |
| | Gas Utility Plant | | | | | | | | |
| 1 | Gross plant at cost | 5,170,809 | 5,145,936 | 5,448,662 | 5,696,516 | 5,839,769 | 5,998,663 | 6,208,863 | 6,374,263 |
| 2 | Less: accumulated depreciation | 2,014,712 | 2,012,800 | 2,132,365 | 2,257,113 | 2,374,895 | 2,505,353 | 2,640,170 | 2,753,674 |
| 3 | Net utility plant | 3,156,097 | 3,133,136 | 3,316,297 | 3,439,403 | 3,464,874 | 3,493,309 | 3,568,693 | 3,620,590 |
| 4 | Change in net utility plant | | (22,961) | 183,161 | 123,106 | 25,471 | 28,435 | 75,383 | 51,897 |
| 5 | Debt component @ 4.71% (1) | | (1,081) | 8,627 | 5,798 | 1,200 | 1,339 | 3,551 | 2,444 |
| 6 | Equity component - preference shares @ 0.15% (2) | | (34) | 275 | 185 | 38 | 43 | 113 | 78 |
| 7 | Equity component - common @ 3.07% (3) | | (705) | 5,623 | 3,779 | 782 | 873 | 2,314 | 1,593 |
| 8 | Tax gross-up on equity portion | | 36.12% | 33.50% | 33.00% | 31.00% | 28.25% | 26.25% | 25.50% |
| 9 | Equity component gross-up (4) | | (418) | 2,971 | 1,952 | 368 | 361 | 864 | 572 |
| 10 | Total return on rate base (line 5 + line 6 + line 7 + line 9) | | (2,239) | 17,496 | 11,715 | 2,388 | 2,615 | 6,842 | 4,687 |
| 11 | Depreciation (5) | | (1,470) | 11,788 | 6,920 | 3,003 | 5,301 | 8,668 | 6,872 |
| 12 | Total revenue requirement | | (3,708) | 29,284 | 18,635 | 5,391 | 7,916 | 15,510 | 11,559 |
| 13 | Total cumulative revenue requirement | | (3,708) | 25,575 | 44,210 | 49,601 | 57,518 | 73,028 | 84,587 |

Notes:

(1) Exhibit A2, Tab 6, Schedule 1, Page 2, line 24, column (b)

(2) Exhibit A2, Tab 6, Schedule 1, Page 2, line 25, column (b)

(3) Exhibit A2, Tab 6, Schedule 1, Page 2, line 26, column (b)

(4) (line 6 + line 7) / (1 - line 8) - (line 6 + line 7)

(5) 2007 depreciation estimated using the 2008 average rate of 6.4%
2008-2012 represent the difference between years as shown on Exhibit D1 Summary Schedule 1 and expanded in J.D-1-14-1a)
2013 depreciation represents the difference between 2012 per Exhibit D1 Summary Schedule 1 and 2013 using 2004 rates as shown on Exhibit D1, Tab 6, Appendix A, page 1, line 3, column (b)

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit A2, Tab 1, Schedule 1, page 22

Please provide a detailed estimate of the impact in 2013 (relative to the last rebasing year in 2007) of the strong Canadian dollar on the cost of capital assets. Please describe the interaction, if any, between the impact on the Applicant's expenditures and the impact on the Applicant's revenues.

---

**Response:**

The impact of the rise in the value of the Canadian dollar relative to the U.S. dollar since 2007 has been to lower economic growth in the province, raise the level of unemployment and resulted in increased migration out of Ontario. The residential construction and manufacturing industry located in the Union's franchise area has been negatively affected by this economic downturn.

The average value of a Canadian dollar in U.S. funds in 2007 was 93 cents. In 2011 the average value was U.S. $1.01; this represents an appreciation of 8.6% over four years. The forecast to 2013 assumes that the Canadian dollar remains near parity trading in the $0.98 to $1.02 range.

The impact on Union's delivery revenues have been affected in the following markets:

- Residential market – fewer annual attachments and new billed customers
- Commercial market – less customer growth
- Industrial market – the number of customers has declined from plant closures

A macro analysis of the estimated foreign exchange impact on revenues is discussed below.

For the residential and commercial general service market this represents about 2,000-4,000 fewer customers annually. At approximately $400 per customer, the revenue loss over the past 4 years is estimated in the range of $3 to $6 million.

The total number of contract rate accounts since 2007 have declined by 41. The LCI market was the most affected with a decline of 53 accounts. Rate migration between contract and general service rates occurred over the period and nets to 14 fewer contract rate accounts in total and 18 in the LCI market. This implies 27 contract accounts in total and 35 LCI market accounts stopped their production and closed their business. The average LCI market account generates annually approximately $90,000 in delivery revenue. Consequently the revenue loss since 2007 is estimated around $3 million plus or minus $0.5 million.

Combining the estimated revenue impacts described above, the estimated delivery revenue impact for both the general service and contract rate markets is in the range of $5 to $10 million for the period 2007 to 2011.

For the period 2011 to 2013, the Union Gas revenue forecast assumes:

- Continued plant closures in the LCI contract rate market with the estimated impact over two years of approximately $1.5 million over 2 years.
- Housing starts remain below 2006 – 2007 levels with the estimated impact over two years of approximately $2.4 million.
- An exchange rate that trades near parity.

As a result of the stronger Canadian dollar, capital spending for 2013 is expected to be $5.6 million lower than it otherwise would have been. Short-term storage revenue is expected to be $0.3 lower while O&M expenses are expected to be $4.6 million lower than they otherwise would have been.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit B1, Tab 4, page 8

Please provide the Transportation Replacements actual spending for each of 2007 through 2011.

---

**Response:**

The table shows the Transportation Replacement actual spending for 2007 – 2011.

| ($ Millions) | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|
| Transportation Replacement Spending | $6.5 | $6.1 | $2.7 | $8.5 | $10.6 |

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit B1, Tab 4, page 9

Please provide the business case for the head office renovation.

---

**Response:**

Please see the response at Exhibit J.B-1-5-13.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit B1, Tab 6, page 2

Please provide the most up to date multi-year pipeline integrity plan, and if not included in that plan please update the 10-year IMP forecast to include 2011 through 2020.

---

**Response:**

Please see the response at Exhibit J.B-1-3-6.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit B1, Tab 6, page 2

Please provide the "integrated OMS" referred to, and any updates to it.

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**Response:**

Please see Attachment 1.

# Operations Management System Manual

# Performance Standards and Performance Guidelines

# Contents

# Management Commitment

Union Gas is committed to conducting business in a manner that protects the environment and the safety, health and security of our employees, contractors, customers and the public. This Operations Management System (OMS) describes the disciplined management system framework in use within Union Gas to ensure our commitment to managing risk, providing reliable service and achieving operational excellence.

This manual is the top tier documentation outlining the requirements and expectations that must be met by all areas within the organization that are included within the scope of the OMS. The OMS provides guidance through what has been defined as the 17 elements of operating at Union Gas. It is Union Gas' top tier manual and is an integrated approach to satisfy requirements of the CSA Z662-07 and intent of ISO9001, ISO14001, OHSAS18001 and PAS55. There are many benefits to this integrated approach including: a structured risk based decision making approach; clear roles, responsibilities and accountabilities; a complete review to assure compliance requirements are understood and met; and a foundation for a comprehensive business management system that ensures that what needs to be managed is being managed.

The requirements of the OMS are mandatory and shall be implemented in all areas of operations through various programs, manuals, procedures and operating instructions.

The top management and leadership team at Union Gas commit their support to implement, support, operate and maintain the OMS as described in this manual.

# Scope

As the Union Gas Tier I and II Operations Management System manual, this OMS sets the general requirements for work practices for all departments within the Engineering, Construction, STO and Distribution Operation Organizations. This part of the organization is referred to as “Corporate” throughout this manual.

The implementation of the OMS to the full lifecycle of assets including design, procurement, construction, operation and maintenance and decommissioning will be done in a staged approach starting in 2010.

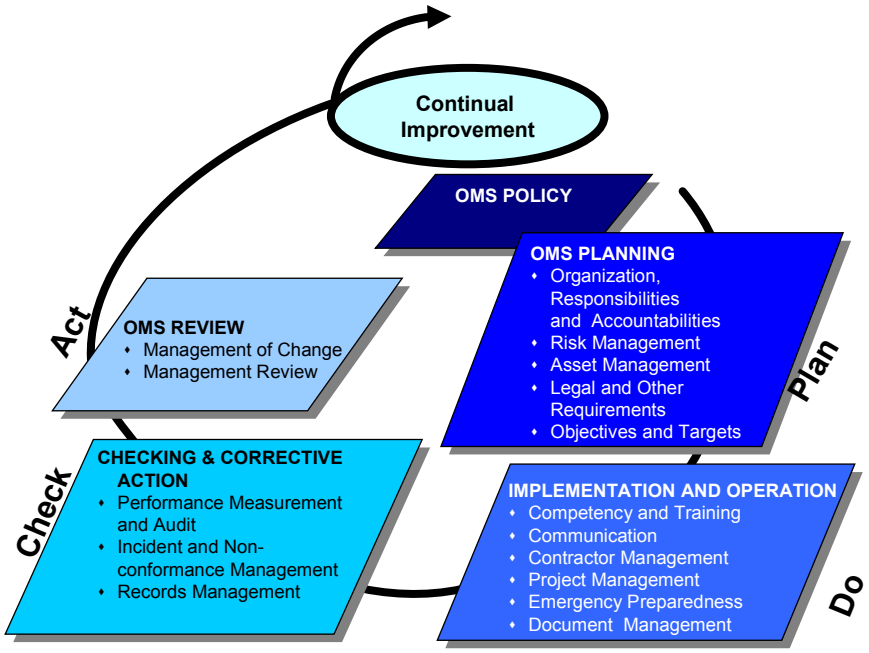
The initial implementation of the OMS will be incorporated as part of the Distribution System Integrity Management Program starting in April 2008.

# References

The Operations Management System framework has been developed as an integrated management system to manage multiple aspects of organizational performance.

The OMS is predicated on the underlying principal of striving for continual improvement through the implementation of the Plan-Do-Check-Act cycle, and has been designed to comply with the intent of the following standards:

- CSA Z662 Annex A Safety and loss management system
- ISO 9001:2000 Quality management systems
- ISO 14001:2004 Environmental management systems
- OHSAS 18001:2007 Occupational health and safety management systems
- PAS 55-1 Asset Management



# Element 1 - OMS Policy Implementation

*To describe the process for developing, maintaining, implementing and reviewing the OMS Policy. The OMS Policy is the driving force behind all Corporate activities and provides a clear vision of OMS performance expectations.*

### Tier I OMS Performance Standards

S1.1 Corporate shall develop an OMS Policy which specifies the Corporate vision and guiding principles of the OMS.

S1.2 Corporate shall review, implement and communicate the OMS Policy to ensure effectiveness.

### Tier 2 OMS Performance Guidelines

#### Development

G1.1 The OMS Leadership Team shall develop an OMS Policy that meets the intent of the following standard requirements:

- CSA Z662
- ISO14001
- ISO9001
- OHSAS 18001
- PAS 55

#### Communication

G1.2 The OMS Policy shall be made available and communicated to all relevant stakeholders through established communication methods, referenced in Element 8, *Communication*.

G1.3 The OMS Policy shall be referenced in relevant training programs. *Refer to Element 7, Competency and Training*.

#### Approval

G1.4 Top management shall approve and sign the OMS Policy.

#### Review

G1.5 The OMS Policy shall be reviewed, during the scheduled management review, for continued suitability, adequacy and effectiveness as referenced in Element 17, *Management Review*.

G1.6 Any revisions made to the OMS Policy will be made in accordance with Element 16, *Management of Change*.

# Element 2 - Organization, Responsibilities and Accountabilities

*To define and communicate the roles, responsibilities and authorities to effectively manage all aspects of the OMS. This standard describes the expectations for demonstrating management commitment to and support for the implementation and sustainment of the OMS for continual improvement.*

## Tier I OMS Performance Standards

S2.1 Corporate shall establish an OMS Leadership Team, consisting of top management, and others as appropriate, to provide and demonstrate visible leadership, oversight and strategic direction for the OMS.

S2.2 The OMS Leadership Team shall ensure that adequate resources are in place to fulfill the expectations set forth in the OMS Policy.

S2.3 The OMS Leadership Team shall appoint an OMS Management Representative with defined roles, responsibilities and authority to ensure the OMS is established, implemented and sustained.

S2.4 The OMS Leadership Team shall ensure that an accountable manager is assigned where required by the requirements of the OMS.

S2.5 Accountable managers shall demonstrate visible, active leadership and commitment in support of the OMS and continual improvement.

S2.6 All employees shall have defined responsibilities and accountabilities that are integrated into a performance management system.

## Tier 2 OMS Performance Guidelines

### Resources

G2.1 The OMS Leadership Team shall ensure the availability of resources essential to establish, implement and sustain the OMS. Resources include:

- human resources;
- specialized skills;
- organizational infrastructure;
- technology; and
- financial.

### OMS Leadership Team and Accountable Managers

G2.2 The OMS Leadership Team and accountable managers shall visibly demonstrate their commitment to supporting the OMS Policy, Performance Standards, Performance Guidelines and overall performance. Their commitment includes:

- Incorporating OMS requirements, where appropriate, in the Objective and Target setting process, including communicating performance against them;
- Stressing the importance of complying with the OMS and improving OMS performance;
- Promoting OMS initiatives and communicating OMS achievements;
- Participating in OMS meetings, audits and other activities, as appropriate;
- Including OMS topics in business planning, operational and general meetings;
- Encouraging open communication concerning OMS issues;
- Providing suggestions or ideas for improvement of OMS performance; and
- Taking appropriate action to improve OMS effectiveness.

G2.3 The OMS Leadership Team shall define and communicate the responsibilities of accountable managers for implementing and sustaining the OMS.

G2.4 Accountable managers shall ensure that roles, responsibilities and accountabilities are recorded and integrated into the performance management system and communicated.

### OMS Management Representative

G2.5 The OMS Management Representative, appointed by the OMS Leadership Team, is responsible for ensuring the OMS is established and maintained in accordance with the OMS Policy.

G2.6 The OMS Management Representative shall ensure that the performance of the OMS is reported to the OMS Leadership Team for review and continual improvement purposes. *Refer to Element 17, Management Review*.

### Employees

G2.7 The employee's role in ensuring success of the OMS is through:

- Participating in open communication concerning OMS issues;
- Providing suggestions or ideas for improvement of OMS performance; and
- Taking action to support the OMS in their role.

# Element 3 - Risk Management

*To outline risk management expectations and establish a Risk Management process to identify the Corporate risks that can be controlled or influenced. The purpose is to reduce or eliminate risks and maximize beneficial results using a systematic approach to decision making.*

## Tier I OMS Performance Standards

S3.1 Corporate shall establish and implement a performance guideline to identify, rank and manage risks.

S3.2 Corporate shall establish and maintain an Operations Control Table to consolidate risk assessment and controls from all Risk Registries.

S3.3 Accountable managers shall identify and rank the risks related to their operations in accordance with the performance guidelines.

S3.4 Accountable managers shall reasonably mitigate identified significant risks to acceptable levels in order to minimize adverse impacts to people, the environment, operations, finances, system reliability and Corporate reputation.

S3.5 Accountable managers shall record risk assessments and associated controls in their Risk Registries for annual review and consolidation into the Operations Control Table.

S3.6 Identified significant risks shall be used for input into the annual Objectives and Targets setting processes.

## Tier 2 OMS Performance Guidelines

### Accountability and Responsibility

G3.1 The OMS Management Representative shall establish the organization's Risk Management process.

G3.2 Corporate and accountable managers shall ensure compliance to the Risk Management process throughout their operations, including identification, analysis, assessment, evaluation, control, monitoring and review of risks.

### Risk Identification

G3.3 The OMS Management Representative and accountable managers shall identify the hazards to each area of operation that have resulted or may result in loss. Consideration should be given to normal operations, abnormal operations and potential emergency situations.

G3.4 When identifying hazards, the following sources of information should be considered where applicable:

- regulatory requirements
- standards and industry practices
- operating reports (inspection results, plant damage reports, outage reports etc.)
- OMS audit and compliance assessment results
- OMS Management Review outcomes
- employees

**Risk Analysis**

G3.5 Accountable managers shall gather information to identify sources and existing risk controls, and to develop an understanding of how the hazard poses a danger or a potential for loss to the organization.

G3.6 When analyzing hazards, consider all relevant consequence categories from the following:

- safety
- environmental
- finance
- customer impact
- reputation

G3.7 When analyzing hazards, consider the likelihood of occurrence, taking into account any objective frequency data or professional judgment.

**Risk Assessment**

G3.8 The accountable manager shall determine the risk level of each identified hazard using the Risk Matrix. The assessment shall be performed by combining the consequence and likelihood of each hazard.

- Identify all possible consequences and estimate the associated severity levels. The consequence with the highest severity shall take precedent for the assessment.
- Estimate the likelihood of the hazard occurrence based on available statistics and/or past experience.
- Assess the risk level for each hazard by finding the intersection of the highest severity consequence and likelihood of occurrence on the Risk Matrix.

### Risk Evaluation

G3.9 The accountable manager shall compare the risk level from the assessment with the "control requirements" and apply supplemental professional judgment if required to establish the final risk level. This supplemental judgment may include:

- a more detailed review of legal, economic, operational and stakeholder issues;
- a more comprehensive and/or quantitative assessment;
- applying the analysis to a more focused scope.

### Risk Control

G3.10 The accountable manager shall develop controls to lower the likelihood of occurrence and/or the severity of the consequence. The preference is to reduce the likelihood of occurrence where possible.

G3.11 The controls shall be developed and implemented to bring the risk to a level that is acceptable. All reasonable efforts should be made to implement controls based on the following hierarchy while taking into account the nature of the risk and financial considerations:

- elimination
- substitution
- engineering controls
- operating controls
- administrative controls (i.e. operating practices, processes and procedures, work instructions and signage)
- personal protective equipment and monitor effectiveness
- ensuring contingencies are in place to manage residual risk

G3.12 Accountable managers shall ensure that controls are communicated to their personnel.

G3.13 Employees and contractors are responsible for completing work in accordance with the appropriate controls and for notifying their manager of problems relating to those controls.

### Monitor and Review

G3.14 Accountable managers shall record the following information in their Risk Registry:

- hazard
- Risk Assessment Output (consequence level C1-C5, likelihood level L1-L5, Risk Level)
- professional judgment risk level refinement if appropriate
- existing risk controls
- additional controls if required

G3.15 Accountable managers are responsible for assessing adequacy of controls for significant risks through an annual review and revision of their Risk Registry, considering the following:

- employee feedback
- nonconformance trends
- significant change to organization
- legal and other changes
- industry changes

G3.16 On an annual basis the OMS Management Representative will consolidate all Risk Registries into the Operational Controls Table. The significant risks from this consolidation will be reviewed as part of the Element 17, *Management Review*.

G3.17 The OMS Leadership Team is accountable for assessing adequacy of controls for significant risks. Controls deemed to be inadequate shall be revised and implemented through Element 16, *Management of Change*.

G3.18 The OMS Management Representative shall organize a risk assessment review periodically to analyze overall Corporate risk. This will take into account that minor issues associated with a particular task, while not significant in themselves on a stand alone basis, may combine and result in an overall cumulative higher and potentially significant risk. The results of this review will feed into Element 17, *Management Review*

G3.19 Accountable managers with significant risks shall ensure that key performance measures and/or monitoring requirements are established.

G3.20 The OMS Management Representative shall ensure that key performance measures and/or monitoring requirements are established for Corporate significant risks.

## OMS Risk Matrix

approved Feb. 24, 2010 by OMS LT

| | | C1 | C2 | C3 | C4 | C5 |
|---|---|---|---|---|---|---|
| | | Consequence → | | | | |
| | INJURY | Minor illness / injury requiring first aid (employee / contractor / public) | Illness / injury requiring medical aid; OSHA recordable; restricted work | Lost time injury or equivalent | Permanent disability or public health hazard | Fatality or major public health hazard |
| | REGULATORY / LOSS OF CONTAINMENT | Minor regulatory non-compliance; administrative agency action | Regulatory non-compliance resulting in fines and penalties | Reportable regulatory exceedance with agency action and significant corrective action requirements; significant loss of containment in remote area | Significant agency action that limits operations for period of time; significant loss of containment in populated area | Significant agency action that permanently limits operations; significant loss of containment with potential human health or environmental impacts |
| | FINANCIAL / RELIABILITY | <$10k | $10k – $100k | $100k – $1M | $1M – 5M | >$5M |
| | REPUTATION | Isolated individual concern; no media attention | Community concern with short term local media attention | State / provincial concern; major interest group concern; regional media attention | Significant public response causing limited, short term impact on share price | Significant public response causing major impact on share price |
| | CUSTOMER IMPACT | <100 | 100-499 | 500-999 | 1000-5000 or major customer | >5000 or multiple major customers |
| Likelihood ↓ | | | | | | |
| L5 | ALMOST CERTAIN Expected to occur more than once per year at the facility / project | III | II | II | I | I |
| L4 | LIKELY Expected to occur several times in the facility / project lifetime | III | III | II | II | I |
| L3 | OCCASIONAL Expected to occur once in the facility / project lifetime | IV | III | III | II | II |
| L2 | RARE May occur in the facility / project lifetime. | IV | III | III | III | II |
| L1 | REMOTE Remote chance of happening | IV | IV | IV | III | III |

### Action Required

| RISK RANK | ACTION |
|---|---|
| I | Immediate action. The appropriate management level must be notified (as outlined in Incident Reporting and Investigation Standard and business unit procedures) and must approve continued operation. A short term risk mitigation plan must be implemented while enhanced long term controls are approved and implemented. |
| II | The appropriate management level must be notified (as outlined in Incident Reporting and Investigation Standard and business unit procedures). A plan for enhanced controls must be developed and approved by management. |
| III | The appropriate management level must be notified (as outlined in BU procedures). Controls must be reviewed to ensure they remain effective. |
| IV | No action required to enhance controls. |

## OMS Risk Registry and OMS Operations Controls Table Sample Template

| Hazard | Risk Assessment | | | Existing Controls | Professional Judgment Override | | Proposed Controls |
|---|---|---|---|---|---|---|---|
| | Likelihood | Consequence | Risk Level | | Comments | New Risk Level | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

# Element 4 - Asset Management

*To describe a process to optimally manage assets over their life cycle, balancing performance, risk and expenditures to achieve Corporate strategic objectives. Asset Management will demonstrate best value for money and an optimized return on investment and/or growth through efficient stewardship of assets. Asset Management decisions made in this manner will increase the level of objectivity, clarity and transparency.*

### Tier I OMS Performance Standards

S4.1 Corporate shall develop performance guidelines for the valuation and criticality review of all assets.

S4.2 Corporate shall strategically allocate funds based on the balance of performance, risk and cost of assets over their life cycle.

S4.3 Accountable managers shall make financial decisions based on asset management principles in accordance with the performance guidelines.

### Tier 2 OMS Performance Guidelines

#### Asset Valuation (existing and new)

G4.1 When valuing an asset, consider all life cycle data. This valuation provides quantitative results regarding an asset's contribution to revenues and profits.

G4.2 The valuation of a currently owned asset shall be assessed by considering its:

- location and operating environment;
- condition and operating performance;
- operational requirements;
- historical maintenance;
- revenue benefits;
- necessary preventive measures; and
- remaining useful life.

G4.3 The valuation for a potential new asset shall be assessed by considering:

- initial cost;
- revenue benefits;
- how the asset will perform during its life cycle; and
- the effect on other assets.

### Asset Criticality Review

G4.4 The criticality of existing and potential new assets shall be determined, considering:

- legal and other requirements;
- objectives and targets (including current and future business requirements); and
- risk management.

### Strategic Prioritization of Funds

G4.5 The strategic allocation of funds shall be made by balancing the output of the asset valuation and criticality review with available funds.

# Element 5 - Legal and Other Requirements

*To document the process used to identify, and provide access to, legal (legislative and regulatory) and other requirements applicable to Corporate activities and ensure compliance.*

## Tier I OMS Performance Standards

S5.1 Corporate shall establish, maintain, and ensure compliance to a Legal and Other Requirements Registry.

S5.2 Accountable managers shall validate and ensure compliance to the information contained within the Legal and Other Requirements Registry that is applicable to their operations.

S5.3 The Legal and Other Requirements Registry shall be reviewed annually.

## Tier 2 OMS Performance Guidelines

### Identification of Requirements

G5.1 The OMS Management Representative shall develop a Legal and Other Requirements Registry based on input from accountable managers.

G5.2 The legal department shall review and provide consultation where required for the Legal and Other Requirements Registry.

G5.3 The Legal and Other Requirements Registry shall include the following where relevant:

- Legal requirements such as federal, provincial and municipal regulations, operational permits and approvals, licenses and authorizations (e.g. TSSA, OEB, NEB, MOE, MOL, PEO);
- External standards and guidelines to be considered as non-mandatory guidance (e.g. CSA, ANSI, ASME, NIOSH, IAPA, ASHRAE, ISO);
- Other requirements such as industry associations (e.g. ORCGA, CGA, CEPA, NACE) and informational letters with which Corporate will conform as a matter of policy; and
- Internal standards and guidelines (Spectra Policy).

### Access and Communication

G5.4 The Legal and Other Requirements Registry shall identify where personnel can access the listed legal and other requirements.

G5.5 The Legal and Other Requirements Registry shall be communicated to applicable accountable managers identified as responsible for its review.

### Review of Legal and Other Requirements

G5.6 The Legal and Other Requirements Registry shall be reviewed at least annually.

G5.7 Accountable managers shall review the Legal and Other Requirements Registry to ensure significant changes to legal and other requirements are recorded in a timely manner prior to the annual review.

G5.8 The OMS Management Representative shall ensure that all relevant changes and pending changes in regulations/requirements are discussed during the OMS Management Review as per Element 17, *Management Review*.

### Updating Documentation

G5.9 The OMS Management Representative shall ensure that any changes to legal or other requirements are integrated into the OMS Manual, OMS Performance Standards, Performance Guidelines and associated documents as appropriate as per Element 16, *Management of Change*.

G5.10 Accountable managers shall ensure that any changes to legal or other requirements are integrated into their operating programs, practices, processes and procedures as appropriate as per Element 16, *Management of Change*.

G5.11 The legal department shall review and provide consultation where required for changes to the Legal and Other Requirements Registry.

### Evaluation of Compliance

G5.12 Accountable managers shall ensure compliance assessments are established and performed to ensure:

- compliance to all applicable legislation;
- conformance to all other requirements to which we subscribe; and
- verifiable data has been appropriately generated and maintained.

G5.13 Findings of compliance assessments shall be monitored in accordance with Element 14, *Incident and Nonconformance Management*.

G5.14 Information and results of compliance assessments shall be provided to the OMS Management Representative. *Refer to Element 17, Management Review*.

# Element 6 - Objectives and Targets

*To define the process for developing and reviewing Corporate objectives and targets consistent with the OMS Policy. This will ensure that Corporate objectives and targets are developed and properly documented, communicated, implemented and reviewed annually.*

### Tier I OMS Performance Standards

S6.1 Corporate objectives and targets shall be established, reviewed and approved by the OMS Leadership Team.

S6.2 Accountable managers shall develop, document and implement action plans in support of the Corporate objectives and targets.

## Tier 2 OMS Performance Guidelines

### Development of Objectives and Targets

G6.1 The OMS Leadership team shall annually establish Corporate objectives and targets, with input collected from the accountable managers, considering the following:

- long range strategic plans;
- OMS risks;
- legal and other requirements;
- technological options;
- financial, operational and business requirements; and
- views of stakeholders.

### Achieving Objectives and Targets

G6.2 The OMS Leadership Team is responsible for communicating the Corporate objectives and targets to all employees.

G6.3 Accountable managers are responsible for establishing and documenting departmental and individual objectives and targets that align with the Corporate objectives and targets.

G6.4 Accountable managers are responsible for establishing, documenting and communicating action plans to meet the objectives and targets. Action plans should include as a minimum:

- personnel responsibility (individual employee objectives);
- timeframes for achievement;
- specific, measurable actions for completion;
- resources; and
- mechanisms to track progress - indicators (leading and lagging indicators shall be considered).

G6.5 The status of objectives and targets shall be reviewed bi-annually by accountable managers.

**Year End Review of Objective and Targets**

G6.6 Established Corporate objectives and targets will be reviewed by the OMS Leadership Team. The results of this review will be documented and incorporated into the Management Review process. *Refer to Element 17, Management Review*.

# Element 7 - Competency and Training

*To ensure that training needs for all critical roles are identified and processes are established to verify the competency of those performing these functions. This is accomplished through a training needs assessment which lists the knowledge and/or skills a person must have to competently perform the key job tasks within the identified critical role.*

## Tier I OMS Performance Standards

S7.1 Corporate shall ensure that training needs associated with critical roles are identified, developed, delivered and validated as required.

S7.2 Accountable managers shall conduct a training needs assessment of the key job tasks for critical roles within their areas

S7.3 Accountable managers shall ensure that training associated with critical job tasks are developed, delivered and validated through competency assessments.

## Tier 2 OMS Performance Guidelines

### Identifying Training Needs

G7.1 The OMS Management Representative shall conduct a training needs assessment to identify the type, audience and frequency of OMS training required for Tier I and Tier II processes.

G7.2 Accountable managers shall conduct a training needs assessment for key job tasks within each critical role to determine the necessary knowledge, skills and experience requirements, and shall train as appropriate, considering the following:

- applicable legal and other requirements
- significant risks applicable to work being performed
- employee feedback

G7.3 Accountable managers are required to periodically assess individuals (employee, contractors) against the results of the training needs assessment for their role.

### Training Development and Delivery

G7.4 When developing training, the following content and factors should be considered and included where applicable:

- OMS Policy
- legal and other requirements
- risks applicable to the work being performed
- operational controls (aligns with applicable programs, processes, practices and procedures)

- roles and responsibilities
- audience analysis (e.g. ability, language skills, literacy)
- delivery methods (e.g. classroom instruction, on the job training, computer based training or videos)

G7.5 Training shall include:

- stated objectives;
- methods for determining successful completion of training, such as written or verbal tests, hands on demonstrations, observation of work practices or attendance;
- procedures for dealing with unsuccessful completion of training;
- established requirements for initial and refresher training;
- training content and materials documented as per Element 12, *Document Management*; and
- training delivery records (e.g. tests, attendance record) recorded as per Element 15, *Records Management*.

G7.6 Accountable managers shall ensure that all personnel have received required training as specified in the training needs assessment.

**Training Evaluation**

G7.7 Where appropriate, personnel shall be tested to determine whether the appropriate knowledge and skills were acquired through training.

G7.8 Training effectiveness shall be evaluated primarily through the use of professional judgment of supervisors and managers and the analysis of incident/nonconformity reports to determine if training or lack thereof was a contributing cause.

G7.9 Feedback should also be obtained periodically from employees concerning the effectiveness, quality and appropriateness of the training provided.

G7.10 Accountable managers shall ensure that adequate knowledge, skill and experience have been retained for critical tasks through competency assessment.

G7.11 Competency assessments should identify the evaluator, the knowledge and skills evaluated, a minimum level of successful demonstration and the demonstration of the personnel being assessed, and should be conducted at a reasonable time interval after training.

G7.12 Personnel who do not demonstrate the minimum level of competency required must stop performing the critical job task until they can demonstrate competency.

G7.13 Records of competency assessments shall be retained by accountable managers.

# Element 8 - Communication

*To define the key requirements, responsibilities and methods for communicating information to internal and external stakeholders; information may pertain to the OMS, including performance and risks that may affect employees, the community and other stakeholders.*

### Tier I OMS Performance Standards

S8.1 Corporate and accountable managers shall have effective methods for communicating relevant OMS information to appropriate levels of the organization.

S8.2 Corporate shall establish guidelines for communicating relevant OMS information to external stakeholders and responding to their inquiries.

S8.3 Accountable managers shall establish processes to communicate relevant OMS information to external stakeholders and respond to their inquiries.

### Tier 2 OMS Performance Guidelines

#### Communication Guidelines

G8.1 When developing effective communication, consider the following:

- scope
- audience requirements
- internal review requirements
- impact to business reputation
- purpose of the communication
- action required
- key message
- tools and additional context

#### Communication to Internal Stakeholders

G8.2 Corporate and accountable managers shall communicate OMS information to various levels of the organization as appropriate. Effective methods of communication to personnel may include:

- intranet site
- newsletters
- emails
- presentations
- training
- meetings (departmental, one on one, Town Hall, conference calls, contractor site etc.)

- bulletin boards
- annual reports

G8.3 Internal communication may include the following types of relevant information:

- OMS Policy
- operational risks
- operational controls
- objectives and targets
- new or changing circumstances (legal and other requirements, organizational and operational changes, etc.)
- responses to concerns of internal and external stakeholders

G8.4 The Public Affairs Department should be consulted before the release of internal communications, where necessary.

G8.5 Employees are encouraged to give their input, opinions or suggestions for improvement on issues related to the OMS. This may be done through:

- their manager
- employee surveys/feedback
- performance reviews
- management of change mechanisms (PEMR, DOAR etc.)
- employee suggestion form
- help lines (Ethics Line, Fleet and Facilities help lines, etc.)

G8.6 The effectiveness of internal communication methods should be evaluated periodically and may be accomplished through employee surveys, internal audits or informal discussions.

**Communication to External Stakeholders**

G8.7 Corporate shall establish protocol for sharing information with various external stakeholders, such as:

- shareholders
- general public
- media
- regulators
- government
- customers
- emergency response agencies
- industry associations
- suppliers
- other companies
- others as appropriate

G8.8 External communication may include the following types of relevant information:

- OMS Policy
- operational risks, as required
- overview of the OMS
- responses to concerns
- performance reports

G8.9 Typical methods used for communication with external stakeholders may include:

- Union Gas internet site
- media releases (newspaper, radio, etc.)
- publications
- verbal communication (teleconference, interview, meetings)
- written (email, letters, reports, bill inserts, etc.)
- Open House events
- tours
- performance reports
- community newsletters and pamphlets

G8.10 The Public Affairs Department should be consulted before the release of communications to external stakeholders, where necessary.

**Inquiries from External Stakeholders**

G8.11 Relevant inquiries or requests for information regarding the OMS from external stakeholders shall be forwarded to the accountable manager. The accountable manager shall keep records of external inquiries.

- Response to a complaint shall include assurance that an investigation will be carried out, corrective action will be taken, if deemed necessary, and information about the outcome of the investigation will be communicated as soon as possible.
- Inquiries from the media shall be transferred to the appropriate media spokesperson within the organization.
- If it is determined that there is a regulatory, legal, or contractual requirement to provide information to an external stakeholder, the appropriate internal departments shall be consulted.

G8.12 When a response to external stakeholder is required, it must be timely, accurate and consistent with responses made to similar inquiries. If a response cannot be made in a timely fashion, the stakeholder should be notified of the delay and provided with an estimated response time.

# Element 9 - Contractor Management

*To ensure that contractors are evaluated and selected on the basis of the contractor's ability and qualification to perform the specified duties in a quality, safe, environmentally sound and cost effective manner.*

## Tier I OMS Performance Standards

S9.1 Accountable managers shall ensure that contractors are selected and managed in a manner consistent with the intent and expectations of established Performance Guidelines.

## Tier 2 OMS Performance Guidelines

### Contractor Management Program

G9.1 Contractor management programs shall include the following:

- Contractor Evaluation and Selection (Pre-Qualification Process)
- Contractor Communication
- Contractor Oversight (Performance Tracking and Evaluation)
- Contractor Performance

G9.2 Accountable managers shall ensure the following contractor service processes are documented and records are kept:

**Contractor Evaluation and Selection (Pre-Qualification Process)**

- Obtain and evaluate information regarding a contractor's quality, safety and environmental policies, procedures and performance.
- Award contracts based on selection criteria, which should consider bid requirements, past performance, background checks, use of existing contracts, performance history, emergency scenarios, cost etc.

**Contractor Communication**

- Communicate contract requirements and expectations (e.g., mobilization meetings, tailgate meetings, orientation etc.).

**Contractor Oversight**

- Ensure verification of contractor employee abilities and qualifications. Verification methods may include audits, worksite inspections, observations of employee performance etc.

### Contractor Performance

- Develop process for monitoring and assessing contractor performance, providing feedback to contractors on their performance, where necessary, and addressing any deficiencies in contractor services.

# Element 10 - Project Management

*To ensure that projects are managed in order to achieve the stated objectives of the project through appropriate planning, organization, control, reporting and review of all aspects of the project*

### Tier I OMS Performance Standards

S10.1 Accountable managers shall ensure that projects are managed in order to achieve their stated objectives in a manner consistent with the intent and expectations of established performance guidelines.

### Tier 2 OMS Performance Guidelines

#### Project Management

G10.1 Project Management shall include the following principals:

- Initiation and Planning
- Design and Develop
- Implement and Execute
- Project Change Control
- Project Closure

G10.2 Accountable managers shall ensure the following project management principles are followed:

**Initiation and Planning**

A project plan shall be developed which documents the following:

- Project Overview (e.g. goals, objectives, scope, benefits, risks etc.)
- Resources (e.g. budget, people, equipment)
- Roles and Responsibilities (e.g. management oversight and governance, stakeholders)
- Timelines (e.g. key milestones, start and end dates)

**Design and Develop**

The following shall be considered or performed:

- Secure resources, confirm roles and responsibilities, and communicate project plan.
- Establish project logistics, tasks, and timelines
- Confirm business requirements.
- Develop plans for implementation, communication, training and sustainment.
- Develop test plans (pilots, run modeling, dry run, focus group, etc.).
- Verify risks.

### Implement and Execute

The following shall be considered or performed:

- Manage scope, timelines and resources.
- Monitor and control risks.
- Communicate project plan (procedure of work, tailgate talks etc.).
- Track and document the project's progress at key milestones against its stated objectives.
- Identify and document significant problems and their corrective actions.

### Project Change Control

Ensure the following:

- Project changes are reviewed, verified, validated against the project output, and approved prior to implementation.

### Project Closure

Project closure documentation should include:

- a commissioning and sustainment plan;
- lessons learned; and
- project documents and records.

in accordance with Element 16, *Management of Change* and Element 15, *Records Management*.

# Element 11 - Emergency Preparedness

*To identify the potential for and plan the response to incidents, emergency situations and security threats to prevent and mitigate any adverse effects that may result. Roles, responsibilities and authorities are identified to effectively facilitate the company's emergency preparedness.*

### Tier I OMS Performance Standards

S11.1 Corporate shall develop and maintain Corporate emergency preparedness plans to respond effectively to crisis situations.

S11.2 Accountable managers shall be prepared as required to facilitate adequate response to crisis situations.

## Tier 2 OMS Performance Guidelines

### Identification of Crisis Situations

G11.1 Corporate shall identify the potential for emergencies, security threats and related business disruption. Emergency preparedness shall include:

- Emergency Response Plans;
- Business Continuity Response Plans; and
- Security Threat Response Plans.

G11.2 This identification shall be based on historical knowledge of incidents, security intelligence and the OMS Risk Registry. *Refer to Element 3, Risk Management.*

### Development of Plans and Documentation

G11.3 Corporate emergency preparedness plans shall be prepared and maintained, under one authority, outlining protocols for response to specific types of crisis situations.

G11.4 Emergency preparedness plan requirements should be documented and accessible to all staff involved in activities or processes that could result in response to crisis situations. The documentation described in this clause should include the following:

- Description of anticipated crisis scenarios;
- A response management system consisting of: response organizations and facilities, roles, responsibilities and authorities, and lines of communication;
- Description of actions that should be taken when a crisis situation is suspected, including procedures for activating appropriate warning and response systems and emergency-specific action plans to address the immediate situation and potential illness or injury;

- Description of arrangements with external agencies such as police and fire departments, hospitals, contractors and government emergency response teams, if appropriate;
- Lists of current contacts, and protocols for notification of appropriate internal and external parties;
- Lists of available resources (specialist assistance and equipment);
- Evacuation plans, signals and routes of escape if applicable;
- Identification of relevant response training;
- Record keeping requirements;
- Identification of government requirements referencing applicable regulation or legislation.

**Communication**

G11.5 Corporate shall communicate relevant emergency preparedness information to appropriate internal and external stakeholders as required.

**Training**

G11.6 Corporate shall ensure that all appropriate personnel are adequately trained with regard to emergency preparedness responsibilities and procedures according to Element 7, *Competency and Training*.

**Testing of the Plans**

G11.7 Corporate must test its emergency preparedness plans at pre-established timeframes, involving relevant stakeholders as appropriate.

G11.8 Corporate shall record the findings of the test.

**Reviewing / Revising the Plan**

G11.9 Corporate must review, and revise if necessary, its emergency preparedness documentation

- at pre-established timeframes;
- after periodical testing; and
- after the occurrence of crisis situations.

G11.10 Any issues or deficiencies identified through reviews and/or testing must be documented and tracked according to Element 14, *Incident and Nonconformance Management.*

# Element 12 - Document Management

*To define the requirements, responsibilities and processes for ensuring that the OMS and associated documents are prepared, reviewed, approved, issued, distributed, revised and archived in a controlled manner, and that these documents are available at all locations where operations essential to the effective functioning of the OMS are performed.*

## Tier I OMS Performance Standards

S12.1 Corporate shall determine and document the main elements of the OMS and their interaction and reference to related documentation.

S12.2 Accountable managers shall establish, document and maintain the linkages that describe their related programs and documentation to the OMS.

S12.3 Corporate shall establish and maintain performance guidelines for managing (e.g. identification, maintenance, retention, review and disposition) all documents related to the OMS.

## Tier 2 OMS Performance Guidelines

### OMS Interaction

G12.1 A listing of controlled and referenced Tier I and Tier II documents will be identified in an OMS Master Document List.

G12.2 A listing of controlled and referenced Tier III documents shall be identified and provided by the accountable managers to the OMS Management Representative.

### Level of Documentation

G12.3 The requirement for documentation shall be proportional to the level of complexity, risks, and legal and other requirements concerned. Documentation should be kept to the minimum required for effectiveness and efficiency.

### Controlled Documents

G12.4 Each controlled document must bear a unique identification, issue date, and revision date, and must show approval where appropriate.

G12.5 Each controlled document must remain legible and be readily identifiable and retrievable.

### Approval

G12.6 Controlled OMS documents must be reviewed and approved by appropriate personnel for adequacy prior to use.

G12.7 All OMS Tier I and Tier II documents require the approval of the OMS Management Representative.

G12.8 All OMS Tier III documents require the approval of the accountable manager.

**Distribution**

G12.9 Hard copy controlled Tier I and Tier II documents will not be distributed. Controlled documents will be available through the OMS Intranet site.

G12.10 Controlled Tier III documents must be made available where it is essential to the effective functioning of the OMS through means determined by the accountable manager generating the document. The accountable manager should ensure that current versions are available in appropriate format at the locations where the work is performed.

**Review / Revisions**

G12.11 OMS Tier I and Tier II documents shall be reviewed annually and where necessary revised, taking into account any internal and external input.

G12.12 OMS Tier III documents will be reviewed on a pre-established timeframe defined by the accountable manager.

**Documents of External Origin**

G12.13 Documents of external origin deemed to be necessary for the planning and operation of the OMS shall be identified as controlled documents and distributed by the accountable manager.

**Obsolete Documents**

G12.14 Obsolete documents shall be handled in the following manner:

- Invalid and/or obsolete controlled documents must be promptly removed from all points of issue or use, or otherwise ensured against unintended use.
- Invalid and/or obsolete documents must be marked as such. When obsolete documents are archived, they must be identified as obsolete and retained pursuant to Element 15, *Records Management*.

# Element 13 - Performance Measurement and Auditing

*To define the requirements, responsibilities and processes for monitoring and measuring performance related to Risk Management, Objectives and Targets, Asset Management and Legal and Other Requirements, and conducting periodic audits against the stated requirements of the OMS. The intent is to identify trends and factors for continual improvement.*

## Tier I OMS Performance Standards

S13.1 Corporate shall monitor and measure overall performance through analysis of data associated with *Risk Management, Objectives and Targets, Asset Management and Legal and Other Requirements.*

S13.2 Accountable managers shall monitor and measure performance in their respective areas through analysis of data associated with *Risk Management, Objectives and Targets, Asset Management and Legal and Other Requirements*.

S13.3 Corporate shall establish requirements that ensure periodic OMS audits to assess compliance to the stated requirements of the OMS are conducted.

S13.4 Accountable Managers shall provide for the participation in and/or the conducting of audits as deemed necessary.

## Tier 2 OMS Performance Guidelines

### Performance Measurement

G13.1 Corporate shall assign accountability for monitoring and measuring key performance indicators (KPI) associated with *Risk Management, Objectives and Targets, Asset Management and Legal and Other Requirements*.

G13.2 Accountable managers shall ensure that the information collected is reliable. Any monitoring equipment used for verifying the key performance measures shall be calibrated, and records of that calibration shall be kept. Any processes used to verify KPI shall be validated.

G13.3 Compiled results, data and information shall be evaluated and analyzed periodically, or as prescribed by regulation, to:

- identify any trends, reoccurring types of issues and/or common causal factors;
- compare performance to previously gathered data to determine performance improvements; and
- monitor the adequacy of the performance results.

G13.4 Recurring and significant issues, trends, and common areas of concerns will be incorporated into the Element 17 Management Review process.

**OMS Audits**

G13.5 The OMS Management Representative will implement and maintain an OMS Audit Program that details the scheduling and conducting of periodic audits of the OMS to ensure that the OMS has been properly implemented and maintained.

G13.6 The OMS Management Representative shall ensure that OMS audits are prioritized based on the trends identified through the key performance indicators, previous audit results and OMS Leadership Team input.

G13.7 Accountable managers shall support and participate in OMS audits in accordance with the OMS Audit Program. Participation may include:

- ensuring adequate resources
- audit planning
- audit response and corrective action plans including evidence of closure

G13.8 OMS audits shall be performed by appropriately trained personnel.

G13.9 Findings of OMS audits shall be monitored in accordance with Element 14, *Incident and Nonconformance Management*.

G13.10 Information and results of OMS audits shall be provided to the OMS Leadership Team as part of Element 17, *Management Review*.

# Element 14 - Incident and Nonconformance Management

*To establish the requirements for ensuring incidents and nonconformances are identified, investigated, corrected to prevent recurrence, tracked to closure and reviewed for effectiveness.*

## Tier I OMS Performance Standards

S14.1 Corporate and accountable managers shall document and implement processes to ensure that incidents and actual or potential nonconformances are identified.

S14.2 Corporate and accountable managers shall investigate incidents and nonconformances to develop corrective and preventive action plans. These plans shall be communicated, implemented and periodically assessed for effective and timely closure of the nonconformance.

## Tier 2 OMS Performance Guidelines

### Identification and Documentation of Incidents and Nonconformances

G14.1 Incidents may be identified through various processes, including:

- Preliminary incident reports
- Plant damage reports
- Injury/accident reports
- Employee communications
- Customer/public communications

G14.2 Actual and potential nonconformances may be identified through various processes, including:

- audits
- management reviews
- performance measurement (KPIs)
- inspections
- training needs assessments
- competency assessments
- employee comments/requests
- communications from stakeholders, etc.

G14.3 Accountable managers shall use professional judgment to determine if an incident or nonconformance is part of a systemic issue, or may cause a significant impact and therefore needs to be tracked through the use of a formal documented system.

- All other nonconformances may be addressed informally and do not require formal documentation. Methods of addressing nonconformances informally include, but are not limited to, email, voice mail, direct communication with area management etc.

G14.4 Formal incident and nonconformance documentation should include the following:

- description of nonconformance;
- recommendations to correct nonconformance and to prevent its recurrence;
- specific action items to address recommendations; and
- recommended responsibilities, timeframes and resources for completion.

**Corrective and Preventive Action Plans for Incidents and Nonconformances**

G14.5 Accountable managers shall ensure a formal corrective or preventive action plan includes:

- actions to mitigate any risks caused by the incident or nonconformance;
- a root cause analysis of the incident or nonconformance;
- corrective or preventive measures which are appropriate to the magnitude of problem(s) and are commensurate with the risk encountered;
- a review of the corrective or preventive measures to determine if it creates a new or significant change to a risk assessment;
- identification of operating procedures and other documentation to be modified, as required;
- assignment of responsibilities for completion; and
- establishment of appropriate timeframes for completion.

G14.6 Accountable managers shall ensure that corrective and preventive action plans are communicated to appropriate personnel for their achievement.

**Tracking Corrective and Preventive Actions**

G14.7 Accountable managers shall ensure corrective and preventive actions are tracked including reports on progress towards closure of the identified actions.

G14.8 Accountable managers shall ensure that corrective and preventive actions have been completed prior to closure.

### Effectiveness of Corrective and Preventive Actions

G14.9 Accountable managers shall review all incidents and nonconformances in their area to identify trends and assess if the corrective and preventive actions are effective. Further corrective and preventive actions shall be taken to address and resolve any trends identified.

# Element 15 - Records Management

*To define the requirements, processes and responsibilities for the retention and disposition of OMS records. Further, to ensure that essential records are maintained and secured so as to remain valid, legible, retrievable and traceable.*

## Tier I OMS Performance Standards

S15.1 Corporate shall establish and maintain performance guidelines for managing the identification, storage, protection, retrieval, retention and disposition of all records.

S15.2 Accountable managers shall manage the identification, storage, protection, retrieval, retention and disposition of all records related to Tier III documentation in accordance with Corporate performance guidelines.

## Tier 2 OMS Performance Guidelines

### Maintenance of OMS Records

G15.1 Records associated with the OMS shall be maintained to demonstrate compliance to the established Corporate performance guidelines.

G15.2 Where appropriate, a security level designation (e.g., “Controlled”, “Protected-Proprietary”, “Secret”, “Privileged and Confidential”, “Protected-Commercial”) should be assigned to relevant records.

### Identification

G15.3 It is the responsibility of the accountable manager defining the use or requirement for the record to ensure that it is identifiable (e.g. labelled through a defined numbering system).

G15.4 Owners of external documents shall use professional judgment in deciding whether a document received from an external organization is obsolete but should be retained as a record.

### Traceability

G15.5 It is the responsibility of the accountable manager defining the use or requirement for the record to ensure that it is traceable to its respective OMS documentation.

### Legibility

G15.6 OMS records shall be legible.

### Collection

G15.7 Records generated from Tier I and Tier II documents will be collected as stated on an OMS Document Master List.

G15.8 It is the responsibility of the accountable manager defining the use or requirement for the record to identify whether the record is to be collected and retained.

### Storage and Protection

G15.9 All records shall be properly stored so that they are retrievable and adequately protected from damage, deterioration and loss (e.g. security, fire protection and backup).

G15.10 Access to records shall be restricted as appropriate.

### Record Retention

G15.11 The OMS Management Representative shall identify on an OMS Document Master List the retention time for each type of record generated from Tier I and Tier II documents.

G15.12 Accountable managers shall specify record retention times for Tier III records generated.

### Disposal

G15.13 Records shall be disposed of at the end of the specified retention period unless the accountable manager authorizes that a record be stored for a longer period of time.

# Element 16 - Management of Change

*To describe the methods for managing the implementation of a change and accounting for how the decision to make the change was reached. This standard ensures that critical aspects are properly considered prior to implementing the change, and that all changes provide the intended benefits while minimizing health, safety, environmental, quality and business risks. Changes governed by this standard pertain to plant and facilities, procedures, materials, construction, operations, equipment, information technology and organizational changes.*

## Tier I OMS Performance Standards

S16.1 Corporate shall establish and implement the requirements for the management of change.

S16.2 Accountable managers implementing a change must ensure management of change requirements are met.

## Tier 2 OMS Performance Guidelines

### Management of Change Applicability

G16.1 The Management of Change process shall be applied to the following:

- new projects/programs;
- plant and facilities additions or modifications;
- tool, equipment and fleet additions or modifications;
- Policy, Practice, Process and Procedure additions and modifications;
- information technology additions or modifications;
- decommissioning;
- acquisition and divestitures;
- plant environment changes (e.g. class location change, pipeline crossing);
- organizational changes;
- legal and other requirements (changes and additions).

G16.2 Management of change does not apply to the replacement of an item with a similar item having the same specifications as the item being replaced, replacement in kind, providing the alternative does not in any way adversely affect the use of the item.

### Management of Change Process

G16.3 The Management of Change process shall include appropriate documentation of:

- identification of the changes;
- setting responsibility and authorities for the review, approval, and implementation and sustainment of changes;
- reasons for the changes;
- analysis of potential implications and effects of the changes;
- implementation plans;
- communication of changes to affected parties.

### Identification of Changes

G16.4 Accountable managers must describe the change in the context of the applicability statements in 16.1.

G16.5 Accountable managers must identify if the change is emergency or temporary in nature.

### Setting Responsibility and Authority

G16.6 Accountable managers implementing a change shall ensure that

- key stakeholders have been identified for required review and/or approval (e.g. EHS, Engineering, Finance); and
- appropriate approvals have been secured.

### Documentation of Reasons

G16.7 Accountable managers implementing a change shall ensure that the reasons for the change (e.g. compliance, reduce risks, reduce costs, increase revenue) are adequately documented and maintained in accordance with Element 15, *Records Management*.

### Analysis of potential implications and effects of change

G16.8 Accountable managers implementing a change shall ensure that the following are documented in the analysis where applicable:

- risk assessment
- cost benefit analysis
- employee impact
- procedural revisions
- training requirements
- legal and other requirements

### Implementation and Sustainment Plans

G16.9 Accountable managers implementing a change shall develop an implementation plan that identifies:

- responsibilities and accountabilities;
- timing; and
- resources (employees, contractors, budget).

G16.10 Accountable managers implementing a change shall ensure that a sustainment plan has been developed which identifies long term ownership.

### Communication of Changes

G16.11 Accountable managers implementing a change shall ensure that all affected parties (employees, union leadership, contractors, suppliers, other stakeholders) are informed using a communication plan that outlines who, what, where, when, timing, procedures, training.

### Emergency Changes

G16.12 Where a change must be made in cases that represent an immediate danger to life, property, or the environment, the normal sequence of actions for the management of change process may be adapted to meet the situation.

- Accountable managers shall obtain interim approval for technical changes, and reasonably communicate and train affected personnel prior to implementation.
- All emergency changes shall be documented and must include the planned duration and any information and procedures necessary to safely implement the change.
- Emergency changes that are intended to remain permanent shall be scheduled for the normal management of change process as soon as practicable.

### Temporary Changes

G16.13 All temporary changes shall follow the management of change process and will outline a duration for which the change is effective.

G16.14 Temporary changes to procedures shall be documented as follows:

- marked "TEMPORARY"
- include specified expiration date or date when a pre-defined terminating condition is satisfied
- include all the sections and standards required in permanent procedures
- may be handwritten if the writing is clear and legible

# Element 17 - Management Review

*To describe the process by which the OMS is periodically reviewed by top management to ensure its continuing suitability, adequacy and effectiveness. The review addresses the potential need for changes to OMS Policy, performance guidelines and standards based on the results of audits, changing circumstances and the commitment to continual improvement.*

### Tier I OMS Performance Standards

S17.1 The OMS Leadership Team is responsible for an annual management review and, where necessary, amendment of the OMS.

### Tier 2 OMS Performance Guidelines

#### Preparation for Review

G17.1 The OMS Leadership Team is responsible for selecting appropriate individuals to participate in the OMS Management Review.

G17.2 The OMS Management Representative is responsible for coordinating and scheduling the OMS Management Review.

G17.3 The OMS Management Representative is responsible for coordinating, collecting, and analyzing the information necessary to conduct a review of the OMS performance, including the following:

- significant risks of the organization;
- the extent to which the Corporate objectives and targets have been met;
- any changes (internal or external) that may affect the OMS, such as developments in legal and other requirements, organizational changes etc.;
- results of OMS audits and evaluations of compliance;
- relevant communication from internal stakeholders;
- relevant communications from external stakeholders, including any complaints;
- status of incident reviews, corrective and preventive actions;
- follow-up actions from previous management reviews; and
- recommendations for improvement.

G17.4 The OMS Management Representative is responsible for selecting any additional information to be presented at the review, which may include the following:

- revisions to OMS documentation
- views of internal and external stakeholders
- new and emerging issues of relevance

### Conducting the Review

G17.5 The OMS Leadership Team is responsible for assessing, at a minimum, the following items for continual improvement:

- OMS Policy;
- Corporate objectives and targets;
- performance monitoring activities, corrective actions and audit results;
- changing circumstances such as designated responsibilities, organizational structure and other required alterations to the OMS;
- OMS documentation; and
- resources to sustain the OMS and implement any modifications.

### Preparation of the Management Review Meeting Minutes

G17.6 The OMS Management Representative is responsible for preparing the meeting minutes, within a reasonable timeframe. The meeting minutes will summarize the findings and recommendations for action, and will designate responsibilities.

G17.7 The OMS Management Representative is responsible for circulating the meeting minutes to the OMS Leadership Team and others as required.

### Actions Resulting from Review

G17.8 The OMS Management Representative is responsible for ensuring that adequate communication and consultation is provided to those accountable managers responsible for implementing actions resulting from the review.

G17.9 The OMS Management Representative is responsible for monitoring the implementation of actions by accountable managers.

G17.10 If it is determined that there is a need for corrective action, the OMS Management Representative shall follow Element 14, *Incident and Nonconformance Management*.

G17.11 Any changes to the OMS shall be implemented in accordance with Element 16, *Management of Change*.

# Definitions

**Acceptable Risk** - a risk that has been reduced to a level that can be tolerated by the organization having regard to its legal obligations and it own OMS policy.

**Accountable manager** - a person having authority over the financial and/or personnel resources of a Corporate function (e.g. a facility, process, project or program).

**Adequate** - is sufficient, legally or reasonably, for the requirements.

**Asset(s)** - plant, facilities, fleet, property and other items and related systems that have a distinct and quantifiable business function or service.

**Audit** - a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.

**Business continuity** - the ability for key operations to continue without stoppage, irrespective of the adverse circumstances or events.

**Business Continuity Response Plans** - means responding to disruptions to critical or essential business functions.

**Change** - any addition, deletion or rearrangement of resources, process, technology, environment, equipment, organization, facilities and tools. This excludes routine operations where changes occur within specified ranges and/or planned modifications are applied (e.g. temperature, pressures, replacement in kind or concentration).

**Certification** - the authoritative act of documenting compliance with agreed requirements. A verification of qualification at a set point in time with an established expiry cycle.

**Communication** - two-way process of reaching mutual understanding, in which participants not only exchange information but also create shared meaning.

**Compliance** - a judgment that the requirements of a specific standard are met or exceed the letter of all applicable requirements specified in a law, regulation, code, standard, contract or other legally binding document.

**Continual improvement** - a set of activities that an organization routinely carries out in order to enhance its ability to meet requirements. Continual improvement can be achieved by carrying out internal audits, performing management reviews, analyzing data and implementing corrective and preventive actions.

**Competency** - the demonstrated ability to apply knowledge, skills and/or experience.

- Knowledge - refers to the factors, concepts, principles, rules, policies, process and information that a person must apply to the core functions of their role (quantitative).
- Skills - refers to the aptitude and the ability to complete a task (qualitative).
- Experience - refers to the cumulative application of knowledge and skills to core tasks.

**Compliance Assessment** - an evaluation performed to ensure compliance to legal and other requirements.

**Corrective action** - an action taken to eliminate the causes of an existing nonconformity, defect or other undesirable situation to prevent recurrence.

**Corporate** - in this manual refers to the organizational structure reporting to the VPs of Engineering Construction Storage and Transmission and Distribution Operations.

**Crisis situation** - a situation that includes emergencies, business disruptions and security threats.

**Critical roles** - roles that perform key tasks that if done incorrectly could create a significant risk or consequence.

**Design and Development** - set of processes that transforms requirements into specified characteristics or into the specification of a product, process or system.

**Document** - any information (e.g. practices, processes, procedures or reports) and its supporting medium (e.g. paper, magnetic, electronic, optical computer disc, photograph or combination thereof).

**Effective** - capable of achieving desired results.

**Element** - core components of the hybrid OMS.

**Emergency** - incidents that threaten human life, property and/or the environment if not controlled, contained or eliminated properly. Usually localized in scope and fast-moving, most emergency situations are addressed by facility plans and supplemented with business unit support, as needed.

**Emergency change** - modifications that must be implemented immediately to correct existing hazardous conditions which represent an immediate danger to life, property or the environment.

**Emergency Preparedness Plans** - a comprehensive approach to respond to various crisis situations and includes Emergency Response Plans, Business Continuity Plans and Security Threat Response Plans.

**Emergency response** - refers to the response to emergency, business continuity and security threats. It is the aggregate of decisions and measures taken to: contain or mitigate the effects of a disastrous event to prevent any further loss of life and/or property; restore order in its immediate aftermath; and re-establish normality through reconstruction and rehabilitation shortly thereafter. The first and immediate response is called emergency response.

**Emergency Response Plans** - means having practices, processes and procedures in place to responding to an emergency event affecting plant, fleet or facilities.

**Environment** - surroundings in which Corporate operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation.

**External stakeholders** - person or group outside the organization having an interest in the performance or success of our organization. Some external stakeholders include: Regulators, TSSA, contractors, Municipalities.

**Facilities** - refers to buildings intended for human occupancy. This includes, as an example, administration buildings and warehouses, but not compressor or station buildings.

**Fleet** - refers to vehicles and mobile equipment (i.e. cars, vans, back hoes, trenchers, air compressors etc.).

**Hazard** - a condition with the potential for causing an undesired consequence.

**Incident** - an event, series of events, or set of circumstances that impacts operations and requires a prompt, coordinated response beyond normal business procedures.

**Internal stakeholders** - employees or groups within the organization having an interest in the performance or success of our organization.

**Likelihood** - the qualitative description of probability and/or frequency in relation to the change that something will occur.

- Frequency - the number of times something (e.g. an activity, the hazard or incident) may occur within a specified timeframe such as daily, weekly or annually.
- Probability - a mathematical expression of the change of a particular outcome. By definition probability must be expressed as a number between 0 and 1 or converted to a percentage.

**Long Range Strategic Plans** - Spectra and Union Gas' process of determining the long term (2- 5 year) goals, identifying the best approach to achieving those goals, and making decisions on allocating its resources to pursue this strategy.

**Management Representative** - refers to the role accountable for ensuring that the OMS is established, implemented and maintained in accordance with the referenced standards and that the reports on the performance of the OMS are presented to top management for review and used as a basis for improvement of the OMS.

**Management Review** - an evaluation of the overall performance of OMS to identify improvement opportunities. These reviews are carried out by the organization's top management and are done on a regular basis.

**Management System** - a set of interrelated elements used to establish and achieve policy and objectives.

**Non-conformance** - non-fulfillment of a requirement.

**Objective** - goal, in terms of performance, that an organization sets itself to achieve.

**OMS Leadership Team** - personnel or group of top management inside the organization, having an interest in the performance or success of the organization.

**OMS Policy** - the overall intentions and direction of the organization related to its Operational performance as formally expressed by top management.

**Organizational structure** - the set of formal and informal responsibilities, authorities and relationships, arranged in a pattern, through which an organization performs its functions.

**Performance** - measurable results of an organization's management of its risks.

**Personnel** - employees and contractors within Corporate.

**Plant** - all pipeline systems and stations.

**Policy** - overall intention and direction of an organization related to its performance as formally expressed by top management. The policy provides a framework for action and for the setting of objectives.

**Preventive action** - an action taken to eliminate the causes of a potential nonconformity, defect or other undesirable situation to prevent occurrence.

**Project** - unique process, consisting of a set of coordinated and controlled activities with start and finish dated, undertaken to achieve an objective conforming to specific requirements, including the constraints of time cost and resources.

**Record** - document stating results achieved or providing evidence of activities performed.

**Record Security Levels** - "Controlled", "Protected-Proprietary", "Secret", "Privileged and Confidential", "Protected-Commercial"

**Resources** - include people, money, information, knowledge, skill, energy, facilities, machines, tools, equipment, technologies and techniques.

**Replacement in kind** - replacement of an item with a similar item that has the same specifications as the item being replaced.

**Review** - activity undertaken to determine the suitability, adequacy and effectiveness of the subject matter to achieve established objectives.

**Risk** - a compound measure, either qualitative or quantitative, of the likelihood and consequence of an adverse effect.

**Risk Assessment** - a systematic evaluation of the degree of risk posed by an activity or operation.

**Risk Registry** - a collection of risk assessments (including probability, consequence) and their associated controls.

**Root cause analysis** - problem solving methodology aimed at identifying the root causes of problems or events and conducted in order to correct or prevent the occurrence/reoccurrence of the problem or event.

**Security** - prevention of and protection to personnel and plant against assault, damage, fire, fraud, invasion of privacy, theft, unlawful entry and other such occurrences caused by deliberate action.

**Security Threat Response Plans** - means having practices, processes and procedures to respond to security threats to people, plant, facility, fleet.

**Suitable** - suited to or for, well fitted for the purpose, appropriate for the occasion.

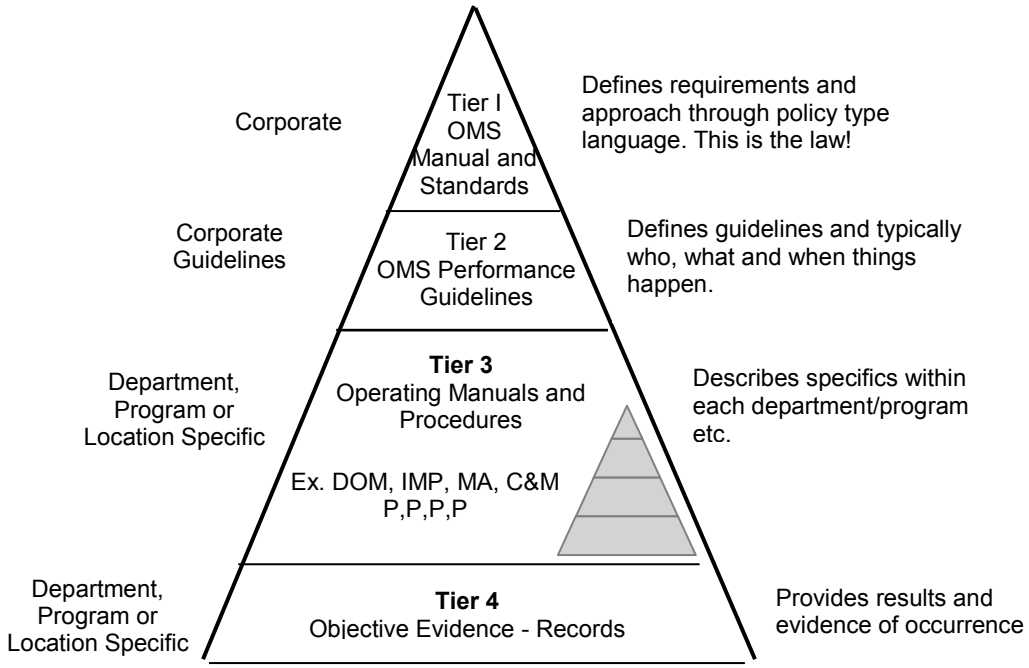
**Target** - detailed performance requirement, applicable to the organization or parts thereof, that arises from the objectives and that needs to be set and met in order to achieve those objectives.

**Tier 1** - documentation consisting of OMS Policy and OMS Manual.

**Tier 2** - documentation addressing OMS requirements as defined in CSA Z662, ISO9001, ISO14001 and OHSAS 18001. These documents are primarily of concern to those with direct responsibilities and accountabilities for implementing, managing and reporting on the overall OMS and significant risks.

**Tier 3** - documentation providing more detailed procedures, programs and practices for conforming to the requirements identified in Tier II documents.

**Tier 4** - documentation consisting of records related to the OMS.




**Temporary change** - approved modifications that have specific ending dates and are not intended to be permanent.

**Top management** - person or group of people who directs and controls the organization at the highest level.

**Training Needs Assessment** - refers to the process of identifying the who/what and awareness, knowledge and skill.

- Awareness - refers to the ability to identify the relevance and importance of activities.
- Ability - experience, comprehension and judgment to use knowledge and skills in practice.

**Validation** - confirmation through the provision of objective evidence that requirements for a specific intended use or application have been fulfilled.

**Verification** - confirmation through the provision of objective evidence that specified requirements have been fulfilled.

# OMS Revision Summary

This list describes at a high level the nature of the changes that have been made to the Operations Management System.

| Revision Date | General Revisions |
|---|---|
| 2009-05 | Document footers updated to show Mike Shannon as OMS owner |
| 2012-04 | Document footers updated to show Ruth Dekker as OMS issuer and Paul Rietdyk as OMS owner.<br>Page 13: OMS risk matrix replaced with current matrix. |
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UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit B1, Tab 7, page 2

Please provide the full business case for the Enterprise Asset Management project, together with any presentations to the Executive team or the Board of Directors seeking approval or revised approval for that project.

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**Response:**

Please see the response at J.B-4-1-13 for the business case and presentations. The EAM project is not yet an approved project.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: B1, T3, Page 2

Please provide a copy of the Distribution Business Guidelines filed in EB-2005-0520, and a blacklined version of the "new guidelines" filed in Appendix A to the current filing for ease of comparison. Please explain any proposed changes fully.

---

**Response:**

Please see the response at Exhibit J.B-1-3-2 a) for a blackline version of the Distribution New Business Guidelines showing the changes since it was filed in EB-2005-0520.

The substantive changes to the guidelines include:

- Market charges have been eliminated as a means of financing Aid to Construction. The rationale for this change is that larger projects where this mechanism has been used in the past have not resulted in full recovery of the market charge.
- The maximum length of a residential service lateral installed at Union's cost has increased from 20 metres to 30 metres. This change will improve the administrative process for service laterals and simplify the requirements for the majority of new residential customers.
- The charge to residential customers for service lateral lengths in excess of 30 metres has increased from $30 to $45 per metre. The $45 per metre charge is based on average costs for residential services, recognizing that with increased thresholds before the charge applies, a much higher proportion of excess length situations are likely to occur in built up areas as opposed to new subdivisions.
- The minimum load requirement has been changed from 1,000 cubic meters per year to a minimum requirement of attaching a water heater or primary heart source. This change recognizes that monthly fixed charges account for a higher portion of a residential gas bill than at the time this portion of the policy came into effect.

Union believes that these changes will simplify the attachment process for new customers, and will not have a significant detrimental impact on the profitability of the new business portfolio or the rolling project portfolio.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: Table 1, Page 5

Please provide those additional 2012 and 2013 estimated housing starts now available for the eight sources that had not reported at time Union created the forecast. Please explain any 2012 and 2013 estimates that are still not available and state when they will be available.

---

**Response:**

Please see the response at Exhibit J.O-2-2-5 a) for an updated consensus forecast.

Each of the organizations listed at Exhibit B1, Tab 3, p.5 have differing timelines and forward projection periods when publishing their housing start forecasts. Union obtains this information from publicly available sources and does not control when, or if, each of the organizations publish their forecasts. Consequently Union cannot explain the absence of, or expected availability timeframes for, published forecast information from any of the organizations.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: B1, T3, Page 7

Please break down the forecast 2013 starts (17.702) into single family homes, condominiums, and rental units. Are the same methods used to project future gas volumes for these three categories of dwelling, or are there differences? Please provide details.

---

**Response:**

Union does not break down Ontario housing starts in its franchise area into the categories requested. Union prepares the forecast on a macro basis, starting from the broader Ontario forecast number of housing starts, and applying projected ratios based on Union's historic geographic total share of total provincial starts at existing penetration rates to arrive at housing starts for Union's franchise.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref:

Please provide recent trends, say the last five years, for average square footage for single family homes, condominiums, and rental units, constructed in Union's franchise area. Please estimate the impact the changes would have on throughputs, all else being equal.

---

**Response:**

Union residential surveys indicate that over the period 2007 to 2011 new single family dwellings averaged about 1,940 square feet in size with a range of 1,898 to 1,965 square feet.

The market share of multi-family housing is increasing over time as households adjust to the price of single family housing in the outer regions surrounding the GTA. Multi-family housing on average is smaller than single family housing. Union multi-family surveys indicate a dwelling size averaging about 1,480 square feet. Consequently, the increasing multi-family market share trend gradually lowers the average dwelling size of all homes.

The impact of changes in the house size on the estimated total residential throughput volumes is minimal. New residential customer growth is about 1.5% per year. A 5% change in the average new single family house size would affect annual throughput by slightly less than 0.1%. A 5% change is about 100 square feet which is larger than the surveyed range described earlier.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: Page 7, Line 20

Please provide a longer term record, at least ten years for the 11.6 ratio. How are new medium and large office buildings, large warehouses and shopping centres, and institutional buildings, eg. hospitals, attachments accounted for? What are the thresholds for providing separate building specific estimates?

---

**Response:**

The table below shows the historic ratio between total residential (single & multi-family) and non residential customer attachments.

| Year | Ratio | Year | Ratio |
|---|---|---|---|
| 2002 | 13.4 | 2007 | 7.9 |
| 2003 | 11.6 | 2008 | 11.5 |
| 2004 | 11.1 | 2009 | 10.7 |
| 2005 | 10.0 | 2010 | 12.3 |
| 2006 | 8.8 | 2011 | 11.5 |

The ratios tabled above are used to estimate non-residential general service rate customer attachments. A three year moving average of the annual ratios indicates a gradual rising trend in the ratio over time: 2006 10.0 and 2011 11.5.

The trend in the ratio implies that the number of new commercial attachments associated with new residential customers gets smaller over time.

Union prepares the general service attachment forecast on a macro basis, using the ratio referenced above. Any new medium and large office buildings, large warehouses, shopping centres and institutional buildings are included in the forecast on that basis. As a result, these larger new general service customers are not forecasted at a specific individual building level.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: B1, T1, Page 3

What is the correct number for "Transfers" for 2012?

---

**Response:**

The correct number for transfers in 2012 is $0. The $10.5 million transfer included in 2012 at Exhibit B1, Tab 1, Table 2 should be included in 2013 based on the Board's EB-2012-0048 Decision and Order dated March 28, 2012. The Decision ordered Union to return the St. Clair Line to rate base effective January 1, 2013.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: B1, Pages 1 and 7

Please explain fully what is meant by the draw downs of "accumulated deferral taxes" which is shown as a reduction in the Rate Base Summary, Table 1.

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**Response:**

Please refer to Exhibit D1, Tab 4, Page 2, lines 13-21.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref:

Please provide the impact on rates in each year over the period of the useful life of an asset in question (20 years) of capitalizing $1.00 of O&M each year. If you wish, show the result for assets depreciated over different periods.

---

**Response:**

Attachment 1 outlines the revenue requirement impacts of capitalizing $1 of O&M in the year the assets goes into service using 3 different useful lives. For simplicity, Union has assumed that depreciation expense equals capital cost allowance for tax purposes.

In year one the rates will decrease due to the capitalization of O&M, but will be higher in later years. Amounts cannot be arbitrarily transferred from O&M to capital and must meet the criteria outlined in Union's capitalization policy submitted at Exhibit B1, Tab 2, Appendix A to be in compliance with accounting rules.

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | Year 14 | Year 15 | Year 16 | Year 17 | Year 18 | Year 19 | Year 20 | Year 21 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Example 1 - 20 Year Life** | | | | | | | | | | | | | | | | | | | | | | |
| O&M | - 1.00 | | | | | | | | | | | | | | | | | | | | | |
| Depreciation Expense | 0.03 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.02 | |
| Net impact | - 0.97 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.02 | |
| Gross Plant | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Accumulated Depreciation | - 0.03 | - 0.08 | - 0.13 | - 0.18 | - 0.23 | - 0.28 | - 0.33 | - 0.38 | - 0.43 | - 0.48 | - 0.53 | - 0.58 | - 0.63 | - 0.68 | - 0.73 | - 0.78 | - 0.83 | - 0.88 | - 0.93 | - 0.98 | - 1.00 | |
| Net Plant | 0.97 | 0.92 | 0.87 | 0.82 | 0.77 | 0.72 | 0.67 | 0.62 | 0.57 | 0.52 | 0.47 | 0.42 | 0.37 | 0.32 | 0.27 | 0.22 | 0.17 | 0.12 | 0.07 | 0.02 | - | |
| Revenue Requirement Calculation | | | | | | | | | | | | | | | | | | | | | | Total |
| Return on Rate Base | 0.08 | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.00 | - | 0.77 |
| Income Taxes | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | - | 0.13 |
| Depreciation Expense | 0.03 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.02 | 1.00 |
| Total | 0.12 | 0.13 | 0.13 | 0.12 | 0.12 | 0.12 | 0.11 | 0.11 | 0.10 | 0.10 | 0.09 | 0.09 | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | 0.05 | 0.02 | 1.90 |
| O&M | - 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - 1.00 |
| Total Revenue Requirement Impact | - 0.88 | 0.13 | 0.13 | 0.12 | 0.12 | 0.12 | 0.11 | 0.11 | 0.10 | 0.10 | 0.09 | 0.09 | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | 0.05 | 0.02 | 0.90 |

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Example 2 - 10 Year Life** | | | | | | | | | | | | |
| O&M | - 1.00 | | | | | | | | | | | |
| Depreciation Expense | 0.05 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.05 | |
| Net impact | - 0.95 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.05 | |
| Gross Plant | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Accumulated Depreciation | - 0.05 | - 0.15 | - 0.25 | - 0.35 | - 0.45 | - 0.55 | - 0.65 | - 0.75 | - 0.85 | - 0.95 | - 1.00 | |
| Net Plant | 0.95 | 0.85 | 0.75 | 0.65 | 0.55 | 0.45 | 0.35 | 0.25 | 0.15 | 0.05 | - | |
| Revenue Requirement Calculation | | | | | | | | | | | | Total |
| Return on Rate Base | 0.07 | 0.07 | 0.06 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 | 0.01 | 0.00 | - | 0.39 |
| Income Taxes | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | - | 0.07 |
| Depreciation Expense | 0.05 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.05 | 1.00 |
| Total | 0.14 | 0.18 | 0.17 | 0.16 | 0.15 | 0.14 | 0.13 | 0.12 | 0.11 | 0.10 | 0.05 | 1.46 |
| | | | | | | | | | | | | - |
| O&M | - 1.00 | - | - | - | - | - | - | - | - | - | - | - 1.00 |
| Total Revenue Requirement | - 0.86 | 0.18 | 0.17 | 0.16 | 0.15 | 0.14 | 0.13 | 0.12 | 0.11 | 0.10 | 0.05 | 0.46 |

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | |
|---|---|---|---|---|---|---|
| **Example 3 - 4 Year Life** | | | | | | |
| O&M | - 1.00 | | | | | |
| Depreciation Expense | 0.13 | 0.25 | 0.25 | 0.25 | 0.12 | |
| Net impact | - 0.87 | 0.25 | 0.25 | 0.25 | 0.12 | |
| Gross Plant | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Accumulated Depreciation | - 0.13 | - 0.38 | - 0.63 | - 0.88 | - 1.00 | |
| Net Plant | 0.87 | 0.62 | 0.37 | 0.12 | - | |
| Revenue Requirement Calculation | | | | | | Total |
| Return on Rate Base | 0.07 | 0.05 | 0.03 | 0.01 | - | 0.15 |
| Income Taxes | 0.01 | 0.01 | 0.00 | 0.00 | - | 0.03 |
| Depreciation Expense | 0.13 | 0.25 | 0.25 | 0.25 | 0.12 | 1.00 |
| Total | 0.21 | 0.31 | 0.28 | 0.26 | 0.12 | 1.18 |
| O&M | - 1.00 | - | - | - | - | - 1.00 |
| Total Revenue Requirement | - 0.79 | 0.31 | 0.28 | 0.26 | 0.12 | 0.18 |

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref:

Please compare Union's amount of total O&M (including overhead expenses shown separately) capitalized under the current policy with that of Enbridge, and other Canadian gas utilities.

---

**Response:**

Union does not have the information available to complete the comparison.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref:

What would the amount capitalized in 2013 be if Union were to operate under IFRS rather than US GAAP? Please discuss and provide necessary references to IFRS documentation.

---

**Response:**

| Line No. | Particulars ($000's) | |
|---|---|---|
| 1 | 2013 Net Additions – US GAAP | 312,531 |
| 2 | Indirect Overheads | (48,660) |
| 3 | 2013 Net Additions – IFRS | 263,871 |

Indirect overheads would be expensed in the current period under IFRS.

Please see the response at Exhibit J.O-7-1-2 a). Indirect overheads are specific examples of costs that cannot be capitalized under IFRS (see IAS 16, paragraph 19 (d)).

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: D1, T2, Page 3, Table 2

Capitalization of O&M is showed to decrease by 14.1 million in 2013 from Board approval in 2007. Please explain the difference. Is it due in whole or in part to a difference in capitalization policy?

---

**Response:**

Capitalization of O&M is showed to increase by $14.1 million in 2013 from the Board-approved in 2007. Capitalization was 15% of gross O&M in 2007 and 16% of gross O&M in 2013. This change is a result of an increase in gross O&M and is not due to a change in capitalization policy.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: B1, T2, Pages 7-10

Please provide the amount of capital spent on new or renovated service centres in each year from 2007 to 2012 inclusive, and what is proposed to be spent in 2013? Please describe the projects in detail. Please list the centres. Please provide a copy of the CB Richard Ellis study.

---

**Response:**

**Hamilton District Office and Training Centre** – new building to replace the current Hamilton facility and the Training and Education Centre.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2010 | $2.8 million (Land Purchase) |
| 2 | 2011 | $2.5 million (Engineering) |
| 3 | 2012 | $11.7 million (Engineering & Construction) |
| 4 | 2013 | $13.6 million (Construction & Move-in) |

**Waterloo District Office Renovation** – the current building was constructed 26 years ago with several small renovations and upgrades. More extensive interior and exterior work was completed to bring the existing office building and interior environment up to LEED standards.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2010 | $1.7 million (Roof and HVAC replacement – completed prior to scoping the current renovation project) |
| 2 | 2011 | $4.8 million (Engineering & Construction) |
| 3 | 2012 | $2.3 million (Construction & Move-in) |

**Chatham Corporate Office Renovation** – Ground floor tower renovation to add meeting and training rooms.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2011 | $2.7 million * (Engineering) |
| 2 | 2012 | $1.5 million (Construction) |
| 3 | 2013 | (Construction & Move-in) |

*In the original forecast, Union planned to spend $2.7 Million in 2011 to complete a significant portion of this project. Delays in securing a temporary location for affected employees pushed the project timelines back by several months, resulting in an actual spend of $0.183 million in 2011. Capital costs to complete this project will be deferred into 2012 and 2013. The project budget is still $4.2 Million.

**London District Office –** The London District Office is 43 years old and requires updating to bring it up to today's office standards. London warehouse renovated to become a central warehouse, renovation included additional racking, loading dock upgrades, updated lighting, office space, USR shop and tool room relocation. A new generator which provides full facility back up power was installed. New ergonomic workstations, business centre, conference rooms, offices, carpets, and finishes throughout parts of the building.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2011 | $3.6 million (actual) (Engineering & Construction) |

**Kingston District Office** – new building to replace the dated Kingston facility.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2008 | $3.6 million (actual) (Engineering & Construction) |
| 2 | 2009 | $8.5 million (actual) (Construction & Move-in) |

**Kingston Microturbine TriGen –** the Kingston facility heating and cooling was built to operate as tri-gen to enhance facility performance.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2010 | $0.8 million (actual) (Engineering & Construction) |

**Windsor District Office** – new building to replace the dated Windsor facility.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2007 | ($6) million -Salvage |
| 2 | 2008 | $7.5 million (actual) (Engineering & Construction) |
| 3 | 2009 | $ 6 million (actual)(Construction & Move-in) |

**London Dispatch Office** – Expanded modernized and redesigned the 24/7 planning and dispatch facility.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2007 | $1 million (actual) (Engineering, Construction & Move-in) |

**Burlington District Office** – new building to replace the dated Burlington facility.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2007 | $8 million (actual) (Engineering & Construction) |
| 2 | 2008 | $3.1 million (actual) (Construction & Move-in) |

**Chatham Head Office** – Cafeteria Updates

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2007 | $0.1 million (actual) (Engineering & Construction) |
| 2 | 2008 | $0.5 million (actual) (Construction) |

**Chatham – King Street Location** – Leasehold improvements to include 190+ workstations, meeting rooms, enclaves, business centers, washrooms, storage rooms, lunch room, offices and mail room which will free up space at Head Office.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2011 | $2.1 million (actual) (Engineering,Construction & Move-in) |

**North Bay Meter Shop Renovation** – the North Bay Meter Shop facility was expanded to address over safety and operational challenges caused by a lack of space and crowding.

| Line No. | Years | Cost |
|---|---|---|
| 1 | 2010 | $2 million (actual) (Engineering & Construction) |

Please see the response at Exhibit J.B-1-5-13 for a copy of the CB Richard Ellis Study.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: T2, Page 11

Please describe in detail the Marcellus-Kirkwall Station modifications and the Parkway Measurement Upgrade.

---

**Response:**

The Kirkwall Station modifications will consist of the installation of four 42" valves complete with operators and piping, four control valves and valve operators on each of the 13 existing meter runs. The modifications will allow bi-directional flow through the existing meter runs and to provide control for gas flow in and out of Union's system.

The Parkway measurement upgrade consists of the replacement of existing 42"and 20" check measurement ultrasonic meters with 5 runs of bi-directional 16" ultrasonic meters (Measurement Canada certified) including remotely operated isolation valves for each meter.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: T2, Page 7

Please complete Table 1 by providing the actuals for 2008 and 2009.

---

**Response:**

Please see the response at Exhibit J.B-1-2-2, Attachment 1.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: T2, Table 4, Page 6

Has OPG's proposed Lambton coal to gas conversion plant received approval yet from: 1) the OPG Board; 2) the provincial government? What is the proposed size of the plant?

---

**Response:**

1) Union is not privy to OPG Board decisions.

2) A Ministerial Directive to proceed with the conversion of Lambton GS has not been issued. The size of the proposed conversion is 950 MW.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: T2, Page 6

Has the OPG's proposed Guelph cogeneration power plant received approval yet from: 1) the OPG Board; 2) the provincial government? What is the proposed size of the plant?

---

**Response:**

Please see the response at Exhibit J.B-1-2-3 f).

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: T2, Page 9

How do Union's Vehicle Replacement Guidelines compare with Spectra's? Please provide a copy of the PHH Strategic Consulting Study.

---

**Response:**

Please see the response at Exhibit J.B-1-2-3 g) and Exhibit J.B-4-1-3 b).

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: B1, T5, Page 3

What is meant by non-facility capacity in lines 4 and 11? Please explain fully and describe the non-facility capacity that was put in place for the winters of 2010/2011 and 2011/2012.

---

**Response:**

Please see the response at Exhibit J.B-1-7-7.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: B1, T6, Page 4

Please provide a copy of CSAZ66207 Standard for Oil and Gas Pipeline Systems, adopted by the Technical Standards and Safety Authority.

---

**Response:**

CSA distributes copies of their standards under license. Please refer to the CSA website for purchasing instructions.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: T6, Page 8, Table 8

Why did Union's IMP related actual expenditures on IMP plan for Pipelines, at or about 30% SMUS, exceed budgeted amounts by over 100% in 2010 and over 200% in 2011? Please provide details. What have the actuals been, both capital and operating vs. proposed (see Table 3, page 11) for 2012?

---

**Response:**

Union had initially forecast a decrease in the capital spending for 2010 and 2011 based on costs to make pipelines piggable and the level of remediation that was required in the earlier years of the program. Since then the cost to make the pipelines piggable and the level of pipeline and defect replacements to address and reduce the safety risk from what was found from the assessments, have both increased, resulting in an increase of capital spending.

The vast majority of the integrity related work planned for 2012 is scheduled after April 30, 2012. Although some actual spending is available for 2012, it is very limited and would not offer any type of meaningful comparison to proposed levels.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: B1, T9, Page 1

Please explain, with a diagram, if necessary, the difference between the "suction side" and the "discharge side" of the Parkway Station. Please describe, in detail, with diagrams, what infrastructure does TCPL have, contiguous with, or very near, the Union Parkway Station?

---

**Response:**

A natural gas compressor is a machine used to increase gas pressure within a pipeline system. The gas travelling through the compressor is essentially "sucked" into the compressor on the low pressure (suction) side and compressed. The higher pressure gas is then pushed out the discharge side.

Union does not know in detail the infrastructure TCPL has adjacent to the Union Parkway system. Union does know that TCPL has a measurement station and pipeline systems to move gas away from Parkway towards Maple and Niagara.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: Page 2

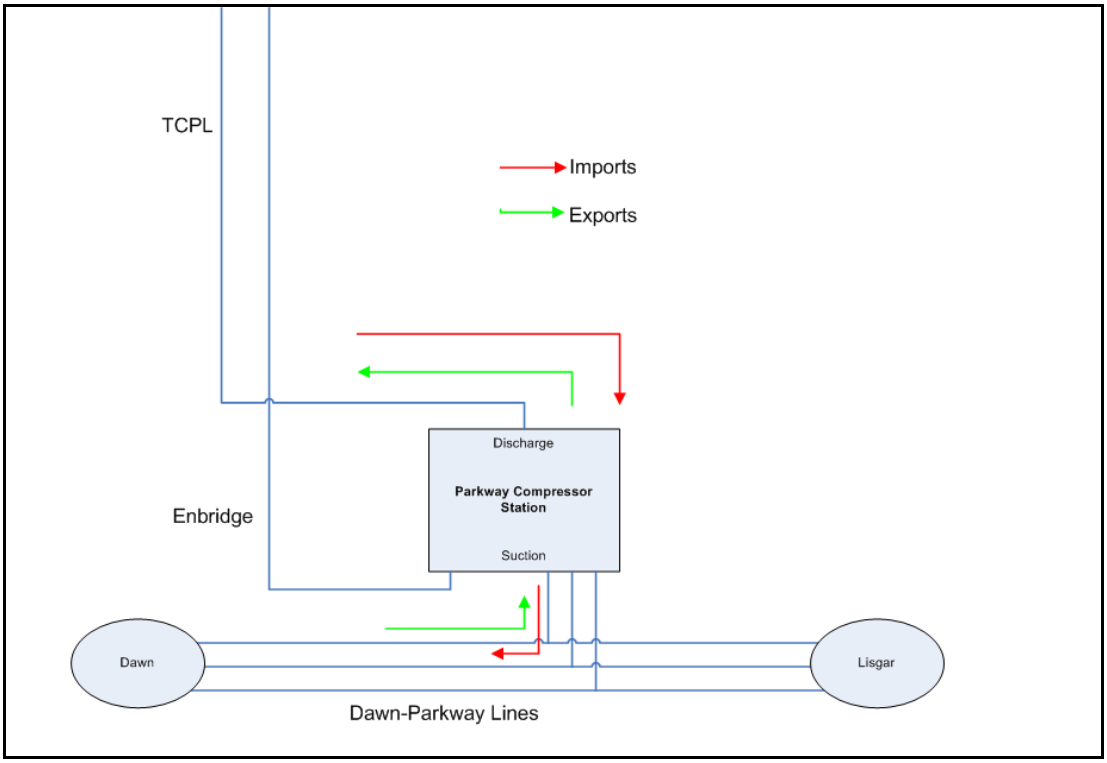
Please explain what is meant by "exports and imports" to and from Parkway Compression, using diagrams. Please break down the forecast increase of "exports" from 2.0 PJ/d to 3.0 PJ/d from 2011 to 2015/16 among the four causes contained in paragraphs (i) through (iv) on page 2.

---

**Response:**

"Exports" from the Parkway Compressor Station represent gas delivered into the TCPL system at the Parkway station. "Imports" represent gas received by Union at the Parkway station from TCPL. A diagram showing gas flow at Parkway is provided below.

Enbridge volumes are not compressed at Parkway and are delivered from the lower pressure "suction" side of the station.



UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: Page 2-3

Please explain how LCU protection is achieved for Dawn, Lobo and Bright compression, and how it is proposed to be achieved at Parkway discharge. Please provide the description of the technical solutions and the costs that were used, or will be used, in the case of Parkway discharge, in each case. Please show in detail how the LCU at Parkway discharge will prevent the loss of: 1) delivery capability to TCPL; 2) consequences of that failure.

---

**Response:**

Please see the response at Exhibit J.B-1-7-6 for detail on existing LCU protection.

Please see the response at Exhibit J.B-1-1-2 for detail on the LCU proposed as part of the Parkway West Project.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: Page 4

Please describe, with diagrams, how the proposed "second metering and header" station fits into Union's existing compressor infrastructure at Parkway, including the existing connections with Enbridge at Parkway (Consumers) and Lisgar. Please explain the significance of the valve site. Please describe where the Lisgar station is, in relation to Parkway station. Is Lisgar a direct connection between Union and Enbridge? Please discuss fully.

---

**Response:**

Please see the response at Exhibit J.B-1-1-2 a) and Exhibit J.B-1-7-13 c).

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: Page 5

Has Union optioned the land in question for the Parkway West?

---

**Response:**

Union has secured an option to purchase for a parcel of land for the Parkway West Project. Please see the response at Exhibit J.B-1-1-2 a) for additional information.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: Page 6

Does the Parkway West Project deal with the "TCPL congestion at Maple"? Please explain Union's understanding of the congestion issue, why it exists, and its history. How does the Parkway West Project, if at all, deal with the "congestion" problem? Please explain fully, using diagrams, if appropriate.

---

**Response:**

The Parkway West Project does not increase Union's capacity through Parkway. With existing compression fully utilized, Parkway can discharge volumes into TCPL in excess of current operating agreement limits. If no congestion existed between Parkway and Maple, TCPL would have no requirement to move volumes out of Dawn and "around the horn" to Parkway and markets east of Parkway. The "congestion problem" has been addressed previously by Union. Please see response at Exhibit J.B-1-7-8 e), page 18 of Attachment 3 and page 5 of Attachment 4, and response at Exhibit J.O-5-3-1, Attachment 1.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B1, Tab 8

a) Does Union have any customer classes that are billed on an other than monthly basis? If yes, please describe the billing frequency.

b) For each rate class shown in Schedule 3, please provide the service lag, billing lag and collection lag.

c) How is the collection lag calculated based on the payment date that was obtained from each customer payment transaction? In particular, is the collect lag weighted equally for each customer payment transaction of is it weighted by the dollar amount associated with each customer payment transaction?

d) Is there any impact on the lead/lag study associated with payment of long-term debt or short- term debt? If not, why not?

e) What is the difference between the Rate M2 (contract) and Rate 01/M2 (Banner) lines shown in Schedule 3? Has this split changed in 2011? Is the split expected to be different in 2013 than that shown for 2010? If yes, please provide details.

f) Have there been any changes between 2010 and 2013 that would have a significant impact on the calculation of either the revenue lag or the expense leads? If yes, please provide details.

---

**Response:**

a) No.

b) Please see Attachment 1.

c) Service, billing and collection lags are combined into revenue lag. Revenue lags are dollar weighted according to the amount of billed revenue.

d) No, there is no impact. Debt is not a component of rate base but rather it is a method of funding rate base similar to equity. Interest payments are paid from the operations of the business and are not a required component of cash working capital.

e) Rate M2 (Contract) represents the M2 customers that are billed from the contract system. Rate 01/M2 (Banner) represents all customers billed from the Banner system. The "M2" associated with Banner also represents M1 customers. The split shown in Schedule 3 is representative of 2011 and the expected split in 2013.

f) The Board recently extended the billing period by four days. Assuming all other factors remained unchanged this would increase the collection lag by a similar amount and increase the Cash Working Capital component of Rate Base by approximately $13.1 million. Since it is unknown to what extent payment behaviour will actually change this impact was not included in the lead/lag study.

UNION GAS LIMITED
Gas Sales Collection Revenue Lag
Study Year - Calendar 2010

| Line No | Particulars ($000's) | Total Remittance | Revenue Lag (Days) | Dollar Days | Lag Days | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Service | Billing | Collection | Total |
| | | (a) | (b) | (c) = (a) x (b) | (d) | (e) | (f) | (g) |
| | General Service | | | | | | | |
| 1 | Rate M2 (Contract) | 5,762 | 33.3 | 191,776 | 14.7 | 2.6 | 16.0 | 33.3 |
| 2 | Rate 01/M2 (Banner) | 1,327,992 | 39.4 | 52,371,507 | 15.2 | 3.2 | 21.0 | 39.4 |
| 3 | Rate M1 | 11 | 32.3 | 363 | 14.5 | 1.9 | 16.0 | 32.3 |
| 4 | Rate 10 | 8,709 | 32.6 | 284,348 | 14.7 | 2.0 | 16.0 | 32.6 |
| 5 | Rate 01 | 73 | 35.0 | 2,538 | 15.0 | 4.0 | 16.0 | 35.0 |
| 6 | Rate T-2 | 3,869 | 33.2 | 128,541 | 14.7 | 2.5 | 16.0 | 33.2 |
| 7 | Total General Service | 1,346,417 | 39.3 | 52,979,074 | | | | |
| | Wholesale Utility | | | | | | | |
| 8 | Rate T-9 | 929 | 33.1 | 30,755 | 14.7 | 2.4 | 16.0 | 33.1 |
| 9 | Rate M10 | 87 | 33.0 | 2,882 | 14.7 | 2.2 | 16.0 | 33.0 |
| 10 | Rate T-10 | 80 | 33.0 | 2,647 | 14.7 | 2.3 | 16.0 | 33.0 |
| 11 | Total Wholesale | 1,097 | 33.1 | 36,284 | | | | |
| | Contract | | | | | | | |
| 12 | Rate M4 | 3,226 | 33.4 | 107,587 | 14.7 | 2.6 | 16.0 | 33.4 |
| 13 | Rate T-7 | 6,295 | 32.9 | 207,010 | 14.7 | 2.2 | 16.0 | 32.9 |
| 14 | Rate 20 | 29,451 | 33.7 | 993,390 | 14.7 | 3.0 | 16.0 | 33.7 |
| 15 | Rate 30 | 1,164 | 33.8 | 39,328 | 14.9 | 2.9 | 16.0 | 33.8 |
| 16 | Rate 100 | 27,189 | 34.1 | 926,286 | 14.8 | 3.3 | 16.0 | 34.1 |
| 17 | Rate T-1 | 63,320 | 33.7 | 2,134,867 | 14.7 | 3.0 | 16.0 | 33.7 |
| 18 | Rate T-3 | 4,346 | 33.9 | 147,267 | 14.7 | 3.2 | 16.0 | 33.9 |
| 19 | Rate T-4 | 12,673 | 33.2 | 420,310 | 14.7 | 2.5 | 16.0 | 33.2 |
| 20 | Rate T-5 | 10,527 | 33.1 | 347,918 | 14.7 | 2.3 | 16.0 | 33.1 |
| 21 | Rate M5 | 2,503 | 33.0 | 82,538 | 14.8 | 2.2 | 16.0 | 33.0 |
| 22 | Total Contract | 160,692 | 33.6 | 5,406,502 | | | | |
| 23 | Total | 1,508,206 | 38.7 | 58,421,859 | | | | |

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B1, Tab 8, Schedule 3

a) Please explain why there are no lines for Rates M7 and M9.

b) Please explain what is included under rates T-9 and T-10.

c) Please explain how the figures in the total remittance column have been calculated as compared to the revenues figures shown by rate class in Exhibit C6, Tab 2, Schedule 1. For example, why is the Rate M1 remittance shown as $11 (thousand) in Schedule 3 as compared to $836 (thousand) in Schedule 1 of Exhibit C6, Tab 2?

---

**Response:**

a) Rates M7 and M9 are represented by Rate T-7 and T-9 respectively. The "T" designation represents bundled T-Service and is used within Union's billing system to track this activity.

b) T-9 is equivalent to M9 and T-10 is equivalent to M10.

c) Exhibit B1, Tab 8, Schedule 3 represents the amount billed by Union's billing systems during 2010 while Exhibit C6, Tab 2, Schedule 1 represents all activity booked on an accrual basis during 2010.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B3, Tab 3, Schedule 2 & Exhibit B1, Tab 8, Schedules 6 & 7

a) Please provide a breakdown of the total utility operating and maintenance expenses other than gas purchases costs of $372,559 shown in Exhibit B3, Tab 3, Schedule 2 into the components shown in Exhibit B1, Tab 8, Schedule 7.

b) Please provide a breakdown of the adjusted cost of gas of $707,192 shown in Exhibit B3, Tab 3, Schedule 2 into the components shown in Exhibit B1, Tab 8, Schedule 6.

---

**Response:**

a)

| | ($000's) |
|---|---|
| Salaries & Wages | 149,991 |
| Employee Benefits | 45,245 |
| Other O&M | 177,323 |
| Total | 372,559 |

b)

| | ($000's) |
|---|---|
| TCPL Transport | 165,886 |
| Other Transport | 69,776 |
| Commodity | 653,860 |
| Local Producers | 5,153 |
| Storage | 425 |
| Deferrals/Timing | (187,907) |
| Total | 707,192 |

The lead/lag study is based on actual payments not an accrual approach. The amount of $707,192 million shown in Exhibit B3, Tab 3, Schedule 2 is based on an accrual approach. The amount increased to reflect the amounts that are going through the deferral accounts or for timing near year-ends.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit C3, Tab 1, Schedule 1

a) Please provide a table that shows the monthly composition of the total operating revenue of $1,598,544 shown in the schedule broken down into the four components shown on the schedules in lines 1 through 4, along with the total shown in line 5.

b) Please explain how any significant difference in the monthly revenues has been accounted for in through the lead/lag study.

---

**Response:**

a) Please see Attachment 1.

b) The analysis for the lead/lag study was prepared on a monthly basis and weighted according to the amount of billed revenue.

UNION GAS LIMITED
Monthly Operating Revenue
2013 Test Year

| Line No. | Particulars ($000's) | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) |
| 1 | Gas sales & T-Service | 204,645 | 182,822 | 163,999 | 115,011 | 79,324 | 61,043 | 61,563 | 61,797 | 67,033 | 93,595 | 131,756 | 179,281 | 1,401,869 |
| 2 | Transportation | 15,292 | 15,007 | 14,228 | 12,903 | 12,845 | 12,856 | 12,862 | 12,862 | 12,851 | 12,810 | 13,253 | 14,286 | 162,055 |
| 3 | Storage | 801 | 801 | 801 | 810 | 810 | 810 | 1,151 | 1,151 | 1,151 | 1,067 | 1,067 | 1,068 | 11,488 |
| 4 | Other revenue [(1)] | 1,700 | 1,880 | 1,956 | 2,027 | 2,073 | 2,270 | 1,925 | 1,879 | 1,733 | 1,876 | 2,112 | 1,701 | 23,132 |
| 5 | Total operating revenue | 222,438 | 200,510 | 180,984 | 130,751 | 95,052 | 76,979 | 77,501 | 77,689 | 82,768 | 109,348 | 148,188 | 196,336 | 1,598,544 |

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Tab 8, Schedule 1 and Schedule 7

a) Please provide Copies of the equivalent Schedule 1 and Schedule 7 O&M Expense Leads and Lags approved by the Board in 2007.

b) Please provide references to the 2007 evidence and any additional explanatory notes.

c) In particular, provide details of the changes affecting the increase for 2013 including controllable expenses.

---

**Response:**

a) Please see Attachment 1.

b) 2007 evidence can be found in EB-2005-0520, Exhibit B1, Tab 8.

c) Dollar amounts provided in column (a) for both 2007 and 2013 evidence are based on actual data used in the determination of the lead lag factors. Though they may be indicative of actual O&M amounts they do not reflect accrual accounting, capitalization or unregulated impacts. For O&M variances it is recommended to refer to those portions of evidence in Exhibit D.

   i) The decrease in the Salaries & Wages expense lead is due to remitting payroll amounts to the provider prior to the date of pay whereas in the past Union remitted these amounts on the due dates.

   ii) The Employee Benefits lead increase is related to payments for employee pension plans, savings plan and future employee benefits payments. The employee savings plan remittances are now paid early in the subsequent month whereas previously they were paid late within the same month as the related pay. Payment related to pension and future employee benefits are now weighted later in the month.

   iii) The increase in the expense lead for Other O&M results from the detailed study of random invoices as identified at Exhibit B1, Tab 8, Page 5 which is believed to be a better method than the high level assessment of the Procurement Department, which underpinned the study filed in support of 2007 rates.

UNION GAS LIMITED
Summary of Lead Lag Results
Study Year - Calendar 2004

| Line No. | Particulars (Days) | Lead/Lag |
|---|---|---|
| | Operating Revenue Lag: | |
| 1 | Gas Sales Revenue | 41.5 |
| 2 | Transportation and Storage Revenue | 39.0 |
| 3 | Other Revenue | 40.5 |
| 4 | Overall Operating Revenue Lag (1) | 41.2 |
| | Cost of Service Expense Leads: | |
| 5 | Cost of Purchased Gas (2) | 39.6 |
| | O&M: | |
| 6 | Salaries and wages | 14.2 |
| 7 | Employee Benefits | 14.5 |
| 8 | Other O&M | 18.2 |
| 9 | Overall O&M Expense Lead (3) | 16.0 |
| 10 | Gas Purchase Cost Lag (Line 4-Line 5) | 1.6 |
| 11 | O&M Cost Lag (Line 4-Line 9) | 25.2 |

Notes:
(1) Exhibit B1, Tab 8, Schedule 2
(2) Exhibit B1, Tab 8, Schedule 6
(3) Exhibit B1, Tab 8, Schedule 7

UNION GAS LIMITED
O&M Expense Lead Summary
Study Year - Calendar 2004

| Line No | Particulars ($000's) | Amount (a) | Revenue Lag (Days) (b) | Dollar Days (c) = (a) x (b) |
|---|---|---|---|---|
| 1 | Salaries & Wages (1) | 149,661 | 14.2 | 2,123,692 |
| 2 | Employee Benefits (2) | 42,736 | 14.5 | 619,593 |
| 3 | Other O&M (3) | 155,569 | 18.2 | 2,823,840 |
| 4 | Total | 347,967 | 16.0 | 5,567,125 |

Notes:
(1) Exhibit B1, Tab 8, Schedule 8
(2) Exhibit B1, Tab 8, Schedule 9
(3) Exhibit B1, Tab 8, Schedule 10

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Tab 8, Schedule 8 and Schedule 9

a) Update 2010 Study year (2011 actual 2012 Bridge year estimate) Compare to Board Approved.

b) Please provide detailed explanatory notes.

---

**Response:**

a) & b) Union declines to provide the information requested on the basis that the updated information will have no material impact while consuming considerable time and resources to complete.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit B1, Tab 1, page 6

Union's rate base is projected to be $3,741.5 million for the 2013 Test Year. Of this, $157 million is gas in storage and line pack gas (item #2). What is the forecasted average cost of gas for this line item?

---

**Response:**

The forecasted average cost of gas for this line item is $5.37/GJ.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 3/Pg 8 and Exh B1/Summary Schedule 2/Pg 4

Union states it is forecasting modest increases in customer attachments over the 2011 and 2012 period (Exh B1/Tab 3/Pg 8). Further, Union states that the individual project economics are produced for each project before the actual expenditure is undertaken (Exh B1/Summary Schedule 2/Pg 4). Please outline the timing of these projects and whether any of these projects had been considered previously (and the year in which these projects were previously considered). For example, were any of these projects rejected because they failed to satisfy the profitability index but have now been reconsidered and deemed to be sufficiently profitable?

---

**Response:**

Union completes individual project economics for any project where main extensions are required, at the time the project is initiated as a result of requests from home builders, developers, or customers. Economic models are not prepared for most projects at the time capital budgets are developed. Instead, Union relies primarily on macro forecasts and expected capital cost per attachment to develop the budget.

For major community expansion projects that are expected to cost over $0.5 million, if interest has been expressed prior to the capital budget being finalized, project economics are prepared in order to determine whether to include the project in the budget.

The Red Lake project is the only major community expansion project included in the 2012 or 2013 capital forecast. The community portion of this expansion project had been considered several times in the past, and was submitted for and received OEB approval in March 2000 (RP-1999-0059 and RP-1999-0527). However, the funding partners at the time were unable to secure the required contributions in aid of construction, so the project was cancelled. Circumstances changed during 2011 when a large industrial “anchor” customer who had expanded operations indicated a willingness to pay a substantial aid to construction to bring gas to their facility.

At the time 2012/2013 capital forecasts were prepared, it was expected this large industrial load would significantly reduce the economic shortfall of expanding service to other customers in the communities. Union believed there was a high probability that the remaining shortfall could be managed through a combination of federal and provincial funding or some form of Aid to Construction to make the project economic. As a result, the mainline and industrial service (phase 1) was initiated in 2011, and the community portion of the project (phase 2) was added to the 2012 capital budget.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit B1, Tab 4, page 9

Union states that "transportation replacement at Union is aligned with Spectra Energy Vehicle Replacement Guidelines which are intended to create a balance between age-related maintenance and replacement costs. Union's guidelines were reviewed and validated by a third party vendor, PHH Strategic Consulting".

a) Please briefly explain the guidelines that Union uses to "create a balance between age-related maintenance and replacement costs" for transportation assets.

b) Please provide a copy of the PHH report which "validated" those guidelines.

c) Has Union developed similar guidelines for balancing age-related maintenance and replacement costs for gas distribution, storage and transmission assets? If so, please explain in detail. If not, please explain why such guidelines apply only to the relatively small category of transportation assets.

d) If Union does not have specific guidelines for balancing maintenance and capital replacement costs, what criteria does Union use for ensuring that all distribution, storage and transmission capital replacements are in fact prudent, and that relevant distribution, storage and transmission services could not continue to be provided more cost-effectively through additional or optimized maintenance activities rather than by replacing the aged facilities? Please explain in detail.

e) Is Union's approach towards maintaining vs. replacing aged facilities different under the IRM that has been in effect since 2008, compared to the years immediately preceding the implementation of the IRM? Please explain why or why not.

---

**Response:**

a) Union's guidelines on vehicle replacement are based on the vehicle age and mileage. Replacement cycles vary by vehicle class. However, the majority of vehicles (i.e cars, pickup trucks, light vans) are on a 5-year or 160,000 km cycle. There may be exceptions to this practice depending on historical maintenance, job function, geographic location and operating and maintenance costs.

b) Please see Attachment 1.

c) No. While age is a factor to consider when assessing the various assets for replacement, other factors play a bigger role, as outlined in the response to part d) below.

d) Union's practice for assessing when assets need to be replaced or repaired takes into account a number of factors, including the condition of the assets, based on input from various condition monitoring activities such as leak surveys, pipeline pigging results, ECDA results, and investigative digs that are completed. Union uses a financial model to make decisions to replace pipe versus continuing to maintain and repair it where it is warranted, but it also considers other key factors including coordination with municipal roadwork, criticality of the pipeline and severity of consequences associated with it.

Union uses a number of categories as the key drivers for replacement, as summarized in the evidence for the Budget process under Exhibit A2, Tab3, Schedule 1. One of these categories is "risk based" maintenance capital. Union's risk ranking process for projects identified under this category takes into account the risk imposed by a hazard considering both the likelihood and consequence of an event happening. All relevant consequences are identified and associated severity levels estimated. The consequence with the highest severity shall take precedent for the assessment. The likelihood of the hazard is estimated based on available statistics and/or past experience. The risk level for each hazard is determined as the intersection of the likelihood and highest severity consequence on the risk matrix. Risk rankings are reviewed by project managers and Engineering to ensure consistency in the application of the process.

e) No. IRM had no bearing on Union's approach towards maintaining or replacing aged facilities.

Filed: 2012-05-04
EB-2011-0210
J.B-4-1-3
Attachment 1

# Union Gas Replacement Optimization Analysis and Replacement Forecast

By Greg Corrigan

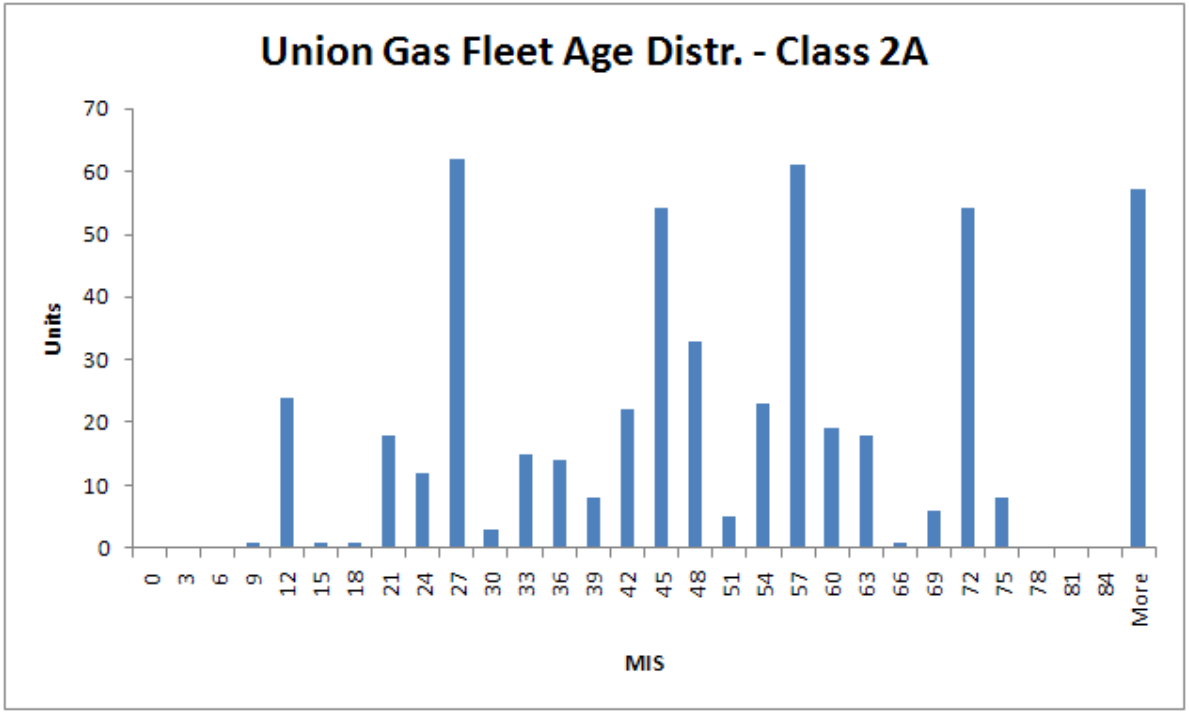
PHH Strategic Consulting

# Introduction

- Two-step approach:
  - Optimal replacement by Application
  - Apply optimal replacement to existing inventory to project replacement
- Looked at two primary applications:
  - Class 2A – 520 vehicles
  - Class 3D – 237 vehicles (180 Ford Light and medium duty trucks, 57 Heavy towing vehicles)

# Class 2A

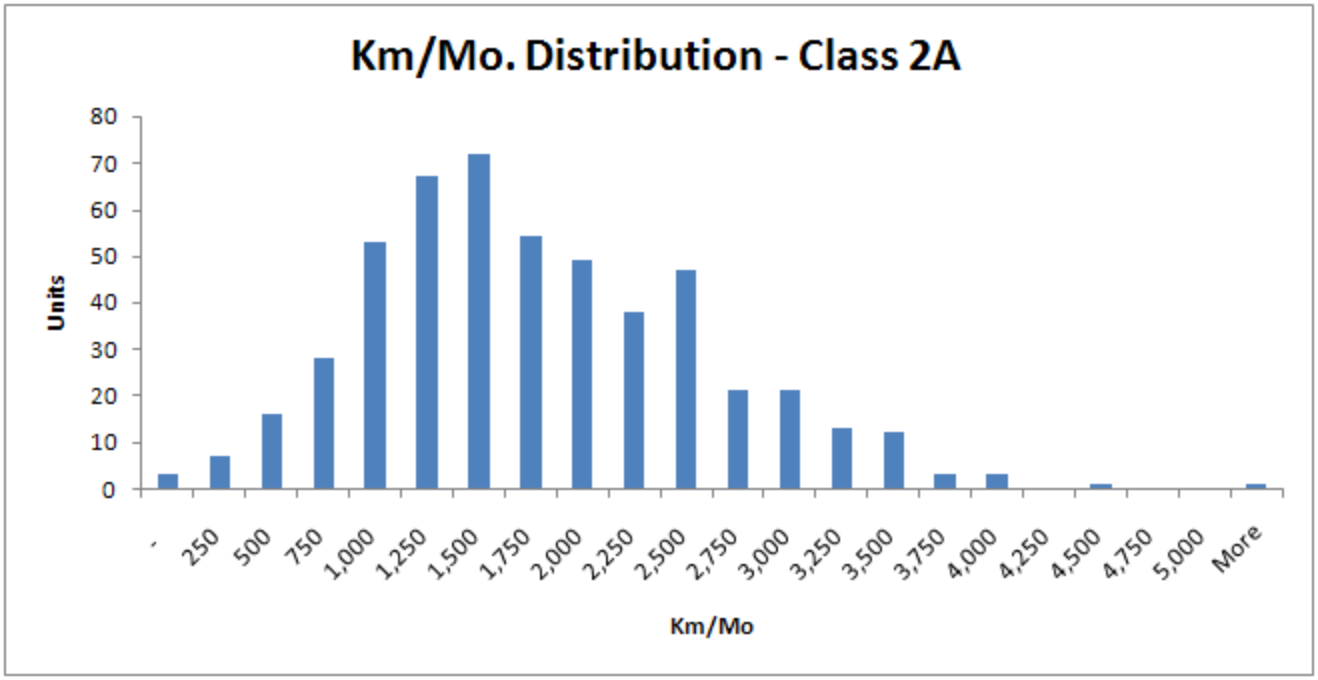
- The following slides show the current stats on the Class 2A vehicles
- Age distribution, Maintenance by age group:



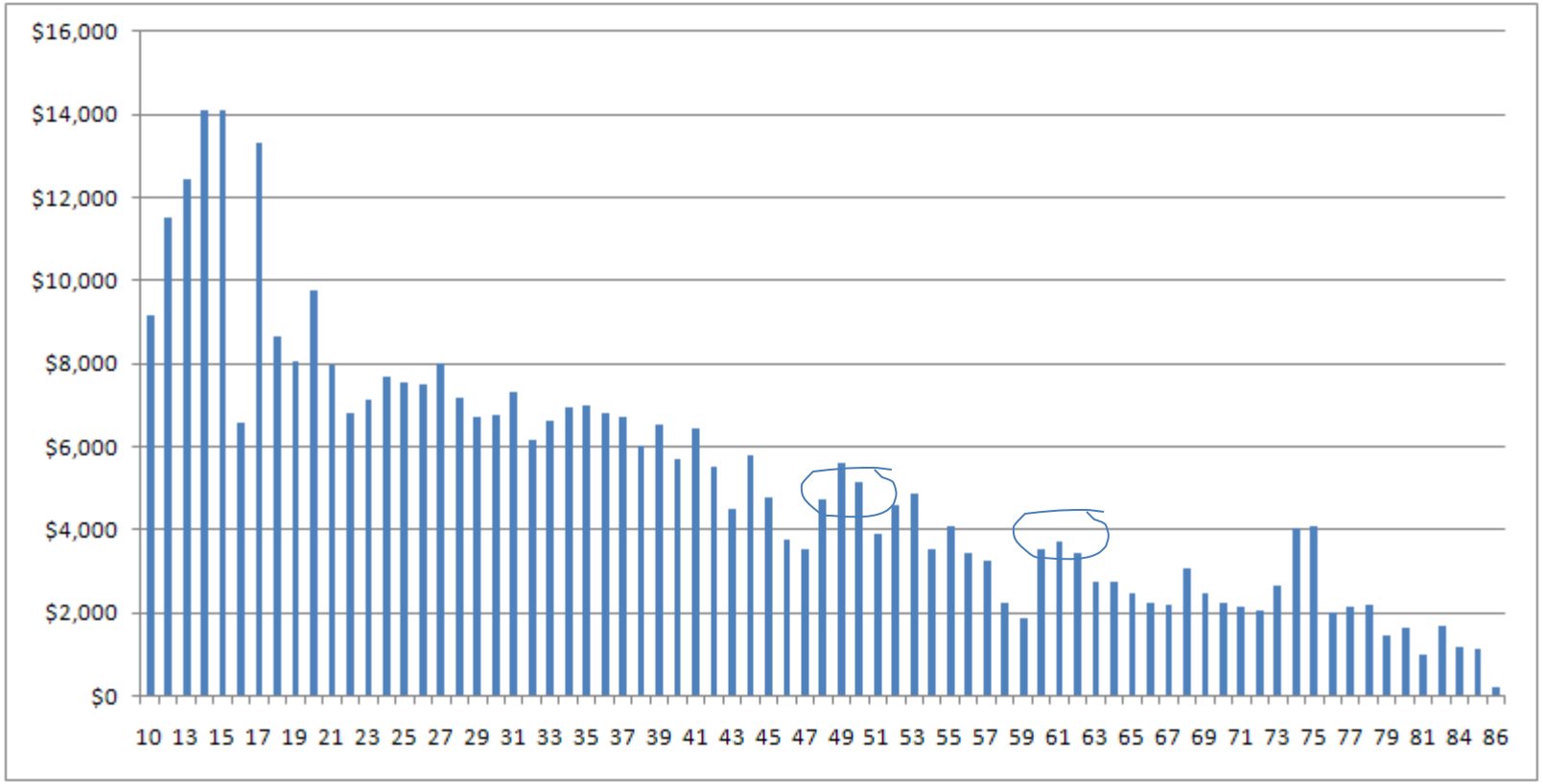

| Age Group | # Units | Average of 2009 Maintenance |
|---|---|---|
| 0-12 | 32 | $747 |
| 12-24 | 60 | $2,097 |
| 24-36 | 171 | $2,265 |
| 36-48 | 154 | $3,168 |
| 48-60 | 151 | $4,189 |
| 60-72 | 102 | $4,224 |
| 72-84 | 9 | $3,371 |
| 84-Up | 132 | $4,605 |

# Class 2A – Km/Mo. Distribution

- Normal distribution



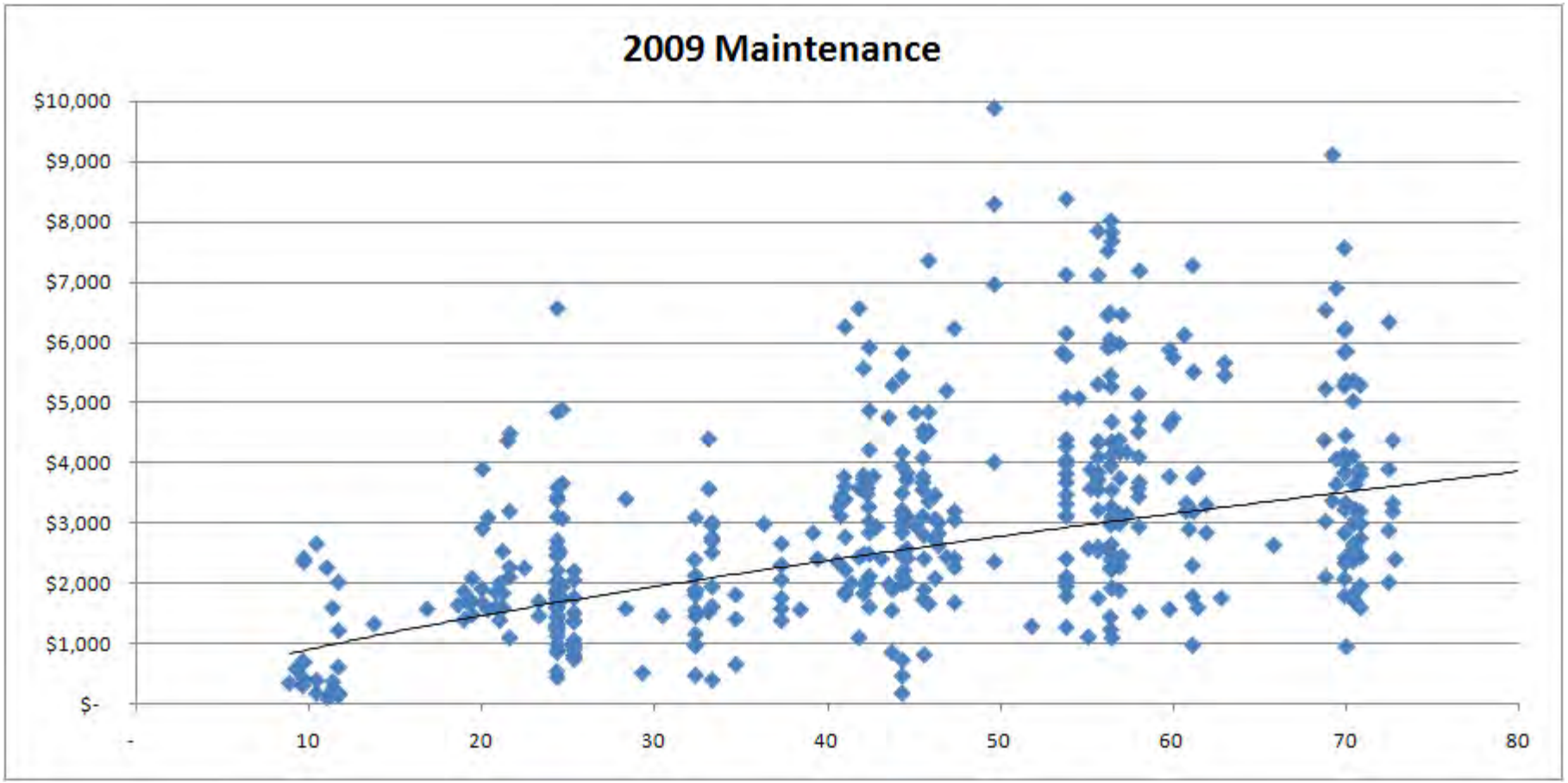
# Class 2A Projected Resale Values




- Lifetime depreciation at 48 Months: $300/Mo.
- Lifetime depreciation at 60 Months: $270/Mo.
- Rate of maintenance cost increase at 60 months = $30/mo

# Class 2A Maintenance Spend
# (Total Spend for the prior 12 months)

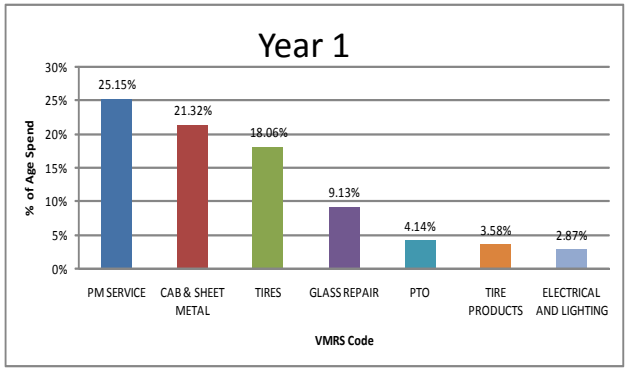
- The following table shows the total maintenance spend for the 12 months of CY 2009, broken down by vehicle age (months in service):

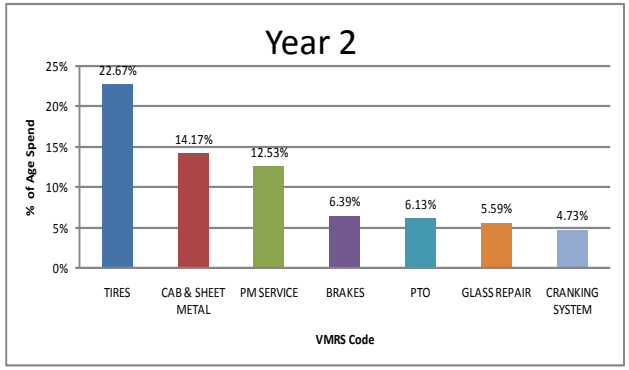


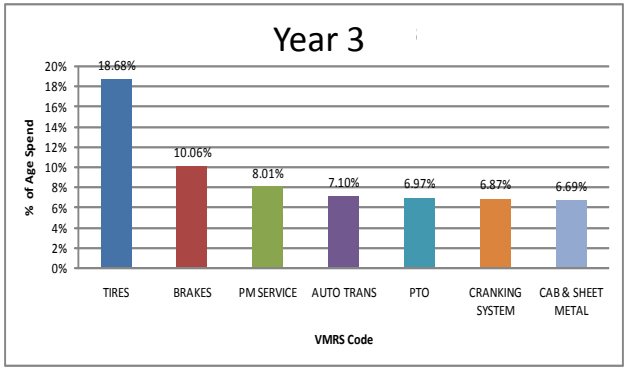
# Maintenance Benchmark

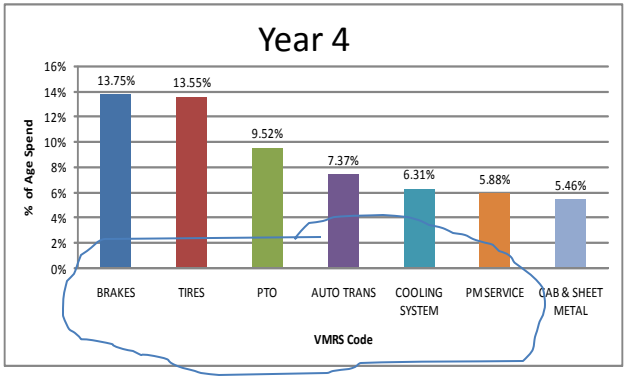
- The following slide shows maintenance spend by category, to show the relative changes in repair types over time, to help get at the driver down time equation:

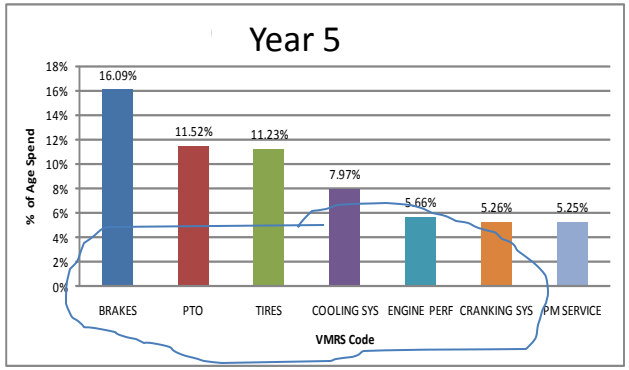
# Maintenance Overview – Cargo Vans, Pick-ups (E-250/350, F-150-350)

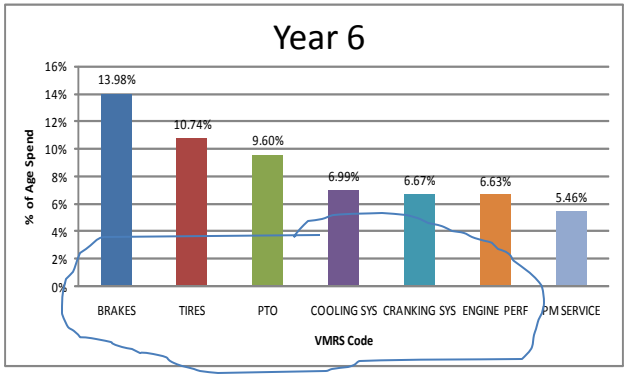


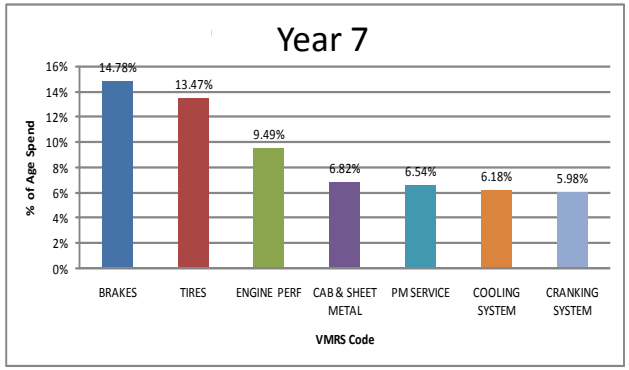



# Down time Assumptions – Union Gas (Excludes Scheduled or Preventive Maintenance)

1. Service/wrecker call with less than 2 hours of work (assuming that the driver waits for the repair)
   - .5 to 1 hour waiting for service vehicle to arrive
   - Maximum of 2 hour repair
   - **Total 3 hours lost productivity**
2. Service/wrecker call with more than 2 hours of work (assuming that the driver is assigned to another vehicle)
   - .5 to 1 hour waiting for service vehicle to arrive
   - 1 hour travel to service garage
   - 1 hour of 1st Reps time for pick up
   - 1 hour of 2nd Reps time for pick up
   - 1 hour for pick up and travel to next job
   - **Total 5 hours lost productivity**
3. Vehicle dropped off (driver takes to garage) at a repair facility with less than 1 hour of work ( assuming that the driver waits for the repair )
   - 1 hour travel to service garage
   - Maximum 1 hour of repair
   - 1 hour travel to next job
   - **Total 3 hours lost productivity**
4. Vehicle dropped off (driver takes to garage) at a repair facility with more than 1 hour of work ( assuming that the driver is assigned to another vehicle or duties )
   - 1 hour travel to service garage
   - 1 hour of 1st Reps time for pick up
   - 1 hour of 2nd Reps time for pick up
   - 1 hour for pick up and travel to next job
   - **Total 4 hours lost productivity**

- **Category 1 and 3 = 75% of incidents; category 2 and 4 = 25%**

# Incident Types

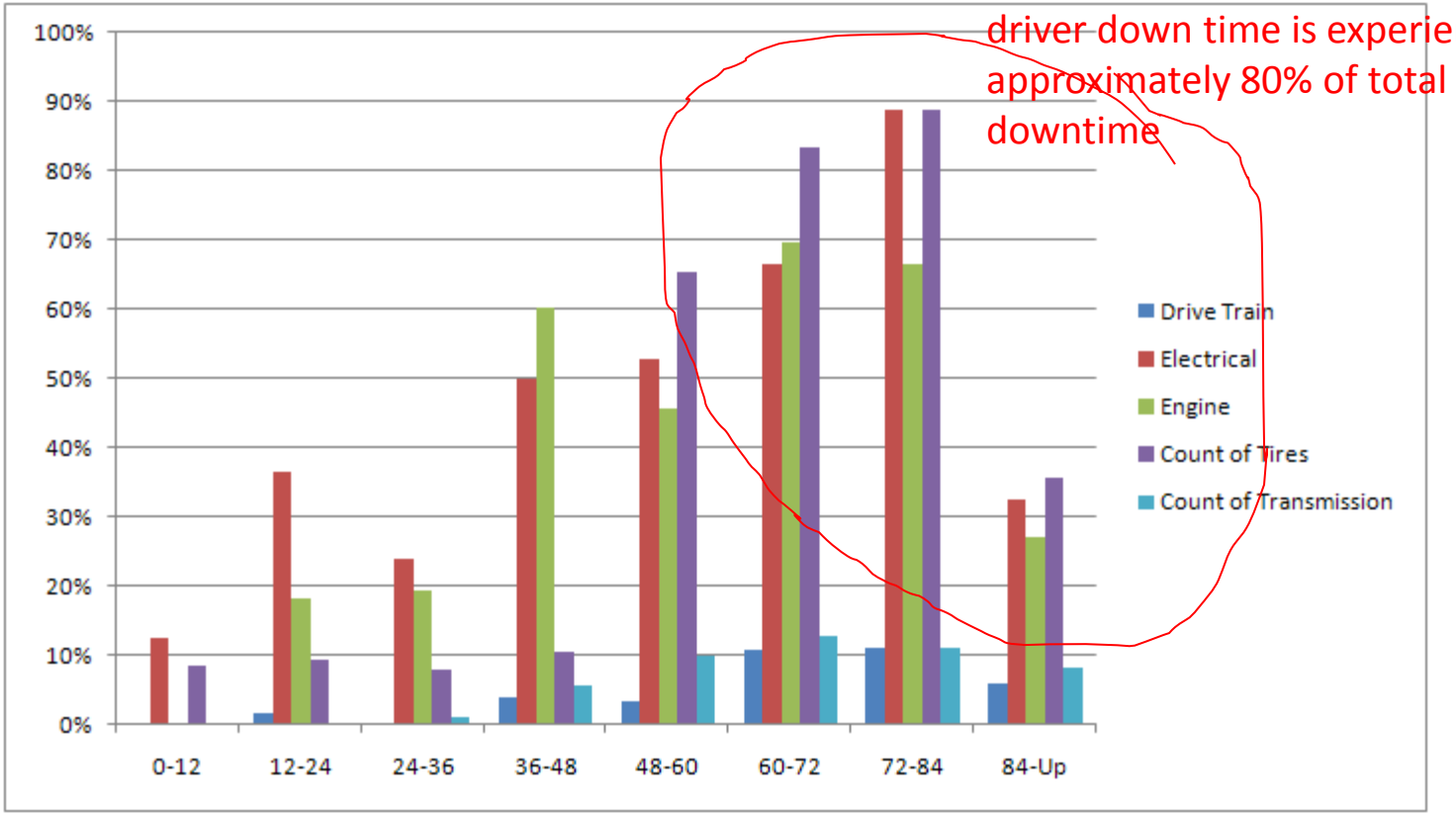
- The following table shows Union Gas' breakdown of repair types by incident count:

| Vehicle Class | A/C | Brakes | Drive Train | Electrical | Engine | Glass | Misc (uncategorized) | PM | Suspension | Tires | Transmission |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2A | 33 | 439 | 32 | 343 | 319 | 59 | 500 | 506 | 156 | 495 | 51 |
| 3D | 22 | 170 | 45 | 179 | 183 | 22 | 230 | 227 | 72 | 187 | 20 |
| **Grand Total** | **55** | **609** | **77** | **522** | **502** | **81** | **730** | **733** | **228** | **682** | **71** |

- Observations:
  - Miscellaneous are repairs that were not properly coded by the repair facility. Most of the time this is scheduled maintenance work.
  - Unscheduled maintenance largely comes from the following categories: Drive Train, Electrical, Engine, Tires (15% of incidents are blowouts or damaged tires) and transmission. This accounted for 29% of repairs in CY 2009 or 1,274 incidents.
  - Based on the previous slide, the cost of downtime to Union Gas was:
    - 75% lost 3 hours
    - 25% lost 4.5 hours
    - Total Cost = .75 x 1,274 x 3 hours x $82.15 = $235,500
    - Total Cost = .25 x 1,274 x 4.5 hours x $82.15 = $117,700
    - Weighted average down time per incident: 3.5 hours
    - **Total Productivity Impact = $353,300**
    - **Class 2A: $227,121**
    - **Class 3D: $126,178**

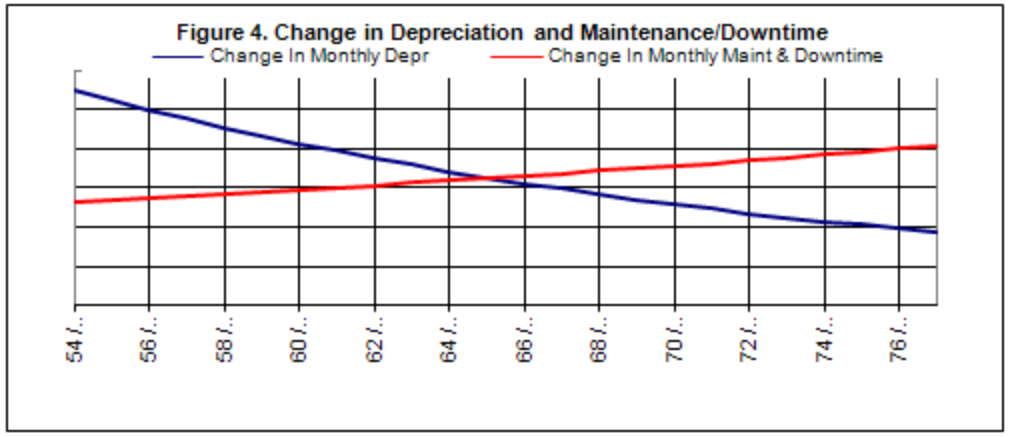
# Unscheduled maintenance weighted by Fleet size and Age distribution

- This chart breaks down the percentage of incidents taking place in each age band, as a percentage of the total vehicles in that band:



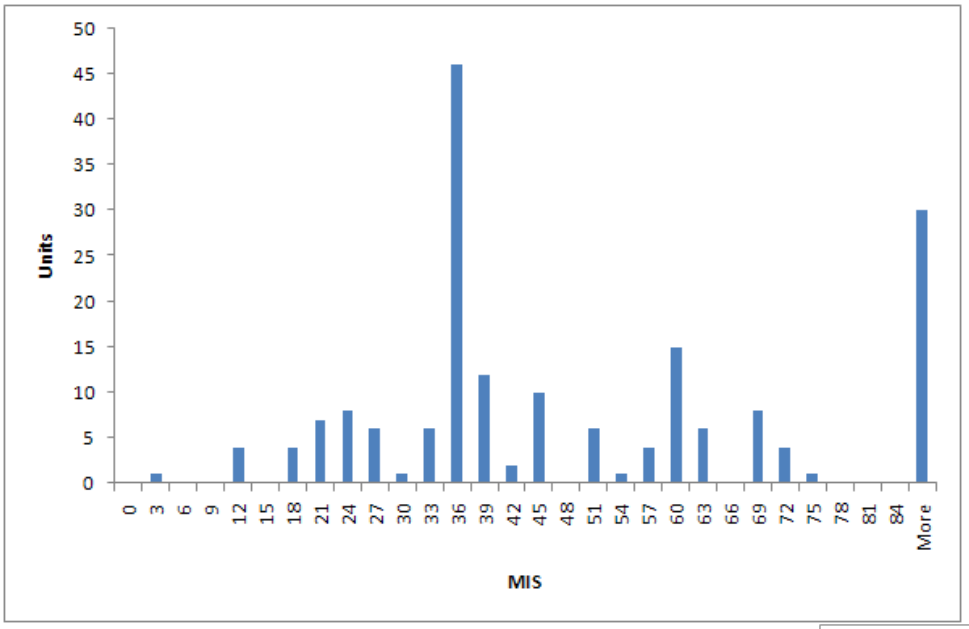
# Class 2A Recommendation

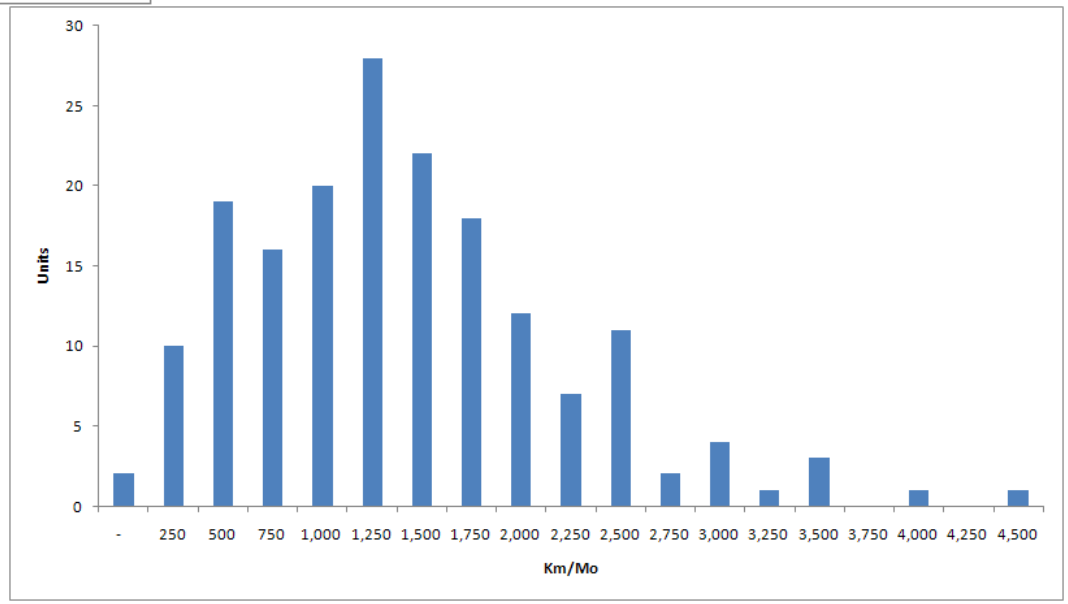
- Optimal replacement (excluding down time) is 60 Months, maximum 150,000 Km
- Including down time, would be 48-54 months, maximum 125,000 Km
- At 60 months, the following replacements would be projected:
  - Replacement Months only: 209
  - Replacement Km only: 107
  - Both criteria: 91
- Breakdown by model:
  - E-350s: 24
  - E-250s: 20
  - F-150s: 16
  - F-250s: 14 (includes HDs and SDs)



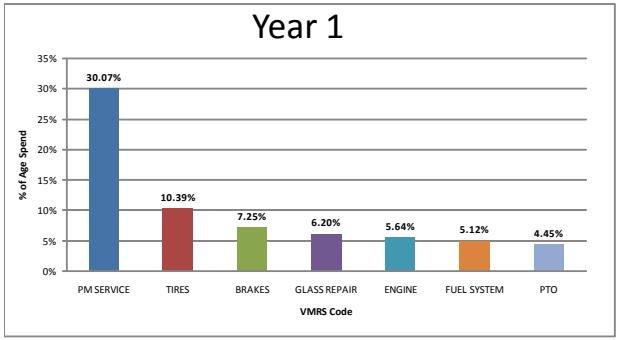

- Year 1 savings: 91 x $3,200 maintenance cost reduction = $291,000
- Year 1 productivity savings: 1.4 incidents * 91 * 3.5 hours/inc x $82.15 = $36,630
- Resale Proceeds: $3,500 * 91 = $318,500
- Total savings: $646,130
- Cost of New vehicles: $3.8MM (approximate)
- Net Year 1 Cost: $3.2MM

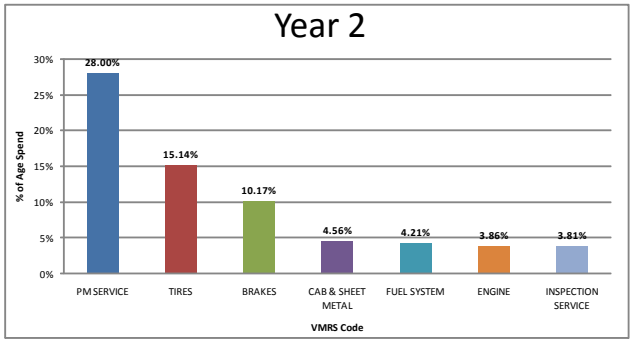
# Class 3D Age and Odometer Distribution (Ford only)

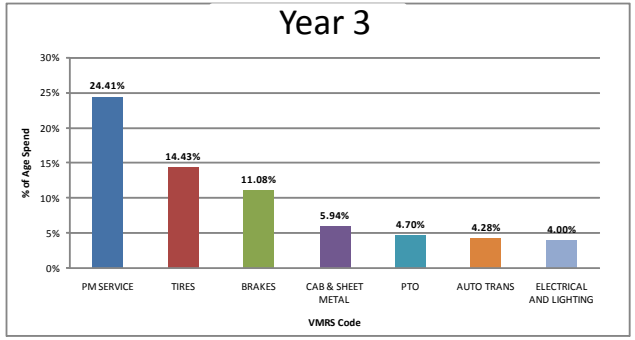


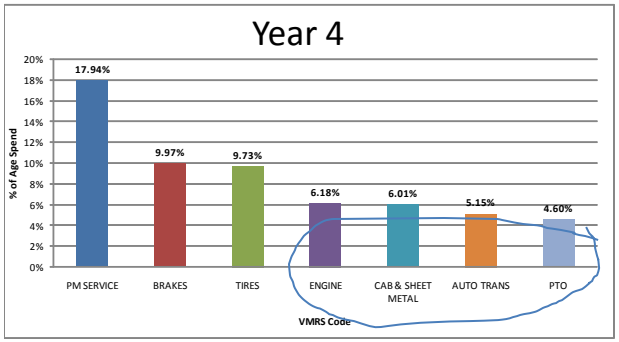



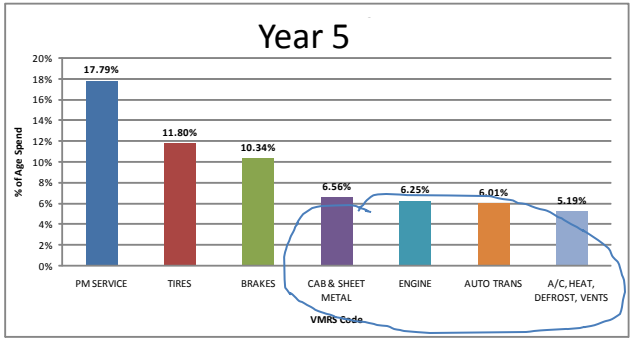
# Maintenance Overview – Light and Medium-duty diesel trucks

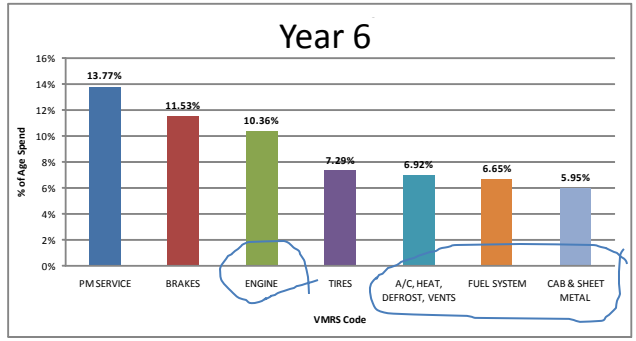


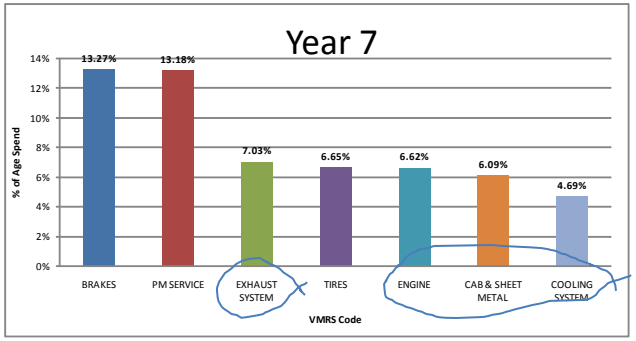



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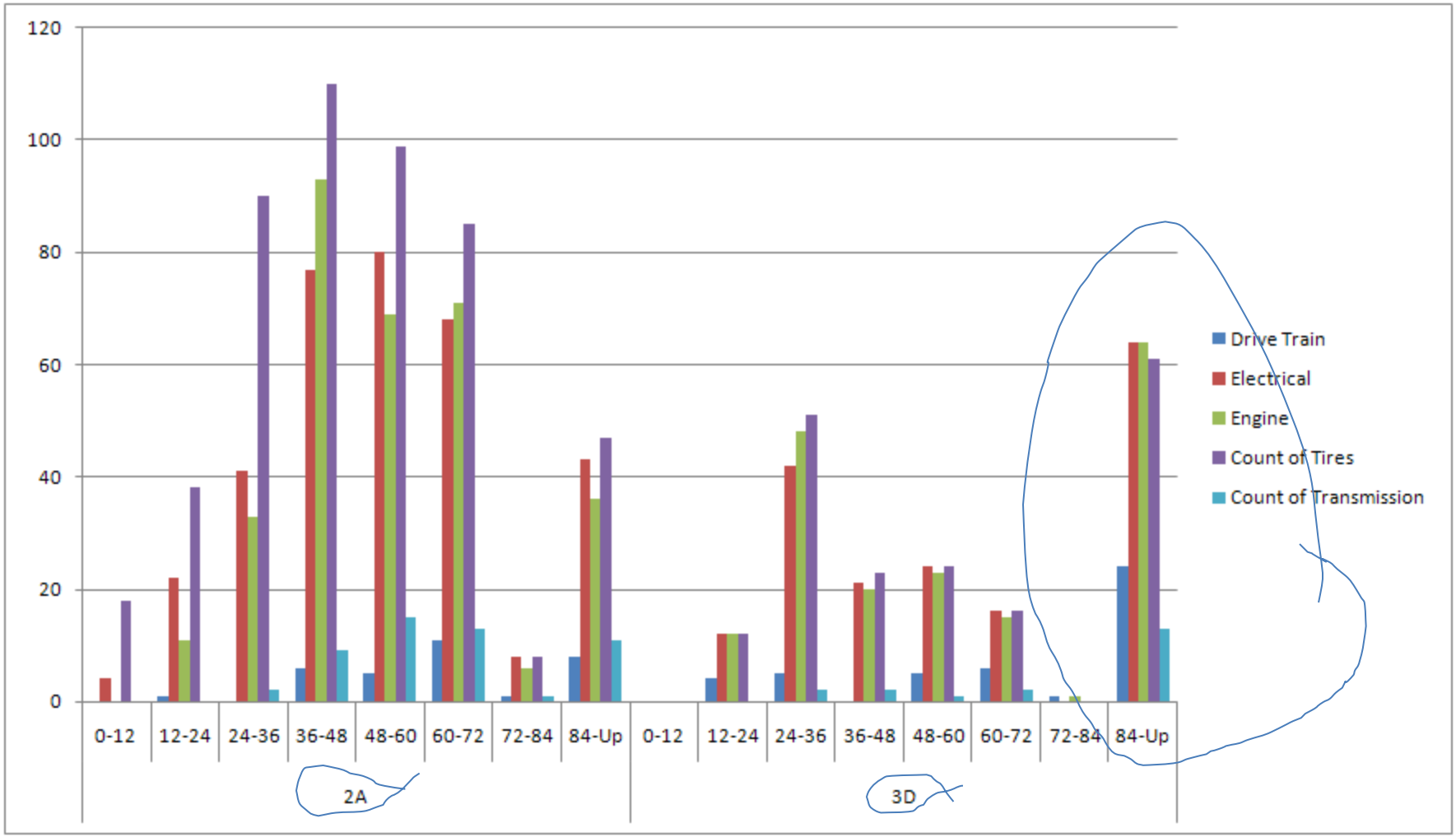
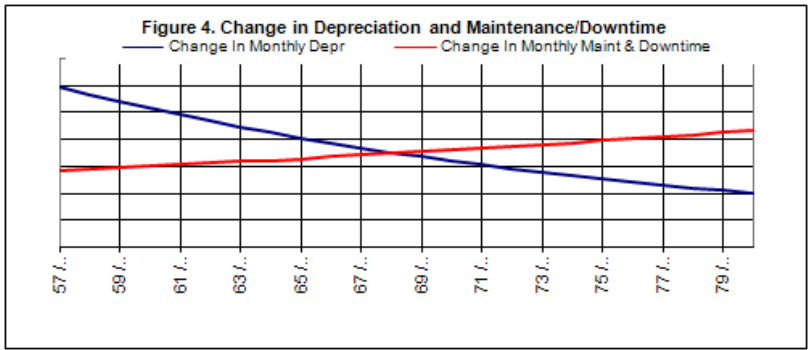
# Unscheduled maintenance weighted by Fleet Size and Age distribution



# Class 3D Recommendation

- Optimal replacement is 72 Months, 150,000 Km (if you stay with diesels, see next slide)
- Rationale: Your Class 3Ds operate slightly fewer Km on average than your Class 2As, and will therefore hit the age criteria before the odometer. However, the Class 3D vehicles can idle up to 15 hrs./week, on average, which adds 675 Km/week to the wear and tear on the engine.
- Being primarily diesels, the engines will still have life, but the remainder of the cab chassis will begin to increase driver down time beyond these levels
- At this level, the following replacements would be projected:
  - Replacement Months only: 35 vehicles
  - Replacement Km only: 12 vehicles
  - Both criteria: 7 vehicles
- Primarily F-350-550
- Year 1 savings: 35 x $4,800 maintenance cost reduction = $168,000
- Year 1 productivity savings: 1.4 incidents * 35 * 3.5 hours/inc x $82.15 = $14,000
- Resale Proceeds: $4,500 * 35 = $157,000
- Total savings: $339,000
- Cost of New vehicles: $1.3MM (approximate)
- Net Year 1 Cost: $1.0MM



# Class 3D recommendation, cont.

- Recommendation 1: Do not continue paying a premium for diesel. At these low odometer levels, there is no case to be made for driving diesel, unless the power requirement dictates it. The improved fuel efficiency of diesel is offset by the increased cost, so on a life cycle basis, the diesel will end up costing more than $10,000 than a gasoline equivalent.
- Recommendation 2: Consider re-deploying current diesel vehicles to applications where the older assets are currently located, and replace them with regular gasoline engine vehicles. Keep your existing diesels in service 84 to 96 months with this life extension strategy.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit B1, Tab 6, page 1

Union states that its approach towards integrity management "continues to evolve from the initial focus of assessing the pipe to a broader perspective with increased expectations and costs".

a) Please explain in detail how Union's "broader perspective" factors expectations and costs into its integrity management programs.

b) Was this change in approach a result of internal management decisions within Union, or motivated by Union's parent company Spectra?

c) Did this change in approach depend on any changes in Union's economic, policy or regulatory environment, such as the need to deal with new government safety mandates or the adoption of IRM in 2008? Please explain.

d) Also, please explain how Union evaluates and quantifies the incremental costs and incremental benefits of actions designed to maintain or improve the integrity of its assets.

---

**Response:**

a) The reference to "broader perspective" reflects that integrity management programs look at integrating a number of different aspects related to how assets are managed and operated. Beyond assessing the existing condition of the piping through pigging and other assessment methods, the programs look at how the assets were designed, constructed, operated and maintained through their full life cycle in assessing their suitability for continued service. It also reflects the inclusion of all of the asset groups beyond the initial focus on the higher stress pipelines.

   Steps that may need to be taken to address issues from the assessments, may not be directly reflected within the integrity management program costs, but as part of the overall O&M cost or maintenance capital cost for specific projects to replace specific parts of the assets to address integrity issues, such as the Owen Sound Line Replacement Project.

   With some of the industry incidents over the past few years, the expectations of what the operating company will check for and detect has been increasing. The application of different types of tools to detect specific anomalies has been highlighted. This will continue to drive the costs of these inspections higher.

Items such as the need to complete competency assessments on the workers completing the work has lead to the development of the competency assessment programs (CAP) to more objectively demonstrate that the workers are able to complete work in a safe manner.

b) The change was a result of an internal Union management decision.

c) The change resulted from a change in operating code and regulatory requirements. This led Union to look at the full life cycle and incorporate a management system approach to managing the assets.

d) Costs are a result of implementing the requirements of the program to either manage compliance or risk associated with the assets, to ensure that Union continues to provide safe and reliable service to its customers.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit B1, Tab 6, page 2

Union forecasts that the Pipeline Integrity Management Program for the 2002-2011 period was estimated to cost $75.5 million in capital and $16.0 million in O&M expenses, and the actual costs over this period (which includes the 2011 outlook) were $82.1 million in capital and $16.4 million in O&M, which was slightly higher than the original costs primarily due to additional repairs designed to address the results of an assessment of the IMP.

a) Please provide the projected and actual capital expenditures associated with the IMP in each year from 2002 to 2011, inclusive. Please explain any significant discrepancies associated with differences between actual and projected capital expenditures in each of these years.

b) Please provide the projected and actual O&M expenditures associated with the IMP in each year from 2002 to 2011, inclusive. Please explain any significant discrepancies associated with differences between actual and projected O&M expenditures in each of these years.

c) Please discuss the "additional repairs" that were identified by an assessment of the IMP and the costs associated with these additional repairs.

---

**Response:**

a) Table 2 of Exhibit B1, Tab 6 shows the actual annual costs compared to the EB-2005-0520 plan that shows the projected costs. The variances between the actual and plan capital costs were due to the level of complexity to make the lines piggable or remediation that had to be completed on the portions of the system that were being assessed.

b) As per response to a) above, Table 2 shows the requested costs. The variances between the actual and plan O&M costs were due to the level of complexity to complete the inspections or remediation that had to be done on the portions of the system that were being assessed.

c) On a number of the pipelines, Union found a higher level of inspection anomalies or defects that had to be investigated with physical digs. This was a result of the condition of the lines being assessed, the improvements in pigging technology to detect the anomalies, and the application of more formal practices for following up on anomalies.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 6/Pgs 6 and 7

Union states that, for relatively old gas lines installed in the 1950s and 1960s, "a significant amount of work, along with associated capital cost, has been required to remove obstructions in the line and make them "piggable"". Please provide a detailed explanation of the analyses and criteria that Union uses to evaluate whether investments should be made to make lines "piggable," relative to the operating expenditures that would be incurred if ECDA was used to inspect lines.

---

**Response:**

As part of its baseline assessment approach, Union has targeted to use pigging as the preferred choice for inspecting the condition of the pipelines where it is practical to do so. The pipelines that were initially deemed as not being piggable or not worth trying to make piggable included:

- Pipelines that were NPS 6 or smaller in diameter
- Pipelines over NPS 6 in diameter that were less than 2 km long
- Pipelines over NPS 6 in diameter that were less than 10 km long, were not pig ready and were not deemed susceptible to internal corrosion
- Other shorter pipelines that were going to be a challenge to make piggable due to configuration, or for which the operating characteristics of the pipeline, such as flow rates and pressure, are such that a pig speed could not be maintained in the range at which useful data could be picked up through the inspection

If for any given pipeline there were issues identified through the External Corrosion Direct Assessment ("ECDA") process that needed further review, then the pipeline was considered for a pigging inspection. Likewise, if after further reviewing the characteristics of a pipeline it was assessed that a successful pig run could not be made, then the line could be considered for an ECDA inspection.

With some of the investigations of recent incidents in North America, there continues to be more emphasis placed on advancing pigging technology and using pigging as the preferred method for completion of the integrity assessments. Union will continue to use its experience and monitor industry developments in assessing the right methods to use for the integrity assessments. This may include removing further fittings or pipeline configurations through which there have been challenges in maintaining pigging speed to enhance the quality of the data that is captured during the inspections.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 6/Pg 8

a) Please provide data on the portion of capital expenditures presented in Table 2 specifically designed to facilitate "pigging," as well as the portion of operating expenditures presented in Table 2 specifically related to ECDA, in each year from 2002 through 2011.

b) Have increased capital expenditures needed to make lines "piggable" led to a subsequent decline in ECDA opex? Please explain.

---

**Response:**

a) The following table includes the breakdown of capital cost to facilitate pigging and O&M cost related to the External Corrosion Direct Assessment ("ECDA") by year.

| Year | Capital Cost to Facilitate Pigging ($000's) | ECDA O&M Cost ($000's) |
|---|---|---|
| 2002 | 7,930 | 0 |
| 2003 | 6,723 | 0 |
| 2004 | 6,494 | 98 |
| 2005 | 9,534 | 451 |
| 2006 | 6,937 | 812 |
| 2007 | 6,258 | 432 |
| 2008 | 5,451 | 623 |
| 2009 | 3,624 | 434 |
| 2010 | 3,138 | 391 |
| 2011 | 3,683 | 419 |

b) No. The lines targeted to make piggable and those targeted to be assessed through ECDA are generally in separate buckets, as described in response at Exhibit J.B-4-1-6.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 6/Pg 14

Union states that there "has been an increased effort to reduce the amount of leaks on Union's distribution piping, primarily due to corrosion. Union has increased the level of O&M and capital spending to repair leaks and replace parts of the system that are of highest risk and can be best addressed through replacement." Please explain the precise criteria that Union uses to determine when parts of the system experiencing leaks "can be best addressed through replacement" rather than through O&M expenditures necessary to locate and repair leaks.

---

**Response:**

Please see the response at Exhibit J.B-4-1-3 d).

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 6/Pg 15

Union's Table 6 presents data on distribution asset capital and O&M expenditures between 2007 and 2013. The data show a pronounced increase in capital expenditures in 2009 to $6.95 million from an average of $0.87 million per year in 2007-08. After 2009, annual capital expenditures average $7.37 million while annual O&M expenditures experience a steady upward rise from $0.51 million in 2010 to $3.28 million in 2013. Since replacing a leaking distribution pipe is typically viewed as a substitute for the O&M costs associated with repairing distribution leaks, shouldn't we expect to see distribution integrity O&M costs decline after the large capital expenditures made over the 2009-2013 period, not increase? Please explain why this has not, and is not projected to be, the case.

---

**Response:**

The increase in spending reflects more focus being put on distribution integrity as part of the implementation of distribution integrity management. The added emphasis on replacing more pipe and at the same time completing more leak repairs is an effort to improve the overall integrity of the distribution piping.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit B1, Tab 6, pages 14 and 15

Union's Tables 5 and 6 presents data on distribution asset capital and O&M expenditures.

a) Please provide a summary of the actual number of leaks, and leak-related operating expenses, for the years 2007-2011, and projected number of leaks and leak-related operating expenses for the years 2012-2013.

b) If data are available, please provide this information segmented by the type of pipe: polyethylene, protected steel, unprotected steel, and cast-iron.

c) Please provide the km of distribution main that is constructed of polyethylene, protected steel, unprotected steel, and cast-iron, and calculate the number of leaks per km for each of these types of pipe, in each year from 2007 through 2013.

---

**Response:**

a) The average number of below ground leaks in the 2007-2011 period has been approximately 2,100 leaks per year. Union expects to find this level of leaks for the 2012-2013 time period. The annual operating leak related costs are included in the table below. These are costs associated with leak repair and do not include leak survey costs.

| Year | Leak Repair Costs ($000's) |
|---|---|
| 2007 - Actual | 1,046 |
| 2008 - Actual | 1,192 |
| 2009 - Actual | 1,378 |
| 2010 - Actual | 1,388 |
| 2011 - Actual | 1,871 |
| 2012 - Projected | 1,771 |
| 2013 - Projected | 1,788 |

b) This information is not readily available in the detail requested, but the approximate breakdown of leaks per material type is shown below

| | |
|---|---|
| Polyethylene | - 30 % of the total leaks |
| Protected Steel | - 25 % of the total leaks |
| Unprotected Steel | - 35 % of the total leaks |
| Cast Iron | - 0 |

The costs for each of the material categories would be in proportion to the percentage of the leaks.

c) The following is the breakdown of the approximate length of pipe at the end of 2011, including both mains and services, that operates at less than 30% SMYS. The Unprotected Steel category includes pipe that either doesn't have protective coating or cathodic protection to prevent corrosion.

| | |
|---|---|
| Polyethylene | - 37,380 km |
| Protected Steel | - 26,300 km |
| Unprotected Steel | - 1,150 km |
| Cast Iron | - 0 km |

Combining the above with the response to part b) the following is the calculated number of leaks per km by type of pipe material.

| | |
|---|---|
| Polyethylene | - 0.02 leaks/ km |
| Protected Steel | - 0.03 leaks/ km |
| Unprotected Steel | - 0.64 leaks/ km |

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit B1, Tab 6, page 17

Union's table 7 shows that there were no capital expenditures on station asset integrity between 2007 and 2010, but a significant increase in those expenditures over the 2011-2013 period. Is it reasonable to interpret at least part of the station asset integrity expenditures in 2011-2013 as a "catch-up" of expenditures that were deferred from earlier years? Please explain in detail.

---

**Response:**

No. It is not reasonable to interpret station asset integrity expenditures in 2011-2013 as a "catch-up" of expenditures that were deferred in earlier years.

Union has historically undertaken O&M and capital activities tied to stations that are included in the overall O&M and capital budgets for their general integrity and condition. Union is now putting additional focus on stations as part of its evolving and improving integrity programs. This identified funding is required for these assets to improve their integrity.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 7/Pg 2

Union states that the costs and benefits of alternative IT investments are prepared by different business sponsors, before investment "requests are placed into a rolling list where they are reviewed by Union's IT Capital Steering Committee. As resources become available, projects are given the approval to succeed".

a) This description seems to suggest that there is a given amount of funds available for IT investments in each year. Is this correct? If so, please describe how the total IT budget is established and updated in each year.

b) Is the total amount of budgeted funds always spent? Please explain.

c) Please describe in as much detail as possible how the "benefits" of IT investments are assessed and quantified.

---

**Response:**

a) The reference describes how funding or allotment of capital for IT projects gets approved by management. Only IT projects with the appropriate justification get approved. The main categories of IT capital justification are:

1. Economic - generates revenue or O&M savings
2. Compliance - required to comply with regulations or audit findings
3. Lifecycle - required due to technology obsolescence
4. Strategic - aligns with company objectives

The IT capital budget is established before all IT capital projects for a given year are approved. The IT capital budget sets the limit of what can be spent on IT projects for the year. IT capital projects might get approved for funding through the year that are different than what was considered when the capital budget was established.

The IT capital budget is established on the basis of IT having discussions with business leaders about what their future requirements are relative to the above types of justifications. The IT department then considers the input it has received relative to its own assessment of what capital budget amount would be appropriate giving regard to what can be reasonably justified by the business leaders, the IT department's expertise and capacity to do the work, past experience and past IT spending levels. The proposed budget is then submitted and

reviewed by multiple levels of IT management and is also vetted by the Finance department in the context of the overall financial forecast and what IT budget level can be supported. It is not uncommon for the IT capital budget to be adjusted through these reviews.

b) No, the IT capital budget is not always spent. For example, in 2011 the IT capital budget was $23.3 million. The actual spend was $22.9 million.

c) As described above there are four main categories of IT capital justification. How the benefits of IT investments are assessed and quantified differs for each.

1. Economic - are justified using the company's economic evaluation model. The Finance department in conjunction with the business area ensures that projected incremental revenues or O&M savings are included in the financial forecast

2. Compliance - requires the endorsement of the business area accountable for the compliance

3. Lifecycle - requires the approval of the technical subject matter expert accountable for the technology

4. Strategic - requires the approval of the senior mgr/Vice President responsible for the business area or steering committee responsible for the initiative

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 7/Pg 5

Union states that Enterprise Asset Management ("EAM") "is a Company-wide initiative that will result in a comprehensive solution to plan and control Union's assets throughout their life-cycle from acquisition through installation".

a) Are the assets referred to in this statement IT assets only, or do they include other assets? If so, please identify all types of Union assets that are included in Union's EAM.

b) When was the EAM initiated?

c) Was EAM initiated by Union managers or at the direction of Union's parent company Spectra? Please explain.

d) Please provide data on all operating and capital costs associated with developing and administering the EAM, including the costs of any outside consultants who may be advising Union on these issues.

e) Please provide any internal Company documents that describe or present related details on the EAM.

---

**Response:**

a) The Assets referenced are those employed by Union in the transmission, storage, and distribution of natural gas. IT assets are not in scope of this initiative.

b) A preliminary study conducted by CGI Consulting was completed in September 2010. The purpose of the study was to assess the viability of consolidating a number of Union's asset-based IT systems into an SAP EAM solution. A team was created in October of 2011 to begin scoping the EAM project and to create a business case.

c) EAM was initiated from within Union's Engineering, Construction, Storage and Transmission Departments.

d) A preliminary capital cost estimate for the project is $5 to $10 million. The scope of the EAM project has yet to be defined or approved.

To date, Union has engaged CGI consulting to help Union understand how it would consolidate and migrate its IT systems to an EAM solution ($211,000). Union has also engaged Vesta Partners to assess its current Asset Management processes and procedures and identify opportunities that could be addressed by an EAM project ($40,000).

e) Please see Attachments 1, 2 and 3.

Filed: 2012-05-04
EB-2011-0210
J.B-4-1-13
Attachment 1

Vesta PARTNERS

# Asset Management Strategy Assessment

## Focusing on Maintenance & Reliability

**Prepared For:**

uniongas

A Spectra Energy Company

# - Final Version -

**January 2012**

# Contents

## Introduction

Vesta Partners is pleased to provide the following Maintenance Management assessment report to Union Gas as it prepares to define a corporate asset management strategy. We found working with the Union Gas representatives to be both informative and productive. Overall we found that Union Gas clearly understands the principles of asset management. The most important area – to keep assets operating safely – is well entrenched in Union Gas's culture and day-to-day activities. The individuals we met with are also focused on delivering a high performing natural gas business that meets the requirements of all stakeholders including its employees, customers, and regulators.

Based on our interviews at Union Gas, we found a common understanding of what asset management represents, what is working well, and what needs to change. In particular, we found a strong level of desire to make changes that will improve efficiency. And although Vesta has identified a variety of challenges to be remedied, they are not unique to Union Gas and in fact can be found in varying degrees in most capital-intensive organizations.

The following document presents Vesta Partner's findings and recommendations to help Union Gas define and implement its corporate asset management strategy, and to ready itself for the implementation of SAP EAM as a key enabler of the strategy.

## Summary

In November of 2011, Vesta Partners was hired by Union Gas to conduct a "bottom-up" examination of Union Gas's maintenance & reliability practices which are a key element of its asset management strategy. The objective of the assessment is two-fold:

1) To identify gaps and opportunities across Union Gas's maintenance & reliability areas in support of an asset management strategy
2) To help identify value in moving to an integrated SAP Enterprise Asset Management (EAM) system

Working collaboratively with the core asset management team, three days of on-site interviews were conducted with various personnel across the Storage & Transmission (STO) and Distribution Operations (DistOps) lines of business. An extensive collection of supporting documentation was also provided to assist in gathering the data necessary to compile this report.

In addition, Vesta utilized key elements of its VTEAM (Vesta Total Enterprise Asset Management) methodology to support the assessment. Vesta's proprietary on-line Maintenance & Reliability benchmarking survey was also employed to gather additional insights into the current practices and perspectives of maintenance and reliability at Union Gas.

A cornerstone of Union Gas's asset management strategy is the Canadian Gas Association's (CGA) "Guiding Document on Asset Management" (November 2009) in which Union Gas (among other leading Utilities) participated in its development. The guide is prescriptive in nature and provides a framework for the implementation of a balanced asset management strategy in a gas delivery company. Vesta has attempted to relate its findings & recommendations to the structure of the CGA document in order to help Union Gas more readily digest what it needs to do to further build upon the CGA framework.

The Canadian Gas Association's Guiding Document on Asset Management provides the following definition of Asset Management. This definition is also aligned with Union Gas's Operations Management System (OMS) Element 4:

> "Asset management is a strategic management system used to optimally manage assets over their lifecycle by balancing performance, risk, and expenditures to achieve corporate strategic objectives."

Thus the primary objective of an asset management system or strategy is to maximize the lifetime value of Union Gas's assets in a way that is consistent with the company's strategic goals. For reference, we include below the strategic goals of both Union Gas and its parent company Spectra Energy.

Spectra Energy

- Supplier of choice for our customers
- Employer of choice for individuals
- Advisor of choice on policy and regulation for governments and regulators
- Partner of choice for our communities
- Investment opportunity of choice for investors

Union Gas

- Launch & aggressively grow the unregulated storage business.
- Deliver high performance in the natural gas delivery business.
- Aggressively pursue a regulatory environment that enhances opportunity and eliminates uncertainty.
- Build on our high performance culture and position ourselves for the future.

To help achieve the strategic goals of Union Gas and its parent, a successful asset management strategy will depend heavily on the involvement & coordination of the functional departments in Union Gas who most directly impact maintenance & reliability practices. They are:

- Maintenance
- Operations
- Contractors
- Engineering

- Inventory and Procurement
- Information Technology (Business Systems)

These also happen to be the key departments that influence all aspects of an asset's life cycle – from conception through to disposal.

When it comes to defining the asset management strategy, Vesta recommends that Union Gas take a holistic view. However, the implementation of the asset strategy should be phased (vs. big bang) with the focus initially on STO and within that, a subset of critical equipment, to prove out the key elements of the strategy. It is Vesta's belief that the scope of the business transformation for STO in preparing for and implementing an asset management strategy will be more complex relative to DistOps. We also believe that the opportunity for improvement and therefore the benefits / payback to Union Gas will be greater in STO. It is also important to keep in mind that the asset management strategy for STO many not be entirely suitable for DistOps. Implementing an asset management program is not a "one-solution-fits-all" proposition as each line of business has different needs, drivers, technical requirements, and circumstances.

## Summary of Findings

The following is the summary of Vesta's key findings and recommendations to help Union Gas further develop its asset management strategy, and to prepare for the implementation of SAP EAM as an enabler of the strategy.

### 1. Need for Improved Communications Between Engineering, Maintenance, and Operations

This is a key area for companies moving from maintenance management to an *asset* management paradigm. Each of the functional departments that impact the asset must communicate with the other departments that also influence the asset's performance (as further described in the section entitled Asset Life Cycle Management). For example, unless the operations and maintenance groups collect data on the performance of the assets, they have no information to feed back into the engineering department to improve the performance of the next generation of the company's assets. Without this on-going dialog, hand-offs are missed and there is often duplication of effort. This was observed and discussed during the site visits at Union Gas. This was also an underlying theme of some of the responses in the benchmarking survey. Unless the lines of communication between departments are formalized and a clear understanding of their interdependencies is instituted, there will be missed opportunities to improve the management of assets at the appropriate cost levels.

There are several indicators that we found which point to this finding: Lack of collaboration between Operations and Engineering during the planning stages of a

capital (construction) project; Blurred lines of responsibility between Operations and Maintenance at Dawn (e.g. Mechanics having to do operator rounds on far-off units); Asset information hand-over to Operations and Maintenance on capital projects is not well done (e.g. Lobo – it's in one person's head and not in the system); Lack of alignment in who is the "Customer" in C&G is contributing to siloed processes; 41% of survey respondents reported that communication between these groups takes place occasionally, seldom, or never.

## 2. Lack of Maintenance Processes at Dawn

Good work is being accomplished at Dawn and the other compressor stations but there was an obvious lack of viewing "maintenance as a business". The following observations lend themselves to this finding:

a. **Planning and Scheduling** – Overall, planning and scheduling can use attention at Union Gas but at Dawn little to no formal planning and scheduling occurs. Most work is reactive with technicians spending between 30-50% of their time doing unplanned work. One seasoned technician actually checks e-mail to find out what's going to affect his schedule the next day. While this may appear attentive, it shouldn't have to happen. Without an increased level of proactive maintenance, costs will always be higher than necessary.

b. **Contractor Control** – There appears to be challenges when planning contract work on capital projects. It was reported that contracted construction work is often not defined clearly enough up front resulting in increased project costs and delays in returning equipment to service. An example cited was the coordination of work whereby a dig is started in November when the equipment has already been out of services for several months prior. This may be a contributing to general feeling that contractors are managing Union Gas vs. Union Gas managing its contractors.

c. **Inventory Issues to Work Orders** – There is a lack of recording issued spare parts to the related work order. This contributes to incomplete life cycle cost records (equipment history). It also prevents maintenance from feeding good spare part performance information back to engineering and purchasing resulting in the wrong parts being specified /ordered. This again results in higher than necessary costs for the assets.

d. **Recordkeeping** – There is a lack of complete master data (e.g. asset registry, asset classifications, BOMs, work history) in any of the systems in STO. This creates significant challenges for STO's ability to move from a reactive maintenance organization to proactive and take full advantage of a formal asset management strategy at Union Gas. It also results in higher than necessary life cycle costs for the asset.

e. **Reporting** – With asset data being fragmented between various systems or not even recorded at all, the reporting is incomplete and inaccurate. Without good data and history to support KPIs (Key Performance Indicators) it is impossible to manage any of the asset-related business functions cost-effectively. For

example, data on breakdowns is often not being captured at Dawn. Consequently, it's difficult to do the appropriate root-cause analysis and determine which equipment / materials are the "bad actors" and why. Lack of good data capture and the ability to report on it appears to be a systemic issue at Union Gas (e.g. DistOps challenges capturing leak history, easy access to maintenance history on a particular valve).

f. **Staffing Levels** – There is not sufficient tracking of the various types of maintenance activities to know if the staffing levels are correct and will support an asset management strategy. There should at least be projections in three areas:

- Preventive maintenance workload
- Planned workload
- Percentage of reactive work (weekly)

Without this minimum information, it is difficult to determine the correct staffing at Dawn. However, based on the visual indicators, the site interviews, and the survey data, there likely needs to be some upward adjustment in staffing. For example, there are hundreds of valves across the Dawn facility. Dawn used to have dedicated & experienced yard crews for valve maintenance but this was reportedly scaled back for budgetary reasons. Also, hundreds of thousands of capital dollars have been spent on new equipment at Dawn in the last few years. However, the increase in resources has not kept up with increase in assets. Vesta believes that the current staffing levels if left unchecked (at Dawn in particular) will continue to put a stress on STO's ability get out of its reactive or fire-fighting maintenance mode. This will clearly need to be addressed if Union Gas's asset management strategy is to succeed and be sustainable.

## 3. Aging Workforce

Union Gas has to factor an aging work force into its asset strategy. This finding is not unique to Union Gas and is more of an overall challenge that most capital-intensive companies have to consider in their strategies. The demographics show that as the "Baby-Boomer" generation retires, there are insufficient "Generation X" workers to replace them, particularly since fewer are choosing to enter the technical trades. This issue is being felt at Union Gas and will continue to deteriorate. This translates into senior employees retiring, creating a skills deficiency in the organization, and taking critical asset knowledge with them (which in turn exacerbates the issues of reactive work and lower productivity). With a shrinking labour pool to draw from, the lack of skilled technicians will ultimately have a negative impact on the performance of the assets.

## 4. Need for Integrated Systems

There is a tremendous amount of asset-centric data collected by Union Gas which is of value to most functional departments. The challenge is it's difficult to get at it. The

data exists in many forms (paper, spreadsheets, emails, databases, knowledge, etc) and resides in several highly-customized, siloed systems at Union Gas. Unless these systems are further integrated or replaced by an integrated *enterprise* system, Union Gas will always be challenged to get the right data to the right person at the right time. And Union Gas will never have the holistic view of its data that is required for effective asset management and life cycle costing. Contributing to this issue is the fact that many of these point-solutions are on outdated technology making it difficult for Union Gas's Information Technology (IT) group to be flexible and responsive to evolving needs of the business.

## 5. Better Data to Make Better Decisions is Desperately Needed

The ability to capture accurate and properly structured asset-centric data is clearly linked and largely dependent on Union Gas's ability to address the other findings called out in this report. Even with integrated systems in place, without the proper discipline and work processes, users of asset data may still not get the data they need. Addressing this challenge is fundamental to the success of any asset management program. The following are some examples of the data deficiencies being experienced at Union Gas:

- Both STO and DistOps don't have the data to determine how often a particular valve was repaired or why it needs repairing (e.g. "We have a bunch of crummy 'got a good deal' valves out there yet I can't drill down to why a failure is happening").
- All work at Dawn is charged at the 'Plant-level' which will always hinder Union Gas's ability to do cost analysis against a particular asset.
- There is too much manual involvement and tribal knowledge to make a determination if a section of distribution pipe should be replaced. Having the data to support the decision and also to make this more predictable would be a major benefit.

Part of the move to an asset management strategy will require proper focus and well documented work processes on what information is important and who should capture the needed data.

## 6. Union Gas is Heavily Dependent on Contractors

As with most large gas companies, Union Gas is heavily dependent on contractors to perform the work. At Union Gas, Aecon and Link Line are the go-to partners for most construction work. A successful asset management strategy will clearly require the contractor's full cooperation and adoption. This finding is not to suggest less reliance on contractors but rather to ensure that any work that contractors do as it relates to adherence to asset management policies, asset information handover, systems integration, and scheduling of resources, is taken into consideration when developing the asset management strategy.

## 7. Need for Scheduling Applications

There is a strong need for better scheduling applications particularly in STO and Construction & Growth. The CARS application for example has no real scheduling capability which makes it difficult to run an efficient and cost effective construction phase of an asset's lifecycle.

We have also highlighted the need for improved systems in STO and want to highlight that a properly configured scheduling tool will be key to the success of STO's maintenance work process (e.g. improving worker productivity, reducing reactive work, improved coordination of activities across functional departments).

The overall scheduling needs for the company will require more study and a well defined set of business requirements will need to be part of the improvement strategy.

## Summary of Recommendations

### 1. Improve Communications by Starting With Improving Documentation

Our experience in how to find success in this area starts with good documentation. We recognize the Union Gas has developed fairly extensive work process flows in the departments that we were introduced to. However, we believe Union Gas needs to further refine its work process flows to include key touch points and make sure that cross-functional impacts are fully fleshed out. It is important to take the time out of the field to map out the work process linkages / handoffs and look for areas to improve communication.

Another important step is often the development of RACI charts to clearly identify the lines of communication that are required to support an asset management process at Union Gas. These charts define who is Responsible, Accountable, Consulted and Informed for a given process or activity. Once the RACI charts are developed, business processes need to be mapped to the charts to ensure the proper data is provided to the proper departments / individuals to support asset management. These processes will require close monitoring in order to properly institute and sustain them.

It is recommended that these steps be taken in advance of implementing SAP EAM as they will be important inputs to the Blueprint (or design) phase of the SAP EAM implementation at Union Gas.

It should also be noted that as part of its SAP EAM implementation (and to assist with Change Management) it will be critical to document the linkages between its business processes and how they are manifested in SAP EAM.

### 2. Conduct a Rapid Business Process Blueprint for STO

Vesta recommends a renewed focus in the maintenance work process areas of STO. We believe that in order to move STO (and Dawn in particular) from a highly reactive maintenance culture to a proactive maintenance culture (a necessity for a successful asset management program), a rapid business process blueprint should be conducted. The blueprint would consider the following:

- **Maintenance Goals and Objectives**
  This part of the blueprint will examine the expectations of the maintenance organization to ensure alignment of goals. It will also identify the business processes that need to be mapped to outline the maintenance function.
- **Preventive Maintenance**
  This part of the blueprint will examine the current state of the preventive maintenance program and improvement necessary to support the asset management strategy.
- **Planning and Scheduling**

This part of the blueprint will develop a plan for implementing effective planning and scheduling processes.

- **Contractor Utilization**
  This part of the blueprint will examine current contractor utilization and develop a plan to improve this process.
- **Inventory Issues to Work Orders**
  This part of the blueprint will develop an inventory tracking process, which will include everything from ordering to fulfillment.
- **Reporting – KPI Development**
  This part of the blueprint will detail the KPI's and reporting necessary to monitor the maintenance business at STO.

The outcome from this rapid Business Process Blueprint will be an actionable plan that enables the maintenance organization to prepare for, and properly support, an asset management strategy.

It is recommended that these steps be taken in advance of implementing SAP EAM as they will be important inputs to the Blueprint (or design) phase of the SAP EAM implementation at Union Gas.

## 3. Capture Critical Knowledge Now

As previously mentioned, this is an overall problem for maintenance and reliability functions in most companies. The key action here is to develop procedures, tools and clear strategies to capture the knowledge that experienced staff have before they retire.

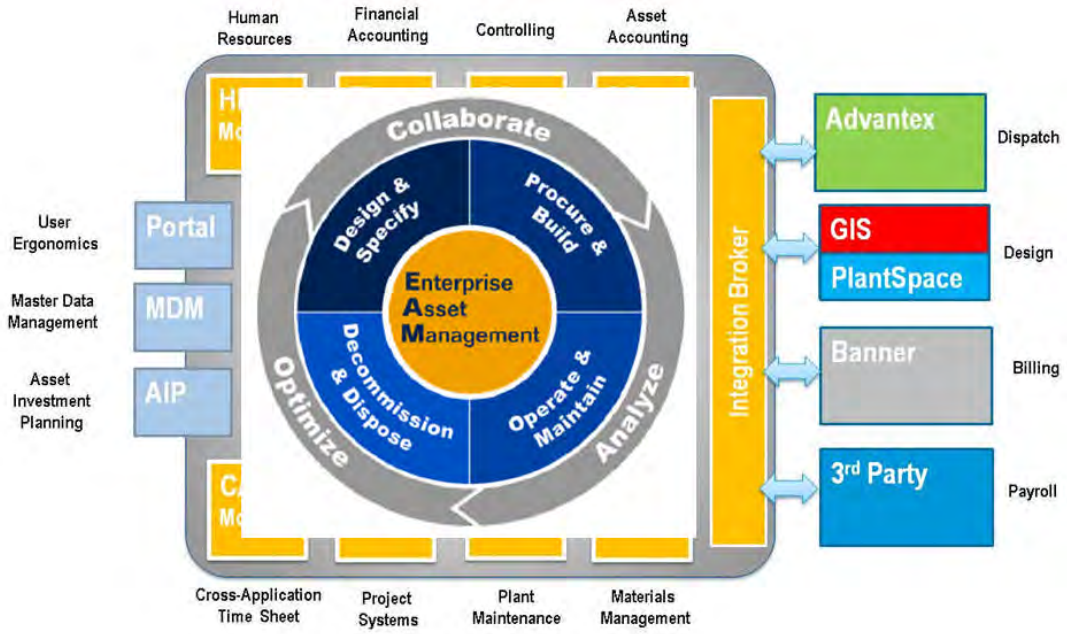
A first step is to develop a detailed duty-task-needs analysis for the maintenance and operations departments. If this information exists in the proper level of detail, then it should be utilized to develop a skills matrix for each of the maintenance and operational positions. This skills matrix can then be utilized to determine the gap between current employees, potential employees and the job skill requirements. This provides the data necessary to specify / develop a training program to ensure workforce efficiency and also help with succession planning. The new mechanic, technician, or operator will seldom take a "brain dump" from the person with 30+ years of experience. The key is to have the analysis pick the actual skills that are vital to perform the actual job functions. This analysis will also be useful in matching the right resource(s) when planning and scheduling work.

Seasoned technicians will often repair equipment or conduct preventive maintenance simply based on their knowledge of the asset. New technicians on the other hand will need detailed step-by-step procedures, drawings, and other guidance. A focused effort is needed to capture the critical knowledge of the retiring work force and get it into a centralized repository where it can be leveraged by other systems and people.

## 4. Need for Integrated Systems

This recommendation revolves around the implementation of SAP as the strategic platform for EAM at Union Gas. SAP should be able to replace a number of existing home grown applications at Union Gas. The development of a common asset registry (residing in SAP EAM) is critical to the success of Union Gas's asset management strategy and can act as a platform to provide integration even to other specialty systems.

As part of the documentation provided, we are aware that Union Gas funded a detailed technology assessment in 2010 with CGI Consulting. The following graphic was included in their final presentation:




We agree that this concept of SAP as the EAM foundation with key interfaces to the other systems is a key part of the strategy. We get into much more detail of key items to consider and the value to this approach but having a robust system platform will be a key to success.

## 5. Improved data for decision making

The recommendations here are tightly integrated with any system changes since systems and data clearly go hand in hand. We call it out separately since a good system on its own does not solve the data issues. KPIs, regulatory reporting requirements, performance measures, as well as the correct business processes and the discipline to follow them are all part and parcel of capturing the right data. We highlight below some of the basics that need to be done properly in order to better support the reporting and analytical needs of STO and DistOps:

- Inventory *critical* assets. Although we did not examine Union Gas's systems, it is our understanding that the GIS, Mapcon, Banner, and MISOS are the "official" asset registries at Union Gas. It is imperative that these systems contain an up-to-date and complete inventory of the critical assets at Union Gas. It is crucial that the physical asset and the digital asset are the same (e.g. make, model, serial, geographic location).
- Group and classify assets. Classifying assets and their parent-child relationships is foundational for efficient & effective work management practices, inventory management, and asset life cycle costing (to name just a few).
- A well developed approach to managing non-structured data such as PDF's, spec sheets and other asset-related documentation is key. With the planned implementation of SAP the approach to linking documentation to assets should be considered in order to avoid Technicians from having to "hunt" for information.
- Define and implement a data governance strategy. Building the data foundation is one thing. The other half of the battle is sustaining the quality of data so that users continue to have confidence in it (and therefore don't end up circumventing defined work processes). It is important to clearly define who should input data, who can change it, and ensuring it is auditable.

It is highly recommended that these steps be taken in advance of implementing SAP EAM as they are fundamental to end user adoption of the system and the processes it enables.

### 6. Improve Integration With Contractors

This area will need more study but needs to be factored into any potential system changes. Contractors are a key part of the success of getting work accomplished at Union Gas. The key recommendation here is to try to prevent re-entry of data where ever possible by more closely integrating Aecon and Link Line work management system with Union Gas or better yet, have the contractors using a contractor portal that sits atop SAP. With the changes in software and the move to a service-oriented architecture, the ability to gather data by the most efficient point-of-entry can have great potential for savings and efficiency. It will also provide Union Gas with better data to more closely monitor contractor service levels, work completed, and improve reporting.

### 7. Implement More Robust Scheduling Applications

Properly scheduled work is important in order to have the lowest possible cost of projects and maintenance work. Union Gas will need to evaluate various scheduling application provided by SAP and their partners as one size does not fit all. There are tools that are already standard with SAP ECC (e.g. planning board) and several excellent scheduling applications that are tightly integrated with SAP. The scheduling application used will likely vary by the area of the business (i.e. STO vs. DistOps). Although they may use a common enterprise system like SAP, there is certainly a

difference of approach to scheduling a large capital project vs. a weekly work plan for inspections or maintenance.

A key application being provided by SAP today is MRS – Multi Resource Scheduling. This scheduling application is being successfully used by many customers for scheduling maintenance work. It can also be used to schedule construction type work but many customers find it most effective to use applications like Primavera or MS-Project to improve the interface to contractors. The team will need to develop its list of requirements in order to make a clear determination. In order for Union Gas to realize the value of good planning, robust scheduling applications will need to be a key part of the its asset management strategy.

Beyond actual work scheduling, Union Gas should also consider the implementation of PPM or Project and Portfolio Management from SAP. This application can help with the overall project integration and long range planning for capital investments. Further study and investigation is needed to assess its real value to Union Gas but this application should certainly be reviewed as part of getting ready for SAP EAM.

Vesta Partners sincerely thanks all the individuals from Union Gas who participated in the on-site interviews. We appreciated the open dialogue and willingness to share information and found a general desire to improve maintenance & reliability practices at Union Gas, and a strong interest to adopt an asset management strategy. Additionally, we wish to extend a special thank you to the core asset management project team including Michelle George and Mike Lindley for their sponsorship and support while on site.

# Introduction to Asset Management

## Defining the Term Asset Management

The term "Asset Management" can mean different things to different companies, departments, and people. The Canadian Gas Association's Guiding Document on Asset Management provides the following definition of Asset Management. This definition is also aligned with Union Gas's Operations Management System (OMS) Element 4:

> "Asset management is a strategic management system used to optimally manage assets over their life cycle by balancing performance, risk, and expenditures to achieve corporate strategic objectives."

To be clear, what asset management is *not* is a maintenance management system, a financial system, something mandated by a regulatory body, or an automated process.

The on-site interviews conducted by Vesta revealed some interesting and varied ideas of what Asset Management is. Some examples are found below:

- "Management of your equipment through the lifecycle …from construction to commissioning to retirement."
- "Management of your equipment with proactive, preventive maintenance flair."
- "You understand from an accounting perspective, the lifecycle. And retire it at an appropriate age."
- "Asset Management is all the pipelines, all the storage. Not individual pieces of equipment."
- "A system to manage, see every leak, see five leaks on a main."
- "Something that tracks whether you've been there several times."
- "Something that can help justify replacements and the budget dollars."
- "Making sure we're planning efficiently."
- "A safety deposit box to protect our assets."
- "It's the productivity of the assets and the capability to be productive in our people."
- "Maximizing the value of what we have – people, vehicles, pipelines, etc."
- "Using what we have but working smarter, not harder."
- "It's the financial management piece of it."
- "How to design, install, and maintain those assets. And from that have good strong financials, etc."
- "Channel information into one repository and look holistically vs. pulling it from other areas piecemeal."

- "All the systems are integrated…one stop shopping."
- "Look and feel [of the systems] is the same."
- "Cradle to grave record of what's happened, trending, where all the inspections are, stuff all in one place, [and is] query able."

Whichever definition of asset management Union Gas settles on, each line of business, department and employee will need to have a clear understanding of what it means to Union Gas, and what it means to them personally in their own job function.

## Defining the Term Asset Management Strategy

An "Asset Management Strategy" can be defined as a comprehensive and strategic set of concepts, techniques, and tools that, when adopted and used effectively, can enhance a company's current management of its assets.

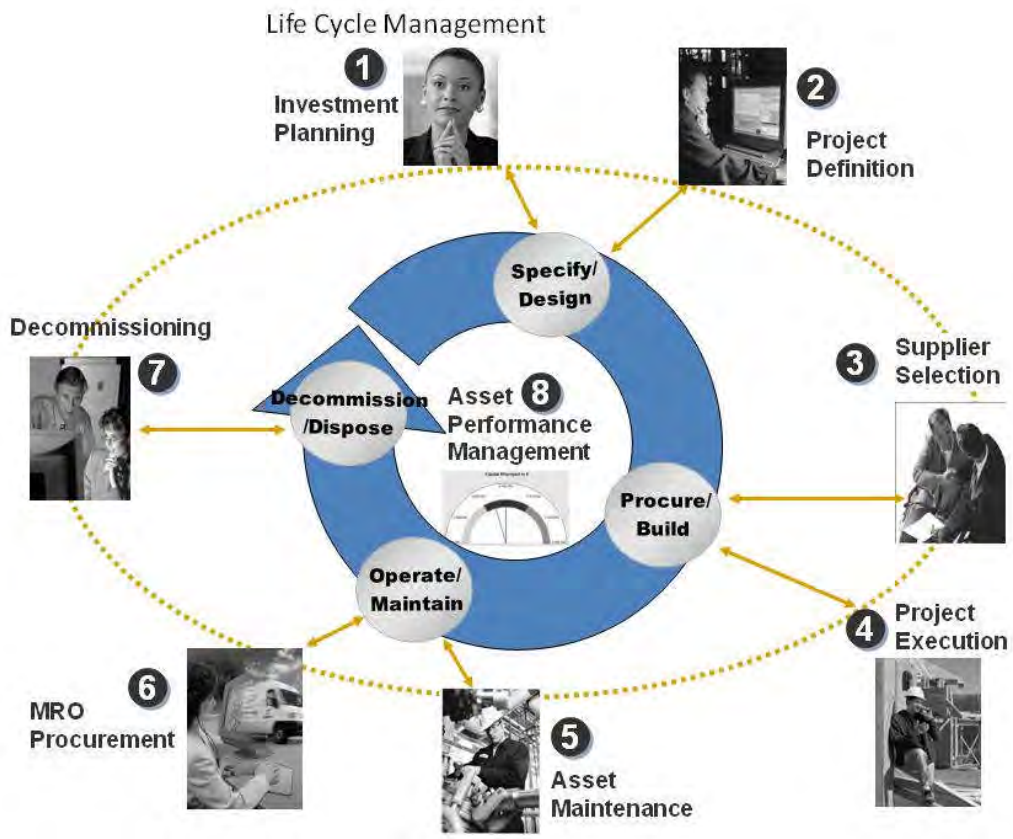
There are various efforts around the globe to develop asset management standards and guidelines. The Canadian Gas Association (CGA) guideline document is an example of this and the one that Union Gas currently endorses. There is also the PAS-55 asset management standard from the UK as well as an international effort to develop an ISO standard for asset management (ISO-55000).

If any standard is to receive wide acceptance at Union Gas, it will have to have a positive impact on the overall business and be aligned with Union Gas's strategic goals. If not, then it will be a standard that some can point to, but senior management will not be too concerned about compliance.

## Asset Life Cycle Management

The investment in assets is about maximizing their lifetime value for the benefit of Union Gas and for its Customers; and that is a major reason why an asset management strategy is going to be important to Union Gas.

The following section should be viewed as a necessary primer on the subject of Asset Life Cycle Management. Asset life cycle management is a key tenet of any organization's asset management strategy and defines the dependencies between the major stakeholders and key sources of data for efficient and effective maintenance & reliability (refer to the following diagram).




## 1. Investment Planning (Needs and Feasibility Assessments for Assets)

This phase of an asset's life cycle begins with the discovery that there is a new product or service that can be produced and sold or there is a greater demand for it. In the case of Union Gas, it might be a new sub-division being constructed, adding a new turbine at Dawn, or the expansion of existing storage capacity. The demand for new assets may also relate to meeting increased regulatory requirements for existing assets. This may involve:

a. Strategic Planning

   i. The company direction is to diversify or expand, moving into new markets or expanding geographically

   ii. The company direction is to expand their share of an existing market

b. Customer Needs

   i. The customer demands modifications or enhancements to existing products or services that requires new assets (e.g. a new subdivision)

c. Regulatory Requirements

i. There may be new regulatory requirements that require extensive modifications to existing assets, or acquisitions of new assets

## 2. Project Definition, Including Proper Configuration of Assets

In this phase of an asset's life cycle, the scope of the asset(s) is defined. For the asset to meet the demand (identified in phase 1), it will need to meet certain reliability, maintainability, projected life, and total cost of ownership (TCO) requirements that all assets will need to meet to support the business requirements. For example, what size of compressor is going to be required? Does it need to be one large compressor or can it be modularized and upgraded when the capacity demand increases?

Assets will also have certain design reliability, maintainability, projected life and TCO requirements will need to be met in order for it to support the business requirements identified. What is the volume that must be achieved to meet the business need identified in phase 1? Will the assets be required to perform in 7 X 24 operations or will it be a 5 x 24 schedule? The reliability (how long the equipment operates in between maintenance periods) and maintainability (how long it takes to restore the equipment to service) is critical to the decision on the capacity of the asset and the profitability (ROCE) of the new product or service.

This leads to the cost- benefit analysis. When considering production assets, if the assets need to produce 1000 CFM, will the company design (or purchase) a compressor rated at 10,000 CFM? Or will it design (or purchase) a compressor rated at 500 CFM? Any mistakes in designing assets, where the design is not based on the company's long range strategic plan will result in financial consequences for the company.

It must be kept in mind that the asset, at this phase of its life cycle, is still only a document, a drawing, or a blueprint. There have been no major costs (other than studies) done to this point. In fact, up to 90% of the life cycle costs are specified (knowingly and unknowingly) by the asset design engineer. However, the same 90% of the assets life cycle costs are not incurred until the asset is in its operational and maintenance phase of the life cycle.

## 3. Construction, Acquisition or Enhancement of Assets

In this phase of an asset's life cycle, it is created, produced, or acquired. The initial construction/ acquisition cost is actually incurred at this time. If the asset is constructed internally, all of the design documents, capacity studies, reliability and maintenance specifications, regulatory requirements, etc. are utilized to construct an asset that will provide the company with the maximum ROCE.

If the asset is to be purchased, all of the same design documents, capacity studies, reliability and maintainability specifications, regulatory requirements, etc. are provided to the vendor who will be constructing/ providing the new asset (in Union Gas's case,

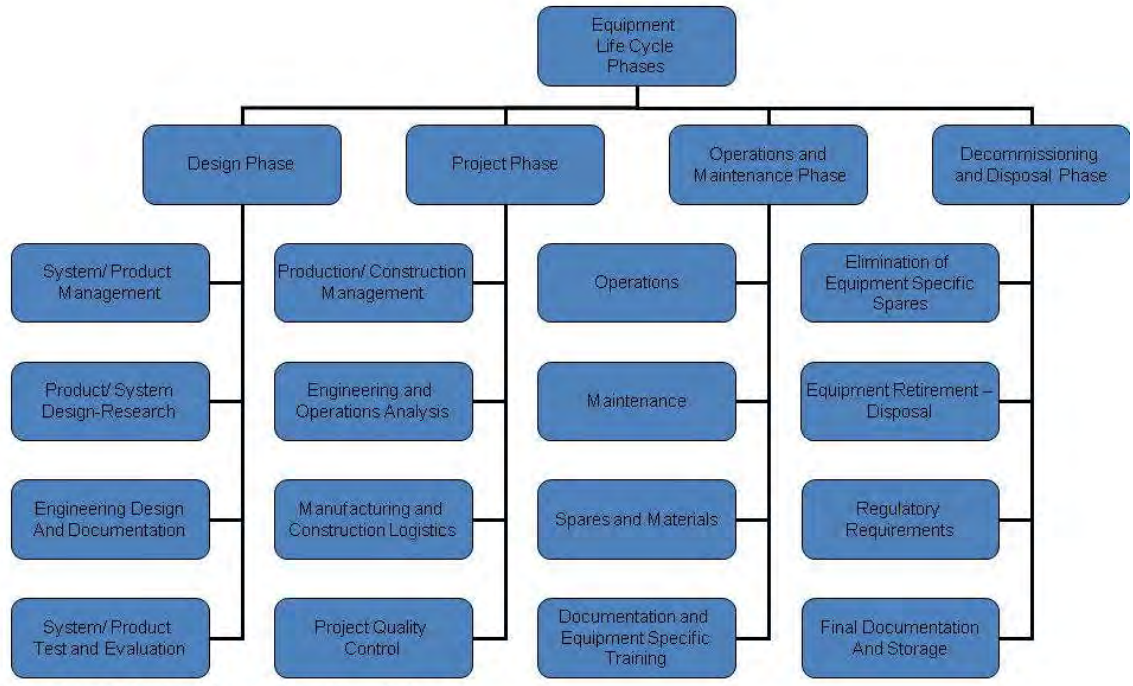
this is typically Aecon and Link Line). The company will audit the delivered asset against the specifications to ensure the proper asset has been supplied by the vendor.

If existing assets are to be redesigned/ modified to meet the business plan, then all of the same specifications that would have been developed for a new asset (whether constructed internally or purchased externally) are used during the modification of the existing asset. At the end of the redesign or modification, the asset should be capable of delivering its design capacity at the specified cost.

## 4. Project Execution of Assets

In this phase of the asset's life cycle, the asset, whether it's built, purchased, or retrofitted, it is installed in the plant or in the field. This phase is actually a construction or installation project.

This following diagram rolls the construction, acquisition, and installation of the asset into one phase. This phase is critical, since poor installation/ construction practices can diminish the design reliability and maintainability of the asset. For example, poor foundations under equipment can make it virtually impossible to achieve its reliability and maintainability design specifications.




*Based on Life-Cycle Cost And Economic Analysis –*
*Benjamin S. Blanchard*
*(Professor of Engineering-Emeritus*
*at Virginia Polytechnic Institute and State University)*

During this project phase, commissioning also occurs. In an equipment setting, all of the asset's capacities are tested to ensure they meet the design specifications.

Once the commissioning component is achieved, the asset ownership now passes (i.e. is handed over) from the external supplier or internal engineering group to the Operations & Maintenance organization. All documents, manuals, drawings, etc. are transferred to the company, which needs to then be stored in a corporate document management system (DMS) and master data loaded into the maintenance management system (e.g. SAP). It was noted that there have been cases where equipment has been commissioned at Union Gas and the data is still not properly entered into the maintenance management system. Getting the master data and documents properly organized in SAP before start-up is paramount. Not doing this properly and in a timely fashion will have lasting financial, safety and reliability consequences over the life of the asset.

## 5. Operations and Maintenance Phase of Asset Life Cycle

This phase is where the asset actually starts providing the business service or production that it was envisioned to provide back in the first phase of its life cycle. It is much more than pushing a button to open a valve or start a compressor. It is insuring that it delivers the design specifications. There are two aspects to this – Operations and Maintenance.

From an operations perspective, does the equipment achieve the design capacity? Does it provide the flow and pressure at the rate which the original design specified? Does the asset meet the "operability" that was specified in the initial design documentation?

From a maintenance perspective, the asset was designed with certain reliability and maintainability parameters. Does the equipment achieve the design Mean Time Between Failures (reliability) and the design Mean Time To Repair (maintainability)? If not, why not? Do the specified maintenance policies and procedures ensure that the design specifications can be achieved? If not, why not? It was mentioned previously that up to 90% of the assets life cycle cost will be incurred during this phase of the asset's life. These costs are commonly divided into labour costs, materials costs, and contractor costs.

In this phase of the life cycle, information management is critical. Tracking all of the data in the maintenance management system ensures that the proper level of maintenance activities are being performed on the assets to ensure they deliver their design functions at the designed costs. This data is essential in a later phase of the life cycle if any business improvements related to the assets are to be achieved.

## 6. Rehabilitation or Retrofitting of Assets

The activities surrounding shutdowns, turnarounds, and outages are focused on restoring deteriorated assets to an acceptable base line to ensure that the original

design capacities can be achieved. Dawn has large windows of this life cycle phase when it has light demand in the warmer spring and summer months. There was also the example of the Parkway Compressor Station being rebuilt in 2006 and the Bright compressor station being rebuilt in 2008.

## 7. Decommissioning, Retirement, and/or Disposal of Assets

In this phase of an asset's life cycle, it is time to decommission and dispose of it. In some cases decommissioning is nothing more than writing it off the books and gradually selling off components of the process. In some cases, when a process is decommissioned, it is "cannibalized" for similar parts for other assets that are still operating somewhere else in the plant or facility. When this occurs for a time period, the remaining components will eventually be sold off for scrap (as is the case with Plant 'A' at Dawn).

## 8. Performance Management

This aspect of an assets life cycle is often overlooked; performance management is critical throughout the life of the asset. While there are many different aspects of performance management, if a company does not measure the performance of an asset, it cannot be improved in the next generation of asset evolution.

For example, each company asset was originally conceived and designed to perform a task in the plant or in the field. Some performance measures must audit the installed and operating asset against what it was conceived and designed to perform. Whether it was a building that was supposed to house 500 people for 8 hours a day for 5 days a week for 40 years or a compressor that was supposed to provide 1000 CFM of flow for 24 hours per day, 7 days a week, for 15 years, the question must be asked "did it achieve that level of design performance?"

If it did, then the performance was satisfactory. If it did not, then why not. This is where a typical maintenance management system is used to monitor performance. A typical system will track the mean time to failure (MTBF) and the mean time to repair (MTTR). It tracks the labour and material costs (whether internal, contractors, or a combination) that the asset required to keep it at design performance.

After this information has been tracked through the life cycle, it should be fed back into the "conceive" and "design" phases of the next generation of assets for the company (it is our understanding that this is an area where Union Gas would like to improve and presents an opportunity to draw a stronger link between O&M and the capital side of Union Gas). Any weaknesses in the prior assets are corrected in the new design or specification for the next generation of assets.

# Asset Management System – Distinguishing Elements

For every asset management system, there are certain business practices (or elements) that, when utilized, enhance the effectiveness of the system. While these exact business practices vary from industry to industry, there are some that will specifically apply to Union Gas. These practices and their current state in Union Gas will be examined in this section.

## Asset Criticality, Asset Baselines, & Asset Health Review

In the development of any asset management system, it is necessary to clearly understand the current business conditions, the strategic direction the company is taking to capitalize on business opportunities, and the gap between the abilities of its current asset base to meet the identified market demands. This allows for the clear identification of capital requirements for new assets or major redesign/ refurbishment of existing assets. While it was beyond the scope of the site visit to understand the specifics of Union Gas' strategic business plan, there were certain distinguishing elements that were reviewed.

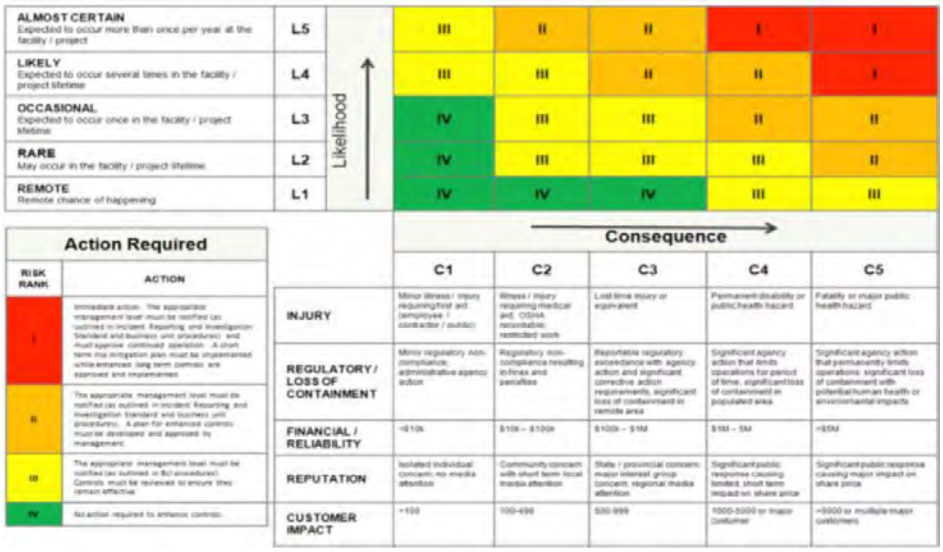
If an asset management strategy is to be comprehensive and complete, then all of Union Gas's assets need to be clearly identified. This usually involves the task of developing a complete inventory of all production assets. Once the assets are identified, then present condition should be base lined. For example, are the assets in prime condition, ready to perform at their design capacity and reliability? Or do the assets need minor (or even major) maintenance activities to restore them to their design capacity and reliability.

Once the asset's base condition is established, then they should be grouped into classifications based on their types. For example, at Union Gas, how many emergency valves are there? Where are they located? How many air compressors are there? Where are they located? This listing is important since the next step involves determining the criticality of the assets and the level of service that they must provide. This step is important since, under most of the asset management standards, a company may certify all or only a part of their assets, based on their criticality to the business. For example, the primary equipment in a process may be certified to the standard, where backup or redundant systems do not need to be certified, since they would not significantly impact the business.

Regardless of the approach taken (all or part of the assets) the documentation for tracking the life cycle costs must be developed and properly maintained. This task falls mainly to the maintenance department and its optimum usage of the EAM system.

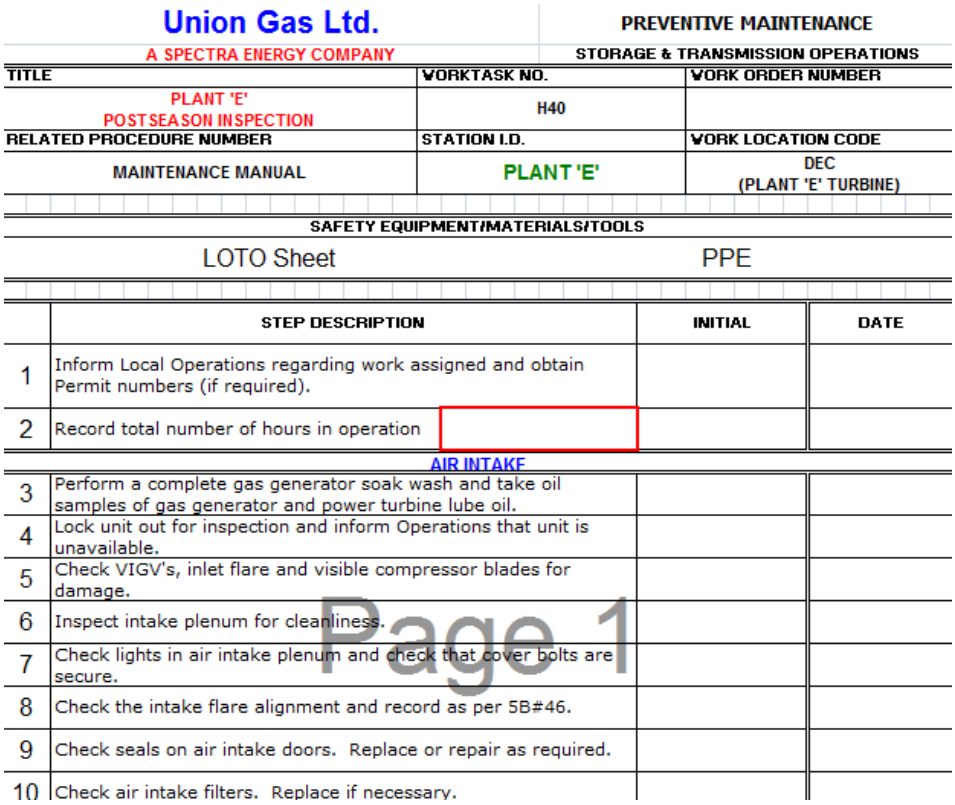
Union Gas's maintenance business function plays a large role in mitigating the risk related to asset operations be it through preventive maintenance inspections at STO or corrosion inspections in DistOps. The asset must perform to its design criteria consistently throughout its life. Unless it is properly maintained, it is impossible to achieve this level of performance. An organization cannot spend capital dollars to compensate for poor maintenance on its existing asset base. This is why many organizations today monitor their maintenance expenditures based on the value of their asset base. This is commonly referred to as the maintenance expenditures compared to the estimated replacement value indicator. This ensures that companies are properly balanced between their capital expenses and maintenance expense.

It was clear that Union Gas understands their business risk as it relates to their assets. For example, there was a clearly well developed process for risk assessment around EHS (Environmental Health & Safety) which is in turn helping to drive Engineering's priorities. The end result of the risk assessment is a risk registry. A sample is pictured in the following diagram.




This demonstrates that Union Gas has experience with this asset management system distinguishing element. The tool is also used to categorize capital projects on all risk-based replacement projects. Wider adoption of this type of tool across Union Gas is recommended.

Another distinguishing element is the asset baseline and asset health review. The baseline and health review are typically operations and maintenance inspections and utilization reviews. These reviews are then used to determine what activities need to be implemented to keep the assets in an acceptable baseline condition to deliver their design functions and performance. In the maintenance organization, one key function that impacts this distinguishing element is the preventive maintenance program. As evidenced by one document that was provided to the Vesta team (Post Season Inspections – Plant E Document referenced below), it appears that STO has a preventive maintenance program in place.



**Union Gas Ltd.** — PREVENTIVE MAINTENANCE
A SPECTRA ENERGY COMPANY — STORAGE & TRANSMISSION OPERATIONS

| TITLE | WORKTASK NO. | WORK ORDER NUMBER |
|---|---|---|
| PLANT 'E' POST SEASON INSPECTION | H40 | |
| **RELATED PROCEDURE NUMBER** | **STATION I.D.** | **WORK LOCATION CODE** |
| MAINTENANCE MANUAL | PLANT 'E' | DEC (PLANT 'E' TURBINE) |

**SAFETY EQUIPMENT/MATERIALS/TOOLS**

LOTO Sheet — PPE

| | STEP DESCRIPTION | INITIAL | DATE |
|---|---|---|---|
| 1 | Inform Local Operations regarding work assigned and obtain Permit numbers (if required). | | |
| 2 | Record total number of hours in operation | | |
| | AIR INTAKE | | |
| 3 | Perform a complete gas generator soak wash and take oil samples of gas generator and power turbine lube oil. | | |
| 4 | Lock unit out for inspection and inform Operations that unit is unavailable. | | |
| 5 | Check VIGV's, inlet flare and visible compressor blades for damage. | | |
| 6 | Inspect intake plenum for cleanliness. | | |
| 7 | Check lights in air intake plenum and check that cover bolts are secure. | | |
| 8 | Check the intake flare alignment and record as per 5B#46. | | |
| 9 | Check seals on air intake doors. Replace or repair as required. | | |
| 10 | Check air intake filters. Replace if necessary. | | |



While this document is in an Excel spread sheet, it would be more beneficial to the STO organization if they would make more use of the Mapcon system for this level of detail to better support reporting and analysis. When there is a changeover to SAP EAM, it is recommended that these documents be converted into job plans in SAP to drive efficiencies in planning and executing preventive maintenance.

## Life Cycle Costing

As mentioned previously, the majority of the life cycle costs are determined in the design phase of an asset. However, up to 90% of the life cycle costs are not incurred until the operations and maintenance phase. It is with this thought in mind that the following section will examine some of the elements of an asset management system as they relate to the maintenance and operations phase of an asset's life cycle.

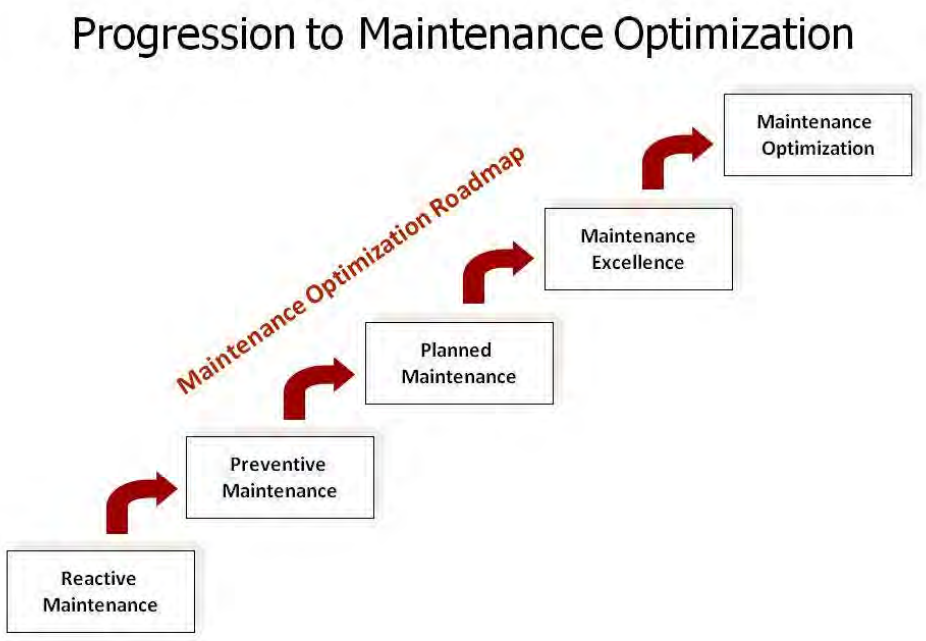
The key finding here is due to lack of a common asset registry and many disconnected systems, it is difficult today to get a complete assets cost through its lifecycle. SAP will be a great accelerator here but again the system will not be a silver bullet here. It is important that UG see value to looking at the cost for a full lifecycle.

One area that SAP can offer much value is linking the equipment or maintenance assets to the fixed asset record. As pointed out in the Canadian Gas guiding document is that it is important to keep a link in costing between the depreciation records for an asset and the maintenance cost that are incurred in the maintenance portion of the lifecycle.

Getting a proper handle on lifecycle cost for key pieces of equipment can certainly offer great value in determining the economic life of the asset. This will become an opportunity down the road and should be factored into the strategy but not the first area of focus for Union Gas.

## Maintenance Optimization

The maintenance & operations phase of the assets life cycle is where the majority of the actual costs are incurred. This emphasizes the need to control all aspects of the maintenance activities. The progression of maintenance from the reactive phase to the optimization phase is highlighted in the diagram below.




While Union Gas has different levels of maintenance activities, it is clear that STO is closer to the reactive end of the spectrum. DistOps is further along the spectrum, but still has opportunities for improvement. For Union Gas to be successful in reaching the maintenance optimization phase, it will take a focused effort by all of the departments involved in the management of the assets to be successful.

# Asset Management System – Supporting Maintenance and Reliability Elements

## Policy, Objectives, and Planning

In this section, the overall attitude of the organization toward maintenance and asset management is examined. This starts with the endorsement of asset management strategies and policies by senior management at Union Gas. Currently, Union Gas has this level of endorsement with Mike Shannon (VP, Engineering Construction & STO) sponsoring the initial development of an asset management strategy. Senior management endorsement will be increasingly crucial as Union Gas moves the strategy from concept, to planning, and on to implementation and sustainment.

According to the benchmark survey, 67% of respondents rate management's support of improvement efforts at Union Gas as "good" while 20% rate management support as "poor". For many organizations, improvement efforts are started but most fail after a short time because they lose sponsorship to other priorities. An asset management strategy will need to become a formal program at Union Gas and be ingrained in its corporate culture from the top-floor to the shop-floor / the field. Executive sponsorship will be critical to sustainability. Also, the development of key performance metrics and their inclusion in Union Gas's scorecards program will also help with adoption and compliance of its asset management processes and procedures.

## Document and Records Management

In the asset management discipline, numerous documents must be managed during the life of the equipment. The documents range from equipment manuals when it is initially purchased, to the disposal certification documents when the equipment is decommissioned. As the equipment progresses through the maintenance & operations phase of its life cycle, there are modifications and retrofits that must be documented and necessary revisions made to drawings, manuals, bills of material, job plans, etc. In addition, there are also regulatory documents that must be tracked for certain equipment including Material Safety Data Sheets (MSDS) and Management of Change (MOC) documents.

According to the benchmark survey, roughly 77% of respondents have difficulty finding unstructured information in the document management system (DMS) at Union Gas (i.e. FileNet) or, have to go to a separate source to get the information they need. As one individual reported during interviews, "All my knowledge is in my email and they're starting to delete that!" If this practice is widespread at Union Gas, then much of the knowledge that should be held in auditable system such as FileNet is devolving into tribal knowledge. This will disappear as the aging workforce retires, leaving Union Gas with an information deficiency.

It should also be noted that when Union Gas eventually moves to SAP EAM, the integration between it and FileNet for example, will be an important consideration for reducing the amount

of time Technicians spend looking (hunting) for documents. All the more reason for Union Gas to investigate some of the feedback we received from the interviews and survey to ensure it is well positioned to take advantage of its corporate DMS under an asset management program. We would recommend at least considering document info records in SAP's DMS solution as a pointer to FileNet information.

## Training and Competency

Many organizations including Union Gas have aging workforces (the average age of a maintenance technician at STO is 50+) and will be retiring in the near future; taking critical equipment knowledge with them. On the other hand, the skills / equipment knowledge of those technicians *entering* the workforce needs to be at a level that allows them to safely and efficiently operate & maintain the equipment installed across Union Gas's landscape.

According to the benchmark survey, 88% of respondents (all from STO but one) claim there is no training program in place for planners and that a heavy dependence is placed on informal in-the-field training. This may be largely due to STO not having a separate planning function (which we believe to be a major bottleneck for STO to move to a proactive maintenance program). While in-field mentoring is useful, this type of approach provides diminishing returns over time, as the mentoring is typically provided by those technicians who will soon be retiring.

Representatives from Construction & Growth state that when a new Construction Supervisor or Project Manager joins Union Gas, there is no process or program in place to properly orient them. To complicate matters, it was also reported that proper succession planning is also inadequate.

## Performance Evaluation & Audit

DistOps and Engineering have instituted scorecards to help assess performance and are tied to compensation (although curiously Construction & Growth noted that there is a lack of scorecard KPIs). With respect to STO, we recommend STO incorporates more maintenance KPIs into their current scorecard program. Additionally, a more disciplined approach as to the use of work orders and the capture of key data will be necessary in order for STO to realize the value of using scorecards.

## Communication

Effective communication within and across groups at Union Gas is critical to the management of its assets as well as the success of a formal asset management strategy. It will be imperative for each department to clearly understand its role and objectives in delivering upon Union Gas's asset management policies and practices and the linkages / dependencies they have with other groups. We refer back to the previous section of Asset Life Cycle Management to highlight some of these drivers and interdependencies.

In order for effective communication to take place, asset management policies, standards and procedures will need to be clearly defined and communicated (and adhered to) throughout Union Gas - both internally and externally. It will be imperative that people not only understand their role in delivering upon an asset management strategy, but more importantly they understand why it is important to Union Gas and its corporate strategy (i.e. how do I make a difference).

It was reported that 41% of survey respondents felt that asset-focused communication between Operations, Maintenance, and Engineering takes place occasionally, seldom, or never. The lack of collaboration between Operations and Engineering during the planning stages of a capital project, blurred lines of responsibility between Operations and Maintenance. At Dawn, poor asset information hand-over to Operations and Maintenance on capital projects, and the lack of alignment in defining who is the "Customer" in C&G are indicators that communication breakdowns exist and need further investigation as to their root cause.

## Management of Change

Management of Change (MOC) policies and procedures are important to any asset focused organization. Unless it is clear what equipment is installed at what location, there is a risk someone could be injured while repairing or operating the equipment. An auditable MOC process helps to ensure that all equipment replacements, modifications, or disposals are properly tracked and recorded to ensure that the employees working around the equipment can be properly notified and protected. In addition, it is also important to help ensure that an improper change does not damage the asset itself. It was not clear based on the survey and the interviews that this level of data is being tracked at Union Gas. Given the lack of rigour in the handover of asset information on capital projects, as well as suggestions that "we change our practices but we don't document why we change the practice (e.g. skipping PM work)", Vesta believes that Union Gas needs to improve the level of governance in place to ensure proper MOC.

MOC touches almost every aspect of the asset life cycle and impacts asset costs, risk assessments, safety, and Union Gas's ability to reliably deliver product to the customer. We strongly encourage Union Gas to revisit its approach to MOC and assess the efficacy of the current program.

SAP will be a great advantage to Union Gas in the area of enabling MOC. Standard with SAP EAM is the ability to track changes or actions to most objects (master records and transactional data) including an auditable change log. There is configuration around what changes are important to track so that it can be customized to Union Gas's specific business needs. In addition SAP has stated that they are working on a cross-module application to help with overall MOC. It will be an application to package up an MOC request, route for approvals, and then be able to monitor the change. This application is not complete or released to the market yet. Vesta continues to stay in close touch with SAP on this and many other developments in SAP's roadmap for EAM.

# Implementation Considerations

## Organizational Structure

The Canadian Gas Association guide identifies three different organizational structures to support and sustain an asset management strategy: Functional, Geographic, and Asset-centric. In the short time that Vesta spent with Union Gas, we are not in a position at this time to make any sort of judgments or recommendations as to which structure (or a combination thereof) is most conducive to achieving a successful asset management program at Union Gas.

With that said, we do know that Union Gas needs to establish and maintain an organizational structure of roles, responsibilities, and authorities that is consistent with achieving *both* its asset management strategy and its corporate business objectives. This does not necessarily mean that a separate structure is needed or that the existing structure needs sweeping changes. As Union Gas continues to develop its asset management policies and procedures, it will become more apparent as to what tweaking is needed organizationally.

Below is a short list of key considerations to keep in mind regardless of the structure that is defined:

- Appoint a member of top management who will be responsible for the success of the overall asset management program
- Ensure the availability of sufficient resources to implement and sustain the strategy
- Communicate to all stakeholders the importance of complying with the strategy

During its assessment, Vesta detected some potential head winds that will contribute to defining and implementing an optimum organizational structure at Union Gas:

The benchmark survey revealed that 42% of respondents within the maintenance organization feel there are some gaps in job coverage while 31% felt that there are unclear lines of authority. Additionally, 31% of respondents reported that within the maintenance organization, there are frequent job delays, and frequent disagreements. Dawn for example is organized functionally but the work is done geographically. Consequently, there is a “battle” over who does what (e.g. overseeing a Contractor).

The implementation of a formal planner position within the STO organization is desperately needed. The addition of this position will help define the responsibilities of the supervisors, allowing them to supervise and allow the planner to focus on the planning function. For example, a benchmark supervisory ratio to hourly technicians is 1:8-12. So a first line supervisor should be able to properly manage 8 to 12 craft technicians. A ratio for planners to technicians is 1:15-20. Thus a rule of thumb is that one planner can plan for two crews of maintenance technicians. This in and of itself is critical to the success of any asset management strategy.

In this age of downsizing, organization and staffing are among the most critical issues affecting maintenance and engineering. While the topic of downsizing was not a main topic during the interview process, it was noted that additional assets have been added to Union Gas' portfolio without an comparative increase in maintenance resources. This added work has the same impact as if the organization had been downsized, in that there is more work for the same people to perform. It is necessary to review the craft workload in view of the number of assets that are being maintained. In this way, the organization can be "right-sized".

A maintenance and engineering work backlog is the amount of work currently identified as needing to be performed by the maintenance and engineering department. The Society for Maintenance and Reliability Professionals (SMRP) best practices group recommends that backlog be measured by hours of work to be performed. When calculating the backlog, it is necessary not only to know the hours of maintenance and engineering work needed, but also to understand current work force capacity. This is how all maintenance management programs are set up and allow for consistent KPI tracking.

For Union Gas, the backlog is not clearly defined. Our experience suggests that the goal is to have between two and four weeks of ready backlog at all times. A backlog that is too short does not allow for orderly planning and a backlog that is too long results in operational dissatisfaction and missed due dates. If the backlog begins to increase or trend above four weeks, then more resources should be added. A typical organization will have three options for resources. They can contract out more work, the employees can work more overtime, or they can hire more employees. Conversely, if the total work identified in the backlog begins to trend or drop below two weeks, the site can reduce the resources that are required to perform the work. The site could reduce the amount of outside contract work, reduce the amount of craft overtime, or ultimately reduce the size of the maintenance and engineering work force. If the backlog is calculated weekly and tracked annually, seasonal trends and other spikes can be clearly seen. By reviewing these types of records, a manager can ensure that the department is properly staffed.

## Asset Management Information Systems

A key part of the success of an overall asset management strategy is implementing an enterprise asset management system to help automate the collection, integration, and organization of asset data for improved decision making. Union Gas has already embarked on a strategy to move to a more integrated system landscape with SAP as the core enterprise platform. Several SAP modules are already in place at Union Gas and at Spectra Energy (Union Gas's parent company). Spectra Energy is presently using three instances of SAP (Spectra USA, SET West, and Union Gas).

Vesta was provided with CGI Consulting's presentation 'EAM Technology Strategy Assessment' (Sept. 2010). Overall we agree with the basic assessment and deliverable of the report. The report made the statement that maximizing application consolidation into a single application or ERP would reduce the application maintenance and administration costs and simplify user training and data integrity management. We want to underscore that the more a common integration platform can be developed, the greater the value to Union Gas.

It is our understanding that Union Gas will be implementing the corrosion tool 'Essentials' from GL Noble Denton. Given our limited time with Union Gas, we did not have opportunity to get into any detail on the corrosion side of the application but it is likely that this application could be implemented as an interfaced application with SAP. Customers often use "inspection" software that is interfaced with SAP. The goal here is to have SAP act as the system of record and use it to monitor the schedule and the status of the assets.

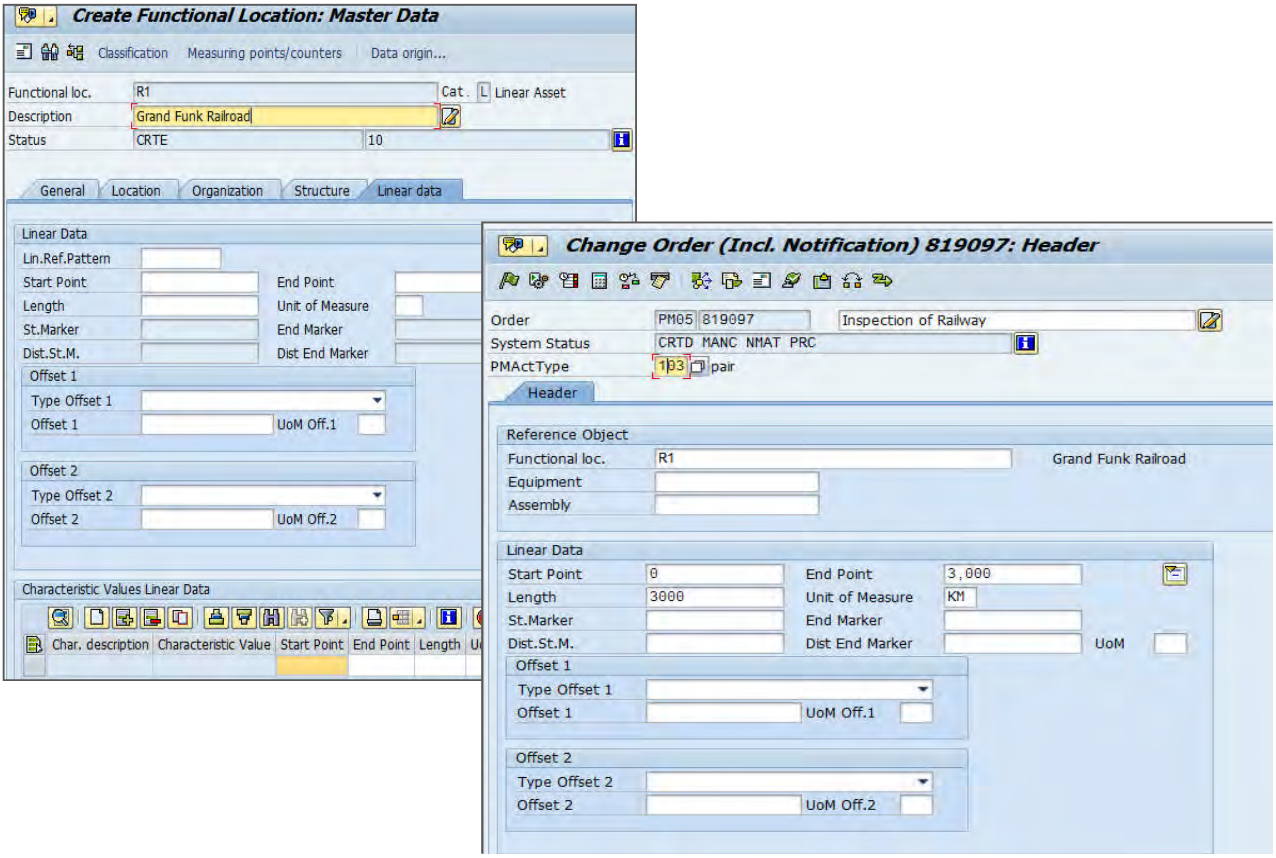
**Linear Asset Management**

Another area for Union Gas to consider is the linear asset management functionality that has been recently added by SAP. Linear assets (e.g. pipelines) are unique from plant level assets. Typically a non-linear asset (e.g. compressor, valve, motor) occupies a finite and bound space and can be tracked by its location or based on a parent-child hierarchy. Linear assets on the other hand, have linear properties and need to be managed as a continuous asset with dynamic segmentation. Linear assets have a length dimension that is represented by a means of start points and end points or by specifying the assets length. The need to represent and these assets which extend for several kilometers with changing characteristics and conditions requires modeling of a different kind, using SAP's linear asset functionality for SAP EAM.

The following table outlines some of the key areas that we believe will add value in the implementation of SAP EAM for linear assets:

| New Feature | Description | Target Users |
|---|---|---|
| Modeling of linear assets | Model linear assets | Maintenance |
| Linear asset work management | Enhancement of work order processing to support linear work definition including work orders, confirmations, and maintenance plans | Maintenance |
| Linear asset inspection and condition monitoring | Enhancement of notifications, measurement points, counters, and measurement documents to support linear information | Maintenance |

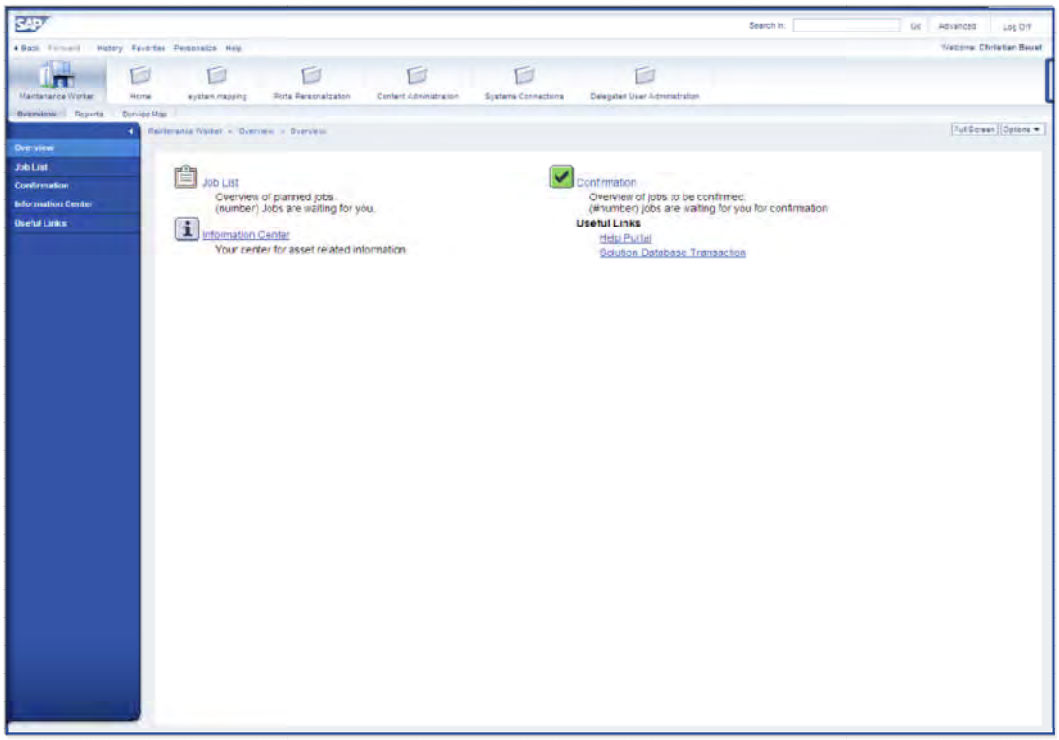
The following is a sample of new screens for linear assets in SAP EAM. The screens can of course be configured and as well as the type of additional data available on the master record for a linear asset. Although the screen is for a railroad asset, it has similar requirements for a pipeline.



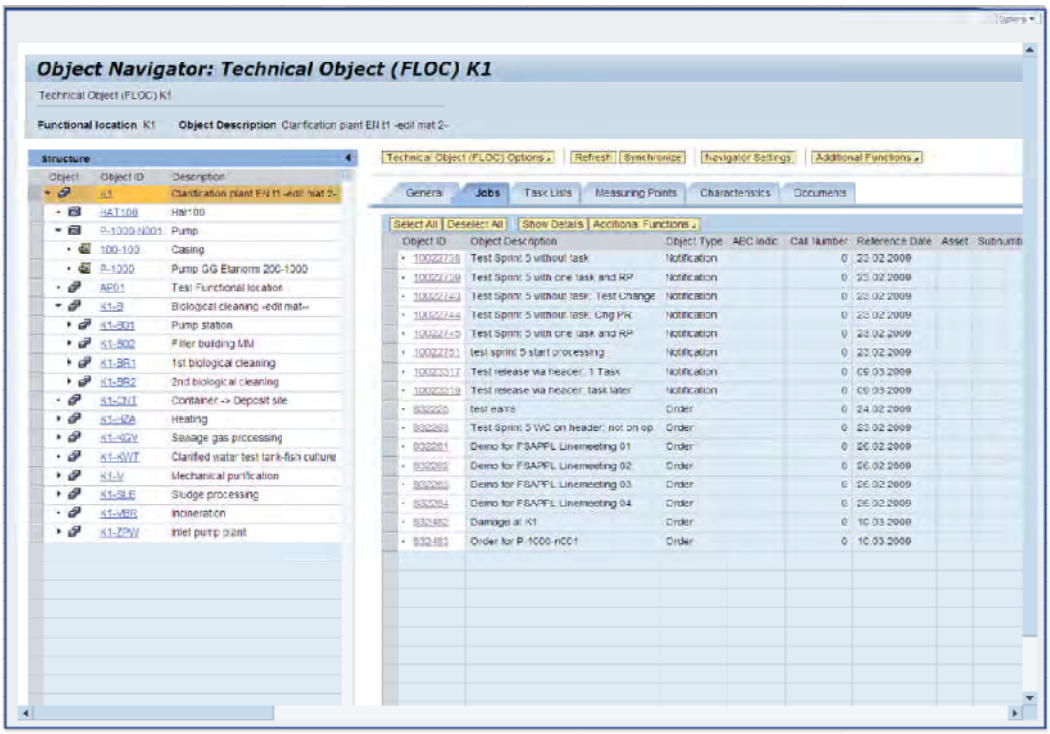

## End-user Simplification

SAP has also added new functionality to help with usabililty for the maintenance technician. It is a well known challenge that *casual* users of SAP EAM typically find the standard GUI (graphical user interface) difficult to use. This is particularly the case if a Technican for example is interacting with the system only a few times a day (vs. someone in Finance or HR who uses it throughout the day). In order to address this issue and help drive adoption, SAP has invested a tremendous amount of resources in developing a simplified front-end for end-users of EAM. Much of this new functionality is found in Enhancement Pack 5 of ECC 6.0. In the interviews it was pointed out that an upgrade to this enhancement package will be taking place soon. There is much more information we can share on this development but we felt it appropiate to include a few samples of the improved screens.

The first screen is described as the launch pad. Is provides a much more intutiave way for the technician to find the function he/she wants to perform at the time.




The second screen puts a wealth of information at the technician‘s finger tips. This asset navigator screen gives a quick way to get many pieces of valuable information quickly and easily. The technician can view jobs, standard procedures, documentation, measurement or inspection points, etc. (most of the objects and transactions he needs to do his work).




These are just a sample of some of the new functions that will improve the adoption of the EAM software, the processes it enables, and enforce the quality of data being entered into the system in order to make better business decisions.

## Compatible Units

Another area to highlight that should be considered in the future implementation of SAP EAM is compatible units (CU). CUs help designers and engineers to more quickly and efficiently define and estimate work to be performed. Compatible Unit Management is intended for industries that design their work using standard units of work. The standard unit is referred to as a compatible unit (CU). Each compatible unit results from the careful application of engineering standards that ensure complete consistency with other structures, systems, or work done previously. The compatible unit approach provides the following advantages:

- Shorter design cycles
- A reduction in field engineering and rework requirements
- More accurate job estimates

Using compatible units, you can predefine units of work, which you then enhance with the specific requirements for a particular job (job steps, duration, crew assignment, special tools, documentation, accounting data, and so on). Compatible units are designed to be reusable and have a modular structure. They represent smaller units of work that can be combined to describe more comprehensive activities. We understand that the entire SAP project needs a

blueprint and design but we felt that this feature of SAP that was primarily part of enhancement package 2 merited mentioned in the report.

## Work Management

### Work Orders & Planning

One necessary component for maintenance to successfully function as an asset management focused business is the need to collect data related to the maintenance of the assets. This requires the use of a work order to initiate, track, and record all maintenance activities. The work may start as a request that needs approval. Once approved, the work is planned, then scheduled, performed, and finally recorded. Unless the discipline is in place and enforced to follow this process, data is lost, and true analysis can never be performed.

Basic data such as the cost of labour, planned vs. actual hours, materials consumed, and technician feedback is captured on the work order and is used to assess the performance of individuals, the maintenance function, and overall asset condition. Finance, purchasing, regulatory and engineering functions all need information from maintenance – much of it originating from the work order.

According to the benchmark survey, 85% or respondents across Union Gas (100% at STO) reported that less than 50% of maintenance man-hours are charged to a work order. In addition, 78% of all respondents (90% at STO) reported that less than 50% of maintenance materials are charged to a work order. These two findings suggest that key data is not being captured on the majority of work orders which makes it near impossible for management to effectively audit the performance of its workers, life cycle costs, and improve processes. Contributing to this issue is the fact that STO in particular charges all maintenance work to the 'Plant level' rather than at the individual asset level making it difficult to determine accurate equipment costs. It is important to capture cost for "serialized" equipment. Also non-equipment charges are normally captured at a function or a location level. SAP calls the object a functional location but getting some cost detail below the plant level will be an important consideration to an overall asset management strategy.

Another area that should be addressed is the follow up of the work performed. While the majority of the respondents felt the work order data was available for historical analysis, less than 50% checked the completeness of the work. This lack of quality follow up is not just for auditing the work of the maintenance workers /contractors, but represents an opportunity to find areas where they need training or skills enhancements. It can also provide insights into how well work is being communicated to the maintenance workers and how well the work was actually performed. This level of follow up is necessary to be successful with maintenance planning and scheduling.

Planned work costs less to perform than unplanned work because there are less wasted resources when the work is controlled. When the work is unplanned, there are logistic delays getting the equipment shut down (access to rooms, switchgear restrictions, etc), organizing the labour resources, finding and delivering all of the spare parts, and perhaps even

coordinating the job with contractors. Less planning of all of these elements can result in considerable lost productivity from the workforce.

At least 80 percent of all maintenance work should be planned on a weekly basis. In addition, the schedule compliance should be at least 90 percent on a weekly basis. These are results that are usually difficult to obtain in most industries. However, some industries have up to 97% of all maintenance activities planned and scheduled weekly.

While at STO there is no direct planner and scheduler role defined, this role will need to be implemented if the organization is ever to achieve the full benefits of SAP EAM and its asset management strategy.

## Supply Chain Management

The inventory and procurement programs must focus on providing the right parts at the right time. The goal is to have enough spare parts, without having too many spare parts. It must be noted that no inventory and procurement process can cost-effectively service a reactive maintenance process. However, with the majority of maintenance work planned several weeks in advance, the practices within the inventory and procurement process can be optimized.

Many companies see service levels below 90 percent, which means stock outs run greater than 10 percent of requests made. This level of service leaves customers (maintenance personnel) fending for themselves, stockpiling personal stores, and circumventing the standard procurement channels to obtain their materials.

To prevent this situation, it is necessary to institute the type of stores controls that will allow the service levels to reach 95 to 97 percent with 100 percent data accuracy. When this level of stores and procurement performance is achieved, you can then start the next step toward improvement.

## Use/Relevance of PAS 55

As companies have continued to see the need to find a focused strategy to manage their assets, several efforts have been made to develop guidelines or standards. The first formal effort was the PAS-55 (Publically Available Standard) asset management specification. This is a British specification published by the British Standards Institute. It was originally published in 2004 and was updated in 2008. The goal of the standard was to provide a framework of policies and processes which allow an organization to properly manage their assets.

The standard is developed by applying the standard “Plan-Do-Check-Act” cycle to an organization’s assets. This framework is designed to balance the risk, cost and performance of any asset or asset system.

There have been several industry specific guidelines that have been derived from the PAS-55 documents. These include the EPA guidelines for water systems, the American Association of

State Highway and Transportation Officials guidelines for transportation systems, and the Canadian Gas Association "Guiding Document on Asset Management.

All of these efforts have led to the current effort to develop an ISO standard 55000, which is a standard on asset management systems. Vesta is participating in the Technical Advisory Group (TAG) for the United States. While the final standard is approximately 18 from publication, it shows the intense focus that companies are taking on optimizing the utilization of their assets.

## Benchmarking Survey

In the following section, we focus on the benchmarking process and provide a summary of the results. The actual interpretation of the results has been applied throughout this report to help reinforce Vesta's findings & recommendations.

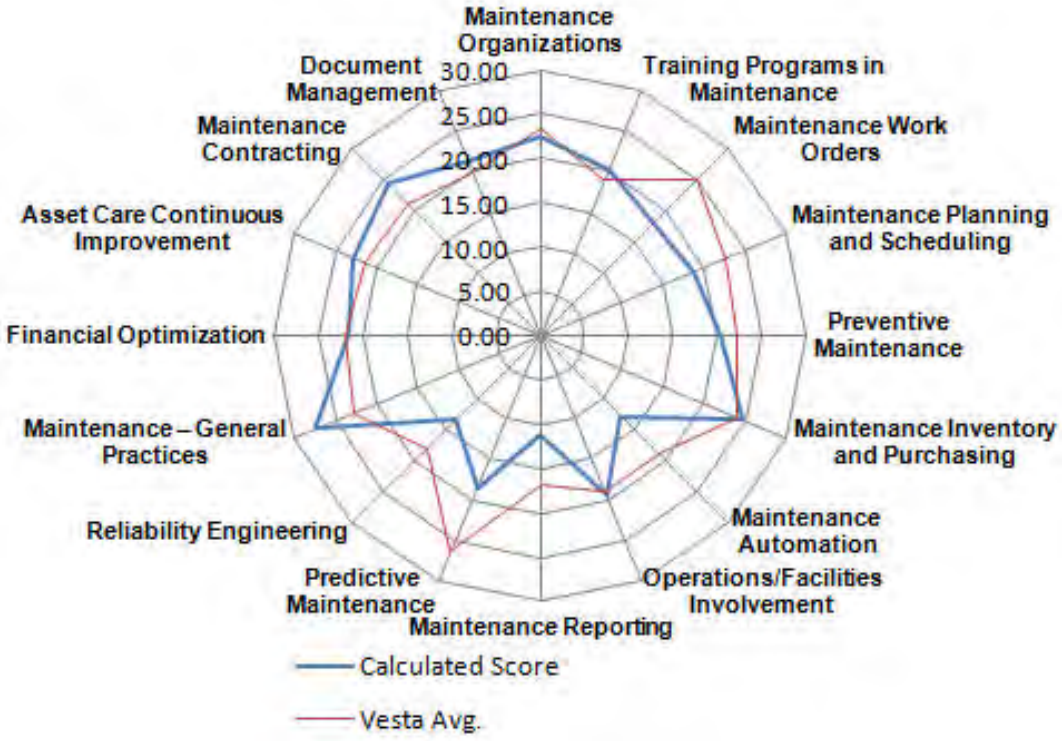
### Benchmarking Process Overview

Maintenance is one of the most misunderstood business processes for any company. Without an understanding of the basic goals and objectives for maintenance organizations, it is difficult to make improvements in the processes and deliver on its asset management strategy. Vesta's benchmark survey provides insights into how a sample of Union Gas's organization views maintenance and maintenance-related processes. The benchmark survey also provides a way to measure maintenance practices against other world class companies. with the goal of improving, not maintaining status quo.

Vesta's benchmarking database contains the survey results of over 1,000 companies across multiple geographies and industries. We believe this diversity to be an advantage for organizations that take Vesta's survey as it mitigates constraints to improvement, especially the "not invented here" paradigm. The more innovative the ideas that are discovered, the greater the potential rewards that can be gained from the adaptation of the ideas. It should also be remembered in many cases we are looking at *business processes*. It is companies that adapt business processes from outside their industries that will be leaders in a true "Best Practices" environment. This is one of the primary reasons that benchmarking outside the gas transmission and distribution industries is important for Union Gas in their efforts to improve their maintenance and reliability practices. And although Union Gas is effectively the sole supplier of natural gas in Ontario with little or no competition, the survey lends itself to Union Gas's result-focused culture (as evidenced by the use of scorecards).

### Benchmarking Survey Results

There were 15 respondents to the online survey from STO. The following spider diagram shows how Union Gas scored in each of the 16 categories relative to Vesta's benchmarking database. The highest possible score for a category is 40.


Maintenance Organizations
Training Programs in Maintenance
Maintenance Work Orders
Maintenance Planning and Scheduling
Preventive Maintenance
Maintenance Inventory and Purchasing
Maintenance Automation
Operations/Facilities Involvement
Maintenance Reporting
Predictive Maintenance
Reliability Engineering
Maintenance – General Practices
Financial Optimization
Asset Care Continuous Improvement
Maintenance Contracting
Document Management
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Calculated Score
Vesta Avg.

# Appendix A – List of Interview Participants

### Core Team

Curtis Charlton – Engineering Intern
Dave Craven –
Michelle George - Dir. Engineering Planning & Support
Mike Hildebrand – Compressor Field Manager
Chuck Legg – Manager GIS
Mike Lindley – IT Delivery Manager

### Engineering, Distribution & STO

Jim Burns – Mapping Services
Jeff Falkiner – Manager Station Engineering
Denise Spadotto – Manager Pipeline Engineering
Scott Walker – Manager Corrosion Engineering

### STO

Rob Elliott – STO Project Manager
Chris Falconer – Systems Operations Manager
Pete Fisher – Storage Field Superintendent Dawn
Louie Jeromel – Manager Compressor Operations
Ray Jump - Technician
Dan Wallace – Manager Transmission Pipeline & Storage
Bob Wellington – Maintenance Engineer
Matt Wood – Manager System Planning

### DistOps – Util

Carol Gosselin – Manager District P&D Support
Scott Harris – Util Services Manager London West
Diane Pisani – Util Services Manager Windsor West
Patti Wilson – Planning & Dispatch Manager SW

### DistOps – C&G

Andy Antoniou – Manager C&G Hamilton
Bryden Berkvens – Construction Support Engineer
Steve Jelich – Manager C&G Support

Michele Knoll – Manager Commercial Industrial Attachment Centre
Shane Korbely – Manager New Residential Attachment Centre
Chris Minor – Manager C&G NE

**DistOps – SMC**

Kevin Bowers – Manager Pipeline & Station Support
Lori Clark – Coordinator Stations & Pipeline
Lia Squires – Technician Manager Windsor/Chatham

**IT**

Shawn Bombardier – IT Team Lead DistOps
Glen Reaume – IT Manager, SAP
Jeff Shepherd – Applications Manager

# Appendix B – Reference Documents

- EAM Technology Assessment (CGI; Sept 2010)
- Union Gas Asset Management Strategy Update (Oct 2010)
- Inventory Optimization Report Out (KPMG; Apr 2011)
- Union Gas General Presentation (2011)
- Canada Gas Association – Guiding Document on Asset Management (Nov 2009)
- Union Gas Asset Management Strategy Development – Project Kickoff (Sept 2011)
- Union Gas Asset Management Strategy Development – Project Charter (Sept 2011)
- DistOps 101 Presentation
- DistOps Procedures, Process Models, Scorecards, SOP samples
- Engineering Scorecard samples
- STO Procedures, Process Models, Inspections, Work Order samples

Filed: 2012-05-04
EB-2011-0210
J.B-4-1-13
Attachment 2

# Enterprise Asset Management Technology Strategy Assessment

STRIVE HIGHER

## Final Deliverable

September 3, 2010

# Contents

# Contents

# Executive Summary

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. As the result of this 10 week technology strategy assessment of Union Gas' Asset Management program CGI recommends the development of an **EAM Transformation Strategy** and deployment of an **EAM Foundation Program** based on CGI's **Asset Management Leadership Practices**.

| EAM Foundation Program - Features | Benefits |
|---|---|
| Create an EAM technology foundation & SAP-centric application transformation roadmap | Reduces TCO of asset management technologies by extending software lifecycle & enabling self-service application across the enterprise |
| Engineer enterprise level asset master data standards & entity relationship diagrams | Reduces cost / consequence of information based errors, omissions and duplication – fosters data stewardship |
| Redesign Maintenance processes with focus on industry standards & guidelines | Improves asset integrity, reliability, safety– direct impacts on customer service by enabling standards driven maintenance tactics |
| Analyze and redesign EAM reporting and analysis instruments / methods | Improves performance metrics and asset information from a single point of truth will improve operational readiness and asset effectiveness |
| Redesign IS processes with focus on data governance and management of change | Enables IS service delivery to respond to the dynamics and complexity of an enterprise SAP ECC installation |
| Install cultural change management plan based on communication & training | Ensures successful adaptation of SAP integrated solution s supporting new or revised operations and maintenance processes |
| Convert EAM applications, data and tools into SAP integrated solution architecture | Simplifies system administration and enables more comprehensive end-to-end processes |
| Configure SAP interfaces to external systems and tools | Increases interoperability and exchange of information and data between systems and sources of knowledge |

# Background

# Project Background

- In 2009, Union Gas completed an Application Rationalization study
- Asset Management was identified as an area that could benefit from Application Rationalization
- The study identified the following opportunities regarding the Enterprise Asset Management ("EAM") Implementation:
  - Implement a single, consolidated EAM solution for all of Union Gas' assets
  - Establish a common work scheduling capability
  - Install a composite mobile application for work coordination
- Benefits to be gained:
  - Single source of asset management information
  - Improved and on-going control over the EAM data model
  - Improved EAM drill-down and reporting capability
  - Optimized work scheduling across the organization
  - Enhanced self-service

# Project Background (continued)

- Union Gas recently completed an application rationalization study
- The study provided the following conclusions:
  - Current architecture strategy includes GIS as the asset repository and Advantex to handle the work reporting and scheduling, which has some inherent disadvantages. Union Gas should evaluate the use of an Enterprise Asset Management (EAM) solution (like SAP PM) to support the key Work Management, Asset Management, Supply Chain and Finance processes.
  - Union Gas should determine the role of current and future applications within its FIS strategy and evaluate the need for an EAM solution; moreover, a Delivery Strategy should be defined to govern future implementations.

# Project Goals and Objectives

- Provide direction and guidance for the IT component of the Corrosion project, looking specifically at the feasibility of moving it, in whole or part, to SAP
- Develop and validate a SAP-based Enterprise Asset Management ("EAM") system strategy and implementation plan for the fixed capital assets of Union Gas
- Help align the priority and timing of future application replacement / development projects, considering their potential to migrate to a SAP-based EAM system
- Demonstrate how achieving these objectives can help Union Gas meet recommendations contained in the Guiding Document on Asset Management produced by the Canadian Gas Association

# Project Scope

- The scope of the strategy and plan will include only those capital assets used to deliver gas from the source to the customer
- The full lifecycle of these assets will be considered, including specification development / design, sourcing, purchasing, installation, maintenance and retirement
- The following systems will be included in the assessment:
  - ✓ MISOS
  - ✓ Corrosion
  - ✓ CARS
  - ✓ WARP
  - ✓ MAPCON
  - ✓ GIS (limited to data integration analysis)
  - ✓ Advantex R8
- Business requirements will be aligned to those defined in the Guiding Document on Asset Management produced by the Canadian Gas Association including:
  - ✓ Asset Health Review
  - ✓ Asset Management Ranking
  - ✓ Capital Optimization
  - ✓ Long Term Capital Planning
  - ✓ Life Cycle Costing
  - ✓ Maintenance Optimization

# Approach / Methodology

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| EAM Analysis and Business Case Approach | | | | | |
|---|---|---|---|---|---|
| **Phases:** | **Discovery** | **Requirements** | **Analysis** | **Validation** | **Business Case** |
| **Objective** | • Understand Business Strategies and Priorities<br>• Understand Requirements<br>• Confirm Project Scope | • Understand current-state of in-scope systems, applications and processes<br>• Understand business and technical requirements | • Analyze and consolidate observations<br>• Conduct gap-analysis | • Validate, review and revise observations | • Deliver business case, approach, roadmap, recommendations and executive presentation |
| **Activities** | • Confirm scope, objectives, reporting, and roles & responsibilities<br>• Interview stakeholders<br>• Identify key resources<br>• Establish teams, committees, and schedules<br>• Conduct kick-off meeting | • Assess key application data, functionality, and processes<br>• Review key processes or functional area business requirements<br>• Review in-scope EAM systems and document functionality<br>• Map current state application and business processes | • Review interface capability of the GIS system<br>• Consolidate analysis observations into a cohesive set of information<br>• Compare a maximum of eight (8) current processes / systems with SAP functionality<br>• Generate draft final report | • Conduct a validation workshop with stakeholders in order to confirm / validate / adjust observations<br>• Compare validated observations with industry leading-practices | • Define EAM strategy<br>• Identify project initiatives required to achieve the EAM strategy<br>• Prioritize the initiatives into an EAM roadmap / implementation plan<br>• Socialize, generate and present draft final report |
| **Methods** | • Interviews and with stakeholders<br>• Documentation review | • Interviews and workshops with stakeholders and key resources<br>• Process mapping | • Gap-analysis<br>• Application functionality mapping<br>• Stakeholder workshops | • Interviews and workshops with stakeholders and key resources | • CGI's business case framework |
| **Deliverables** | • Project Scope Document<br>• Project Charter<br>• Project Schedule | • Business Requirements | • Application current-state processes, requirements & storyboards<br>• SAP/In-Scope Applications relationship diagram<br>• EAM system requirements<br>• SAP functionality summary<br>• SAP-GIS data integration points | • Validated Deliverables from Analysis phase<br>• Business benefits of a SAP based EAM strategy | • Prioritized application migration list, dependencies and implementation efficiencies<br>• Business Case, Approach, Roadmap and Recommendations<br>• Executive Presentation<br>• Final Report |
| **Timeline** | • 1 Week | • 2 Weeks | • 3 Weeks | • 2 Week | • 1 Weeks |
| **Resources** | **CGI**: Project Director, IT Strategy Lead, Business Analyst, EAM Subject Matter Specialist, SAP Plant Maintenance Specialist<br>**Union Gas**: Project Manager, Subject Matter Experts | | | | |

# CGI's Asset Management Leadership Practices will provide Union Gas with a strategic roadmap to build an EAM Foundation Program

The EAM Foundation Program provides a framework for the development, testing and deployment of new and revised technology and business architectures supporting a progressively maturing SAP-centric Union Gas' EAM Maintenance Operations and Information Service Delivery.

# CGI Asset Management Leadership Practices

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## CGI's Asset Management Leadership Practices will provide Union Gas with a strategic roadmap to build a standards-driven EAM Foundation Program to effectively:

| | |
|---|---|
| **Vision** | Deliver an asset management **vision** that is truly enterprise in its commitment, scope & benefit |
| **Strategy** | Launch an EAM **strategy** that traverses all related processes, technologies and culture |
| **Objectives** | Reconcile and realign **objectives** to standardize operation procedures and leading practices |
| **Operating Model** | Develop a harmonic operation and maintenance **operating model** geared to compliance |
| **Governance** | Install an asset management **governance framework** that is rigorous and robust |
| **Process** | Design federated **full lifecycle asset management processes** that are clearly understood |
| **Roadmaps** | Develop a progressive **implementation roadmap** paced at the speed of technological change |
| **Metrics** | Develop **high integrity metrics** that provide meaningful measurement of EAM performance |
| **Project** | Deploy **transformation project** using education & mentoring tools to manage cultural change |

# Standards-driven EAM Foundation Program

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**EAM Foundation Program** provides the key technical and process enablers to work towards **Canadian Gas Association Guide Document for Asset Management.**

**Technology enablers**:

- EAM entity relationship data diagrams
- Consolidation / control of EAM master data
- Single-point of truth for EAM knowledge
- IS management of change / governance practice
- Asset data stewardship provided by custodians
- High integrity data - EAM reports and metrics
- Interfaces between SAP and external solutions

**Process enablers:**

- Standard driven maintenance strategies / tactics
- Comprehensive end-to-end work processes
- Maintenance standards governance practices
- Controlled review / approval processes
- Tactical knowledge transfer from aging workforce
- Improved asset transparency and analytics

**Industry Standards and Guidelines**

- Publicly Available Specification (PAS 55 )
- MIMOSA Open Standards for Collaboration
- Pipeline Open Data Standard (PODS.org)
- ISO 15926 Data Structure
- ISO 14224 Failure Modes
- SAP – Business Process (BPX) for Oil and Gas
- American Petroleum Institute (API)
- Petroleum Industry Data Exchange (PIDX)
- Federal Energy Regulatory Commission (FERC)
- North American Energy Standards Board (NAESB)
- PetroXML
- Predictive Modeling Markup Language (PMML)
- Public Petroleum Data Model (PPDM)

Use the following link to find more detail about these standards - http://www.sdn.sap.com/irj/bpx/index?rid=/webcontent/uuid/702526e6-8ebe-2910-9289-b5060b3436f4

# EAM Foundation Program process enablers supporting Maintenance Strategies

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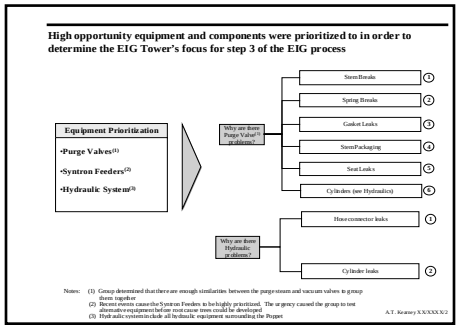
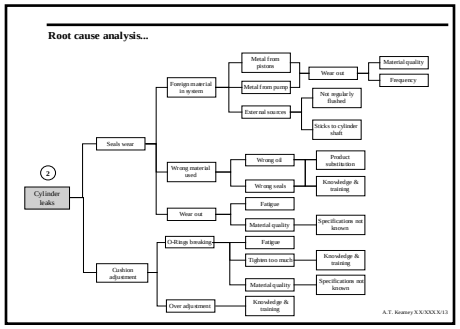
Execution of enterprise maintenance strategies guided by implementation of logical precision, predictive, and preventive maintenance processes

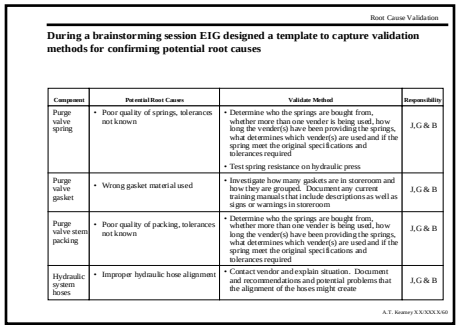
## Equipment Prioritization



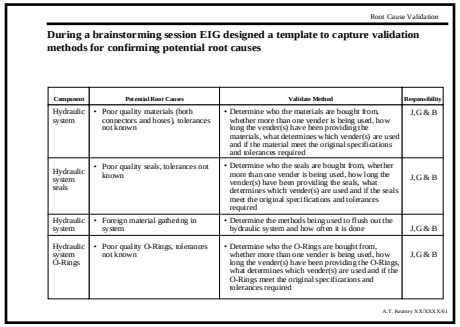

## Root Cause Tree Development



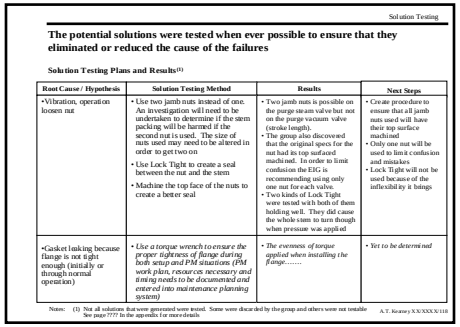

## Root Cause Validation




## Solution Generation




## Solution Testing




## Solution Implementation

| Precision Processes | Predictive Processes | Preventive Processes |
|---|---|---|

# EAM Foundation Program technology enablers supporting Maintenance Strategies

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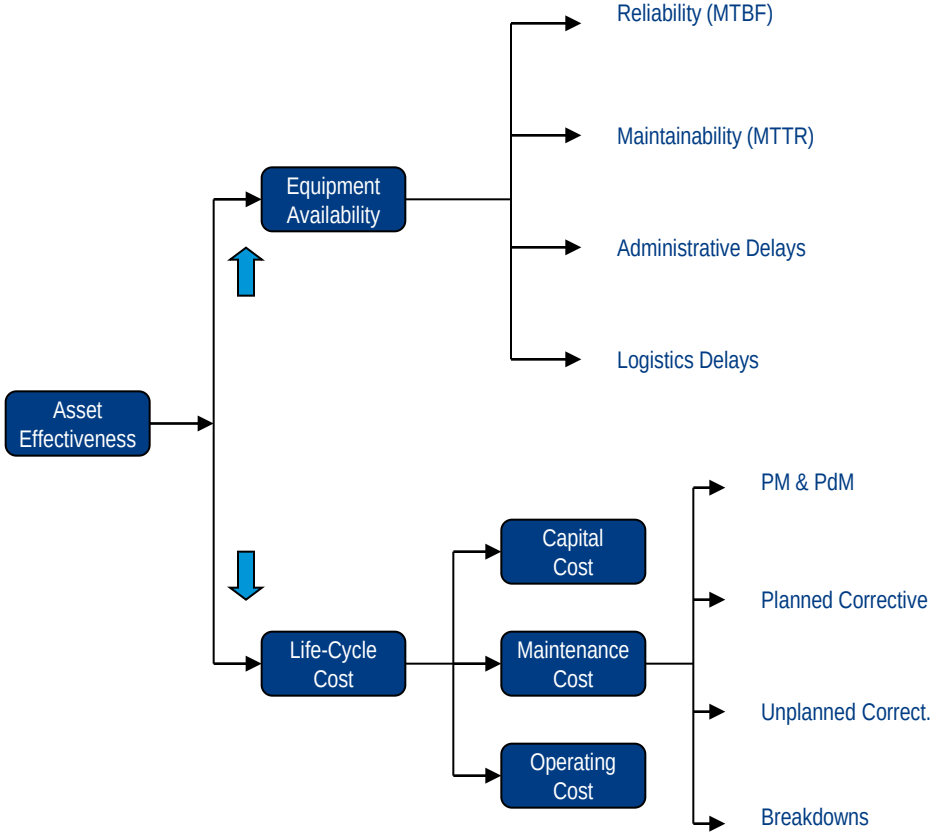
Technology enablers provide asset master data, asset information, tools, methods and applications to convert digital information into maintenance tactics and business outcomes



# Engagement Observations

# Our Approach included comprehensive documentation reviews and set of key stakeholder interviews over 10 weeks with the following participants

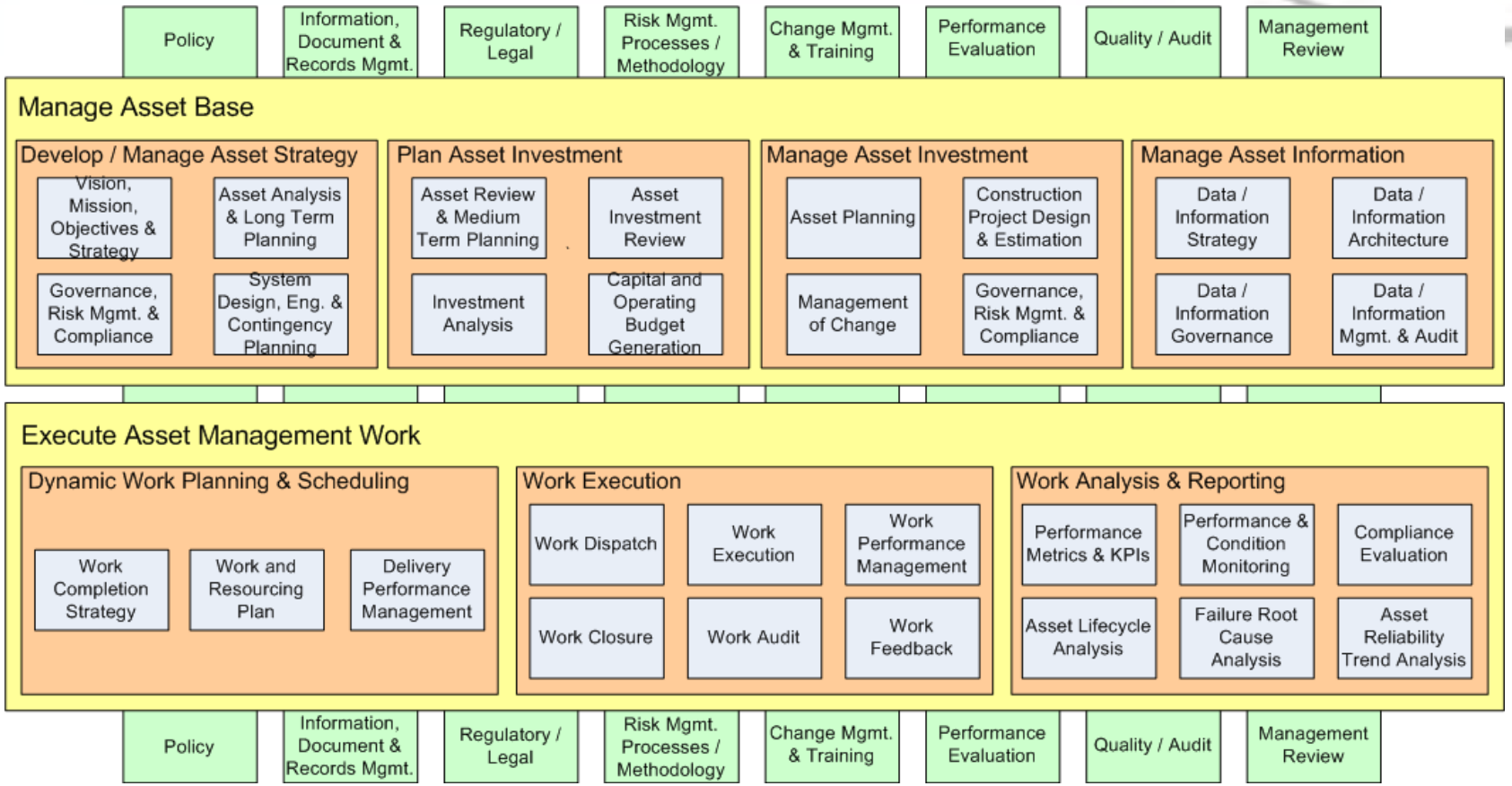
## Interview Participants

- George Bak
- Sue Blackburn
- Vanessa Brathwaite
- Lori Clark
- Ron Dantzer
- Susan Demers
- Dave Dowdall
- Julie Faas
- Jeff Falkiner
- Laverne Hanley
- Caroline Hayes
- Charlie Higgins
- Nick Jones
- Chuck Legg
- Michael Lindley
- Glen Reaume
- Angela Scott
- Jeff Shepherd
- Denise Spadotto
- Joe Traczynski
- Cathie Vannieuwenhuyze
- Scott Walker
- Matt Wood

## Key Documents Reviewed

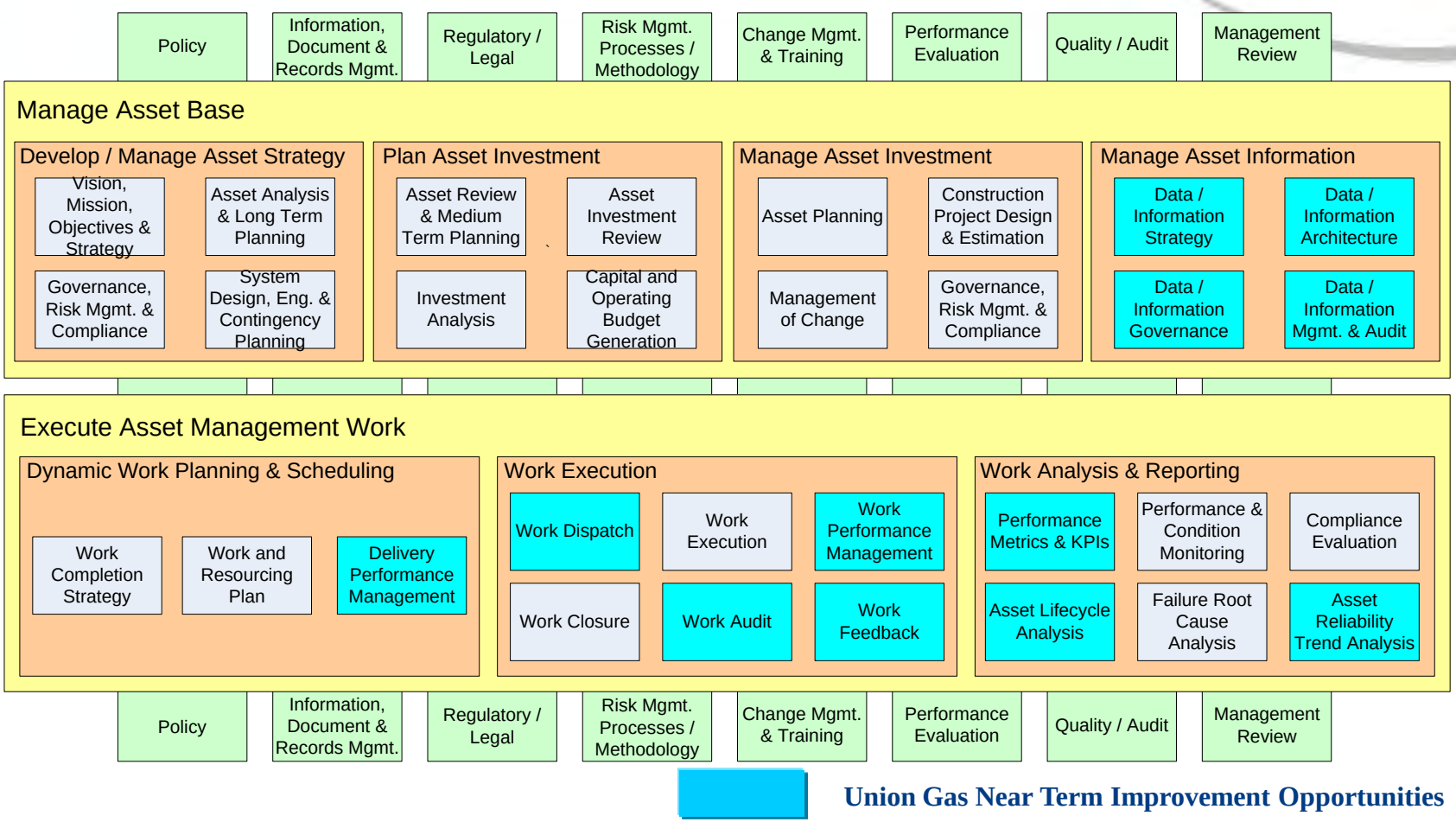
- Spectra Energy Information Technology Strategy 2009 – 2011
- FIS Asset Management Overview
- Target FIS Strategy
- Station Equipment Inventory
- OMS Overview
- OMS Manual – Performance Standards and Performance Guidelines
- STO System Overview
- SAP Plant Station Location
- Spectra Energy OPA Requirements Handbook – Operations Performance Assurance Framework
- CGA Asset Management Taskforce – Guiding Document on Asset Management

# Our Asset Management Framework identifies the critical components necessary for an effective EAM program accompanied by the supporting pillars




**Part of our approach included comparing your current Asset Management technology to our Asset Management Framework in order to identify opportunities for improvement**

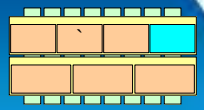
# Our observations identified the following areas as near term improvement opportunities




**Union Gas Near Term Improvement Opportunities**

**The next few slides provide insight into the high priority improvement opportunities**

# Master data cleansing, normalization and standardization forms the foundation for Enterprise Asset Management



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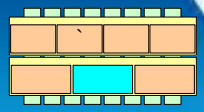
| Observations | CGA EAM Element | Implications |
|---|---|---|
| • Asset data is incomplete and inaccurate<br>• The missing data and data inaccuracies have not been quantified<br>• Few asset management oriented metrics and reports exist to provide management with performance visibility. | Asset Health Review | Not possible without complete and accurate data, metrics and reports |
| | Asset Management Ranking Mechanism | Potential for incorrect opportunity ranking |
| | Capital Optimization | Less than optimal expenditures of capital, resulting in increased maintenance costs or increased probability of asset failure |
| | Long-term Capital Planning | Long-term capital requirements estimates that are either too low or too high |
| | Life Cycle Costing | Incorrect economic asset life determination and repair / replace decisions |
| | Maintenance Optimization | Increased cost of maintenance or increased probability of asset failure |

**Data integrity standards and supporting processes will form the cornerstone of a successful asset management program**

# Asset management processes, applications and data characteristics are distributed and / or fragmented



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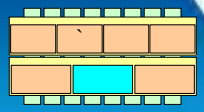
| Observations | CGA EAM Element | Implications |
|---|---|---|
| • Processes have been mapped, but do not cross organizational silo boundaries<br>• No higher level processes and / or management framework to relate the working level processes to each other across the entire asset management process<br>• Asset data is stored in a variety of applications that are not integrated together | Asset Health Review | Significant challenges assembling asset related data, thereby increasing the time and cost required |
| | Asset Management Ranking Mechanism | Incorrect ranking of initiatives, based on flawed information |
| | Capital Optimization | Less than optimal capital expenditures based on flawed information |
| | Long-term Capital Planning | Inappropriate priorities for long-term capital expenditure based on flawed information |
| | Life Cycle Costing | Significant challenges assembling asset related data, thereby increasing the time and cost required |
| | Maintenance Optimization | Significant challenges assembling asset related data, thereby increasing the time and cost required; |

**Asset management attributes need to be consolidated such that asset and work information can be obtained from a single view of the truth that has proven integrity**

# An asset management governance structure is needed to unify the asset management program



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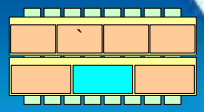
| Observations | CGA EAM Element | Implications |
|---|---|---|
| • Asset management is performed by pockets of employees in various parts of the organization<br>• These groups perform similar tasks with different applications, processes and practices | Asset Health Review | Data and process inconsistency will make data assembly challenging, thereby increasing time and cost |
| | Asset Management Ranking Mechanism | Different asset management organizations may conflict over the ranking of competing opportunities |
| | Capital Optimization | Same as above |
| | Long-term Capital Planning | Same as above |
| | Life Cycle Costing | Significant challenges assembling asset related data, thereby increasing the time and cost required |
| | Maintenance Optimization | Significant challenges assembling asset related data, thereby increasing the time and cost required |

**A single governance model for asset management is needed to maintain application, process and data standard uniformity across the organization and over time**

# With the exception of the USRs, technicians are lacking in performance metrics and standards



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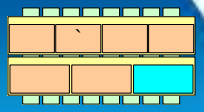
| Observations | CGA EAM Element | Implications |
|---|---|---|
| • With the exception of the Utility Service Representatives (USRs), there are no metrics regarding the productivity of technical field resources and work quality reviews / audits are not performed<br>• Supervisor / planner span of control is low (between 6 and 9 technicians)<br>• Other gas utilities have spans of control between 25 and 40 | Asset Health Review | Improved data quality |
| | Asset Management Ranking Mechanism | Minimal impact |
| | Capital Optimization | Increased capital requirements for asset replacement |
| | Long-term Capital Planning | Same as above |
| | Life Cycle Costing | Reduced economic asset life, leading to increased capital costs |
| | Maintenance Optimization | Increased total maintenance costs and reduced shareholder returns |

**A more disciplined approach to technician management, will lead to a more productive organization and increase the quality of the work and subsequent data entry into the asset management applications**

# The current asset management program is least mature in the STO area where an asset failure could be eventful to eastern North America



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| Observations | CGA EAM Element | Implications |
|---|---|---|
| • Asset management processes and applications do not focus on the part of the business where a failure would have the largest impact on Union Gas and other natural gas utilities Storage and Transmission Operations (STO)<br>• They are focused on distribution and transmission outside of STO<br>• Need for an asset criticality assessment methodology | Asset Health Review | Minimal impact |
| | Asset Management Ranking Mechanism | Minimal impact |
| | Capital Optimization | Increased capital requirements for asset replacement |
| | Long-term Capital Planning | Same as above |
| | Life Cycle Costing | Reduced economic asset life, leading to increased capital costs |
| | Maintenance Optimization | Increased total maintenance costs and reduced shareholder returns |

**Converting the MAPCON application (which provide asset management functionality to STO) to SAP will be a priority for the proposed implementation roadmap / plan**

# Other Key Findings

Our engagement identified other interesting opportunities for improvement in the following areas:

- Corrosion Register; and
- Process Mapping

# The Corrosion Register and associated processes could be streamlined to increase labour productivity and reduce the overall cost of the Corrosion avoidance program

- The Corrosion application introduces wasted labour and uncertainty
  - No integration with GIS results in incorrect test locations in GIS and Corrosion Register test points not lining up with maps, wasting technician time to find test locations
  - Manual process to notify Corrosion team of new pipes, and only after the pipe has been installed and GIS has been updated, resulting in the probability of pipes not getting annual Corrosion testing
  - Self-directed work order management, basing the success of the Corrosion team on their experience and dedication
    - 25 Corrosion team members
  - Under the current Corrosion program, for pipes that are tested once every 3 years, it can take up to 6 years to address a negative corrosion reading, provided it is fixed within 2 attempts
  - Field-based computing solution is under-utilized
  - No work quality inspection program

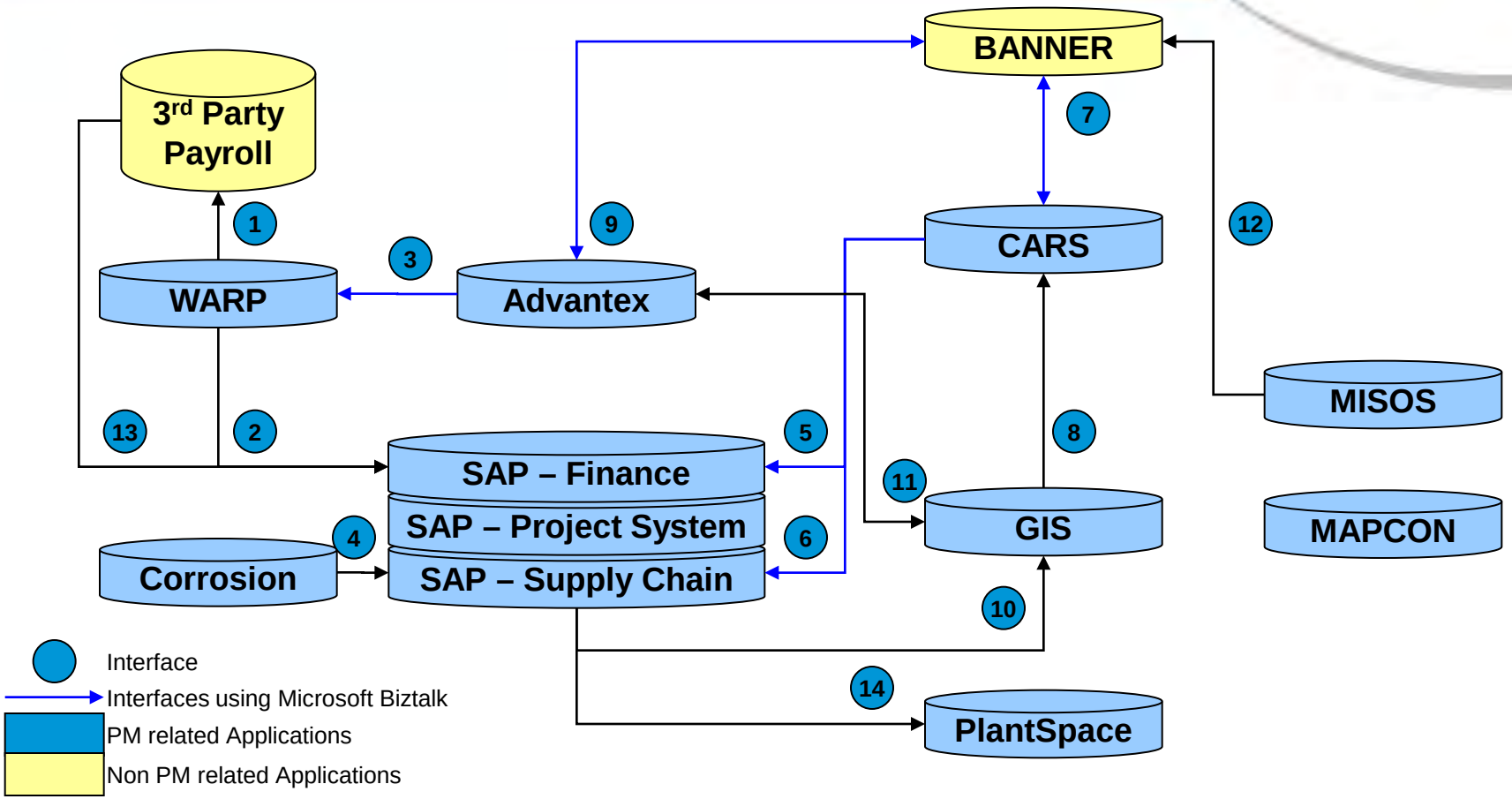
**Insufficient follow-up processes and timely feedback loops result in multi-year lag time to address issues, exposing assets to unnecessary failure possibilities**

# Although processes have been mapped for much of the asset management work, they lack context and do not encompass the end-to-end asset management process

- Previously completed process mapping
  - Some EAM processes have been previously mapped
  - Anecdotal evidence highlights that process compliance is not pervasive
  - Process maps localized / confined within organizational boundaries
  - Do not address end-to-end asset lifecycle
  - Do not address hand-offs between organizational silos
  - Do not provide context of how the processes fit into a larger EAM program
- Opportunities for Improvement
  - Addition of processes for analyzing the maintenance work data
  - Metrics enhancement for asset or personnel performance
    - Including asset reliability and availability
  - Process for maintaining the asset base with the lowest overall cost
    - Add asset lifecycle costing information
  - Broaden work quality inspection / audit program

**Well defined processes and associated metrics provide work context and increase the probability of achieving asset management strategies and objectives**

# The current asset management technology environment is an association of diverse applications that limit the performance of the asset management program




**The current application architecture would benefit from a single core application that would increase asset management functionality and reduce the number of interfaces, thereby also reducing the long term application maintenance costs**

# The current asset management application topology matrix highlights the functionality and overlap of the current applications

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| Design | Material Records | Asset Records | Long-Term Planning | Short-Term Scheduling | Procurement | Materials Tracking | Asset Tracking | Work Order Execution | Time Tracking | Customer Service and Billing |
|---|---|---|---|---|---|---|---|---|---|---|
| PlantSpace | | | | | | | | | | |
| GIS (Outside Fence) | | GIS | | | | | | | | |
| | | | | Advantex R8 (Plan & Dispatch) | | | | Advantex R8 | | |
| | | Banner (Meters) | | | | | Banner (Usage) | | | Banner |
| | | Corrosion | | | | | Corrosion | | | |
| | | MAPCON | | | | | MAPCON | | | |
| | | MISOS | | | | | MISOS | | | |
| | | CARS (For Construction) | | | CARS (Meters and Materials Tracking) | | | | CARS (Project Time) | |
| | | | WARP (Crewing Plans) | | | | | | WARP (Timesheet) | |
| | SAP MM | | | | SAP MM (Procurement and IM) | | SAP AA (Depreciation) | | | SAP FI/CO |

**Maximizing application consolidation into a single application or ERP would reduce the application maintenance and administration costs and simplify user training and data integrity management**

# Application interfaces contribute to development and long term application maintenance costs

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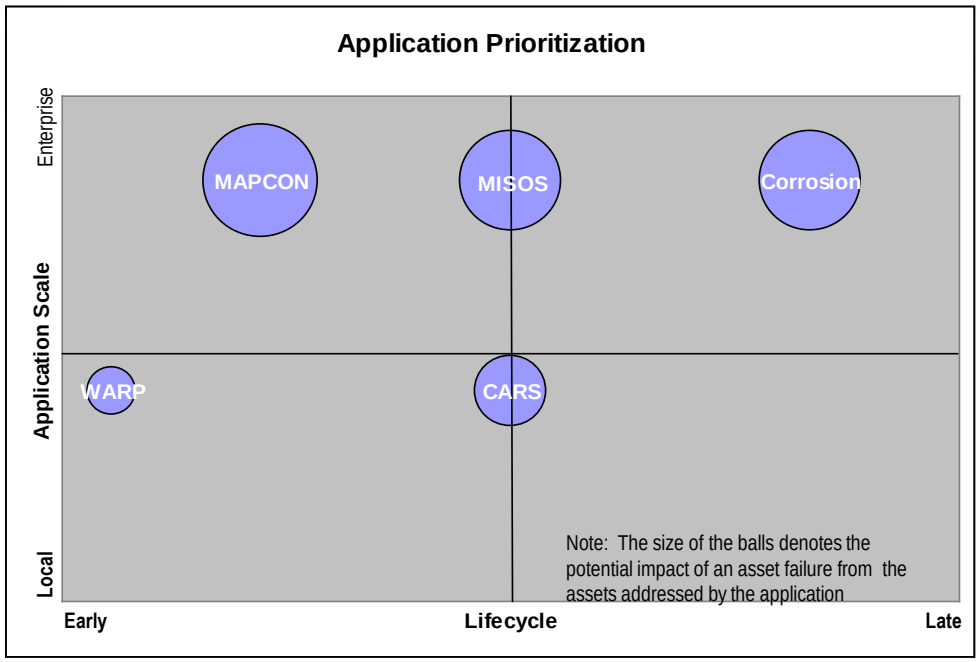
| | Payroll | SAP | Advantex | WARP | Banner | GIS |
|---|---|---|---|---|---|---|
| Corrosion Register | | √ | | | | |
| MAPCON | | | | | | |
| MISOS | | | | | √ | |
| CARS | | √√ | | | √ | √ |
| WARP | √ | √ | | | | |
| Advantex | | | | √ | √ | |
| GIS | | √ | √ | | | |
| PlantSpace | | √ | | | | |

- MAPCON is a standalone application with no interfaces
- The Corrosion Register, MISOS and PlantSpace have one (1) interface each
- Advantex and GIS each of two (2) interfaces
- CARS has four (4) interfaces

**One objective of a single application asset management architecture would be to decrease the long term maintenance costs by decreasing the number of interfaces**

# Prioritization of application conversion to SAP is based on the scale of the application, lifecycle status and asset criticality covered by the application




## OTHER CONSIDERATIONS

MAPCON:

- Standalone application
- Not fully developed
- Should Union Gas continue to develop this application if it is moving to SAP?

MISOS:

- Well received by user community
- Similar functionality to MAPCON
- Some merit to converting it to SAP at the same time as MAPCON

CARS:

- Most complex functionality
- Largest number of interfaces

| Current Application | Implementation | Maturity | Comments |
|---|---|---|---|
| Corrosion Register | 1995 | Sunset | Limited available technology support (PowerBuilder) |
| MAPCON | 2006 | Modern | Standalone, not fully developed |
| MISOS | 2001 | Modern | Partially re-written in 2010 |
| CARS | 2001 | Modern | Complex functionality and interfaces |
| WARP | 2001 | Modern | Re-written in 2010 |
| Advantex | 2007 | Modern | Upgraded in 2007 |
| GIS | 2010 | Modern | Currently undergoing roll-out |

**These factors encourage SAP conversion in the following sequence: Corrosion, MAPCON / MISOS, and CARS / WARP**

# Asset Management Practices at Other Natural Gas Utilities

# The asset management issues being experienced by Union Gas are consistent with other natural gas utility companies

- As part of this engagement, CGI discussed asset management with other natural gas utilities resulting in the following findings:
- Master Data:
  - All participants identified data completeness and data accuracy as an issue that they were struggling to overcome
  - Some have completed inventories of specific types of assets, but in general most are just beginning to address this issue
- Processes:
  - Some participants are beginning to map and document their asset management processes
  - There is general realization that processes need to be designed in order to stop the growth of various issues, including inaccurate and incomplete master data
- Governance Structure:
  - Each organization has its own unique governance structure
  - Some organizations have organized an Asset Management practice with a small number of staff (under 10), who set standards, monitor performance and report to the regulator

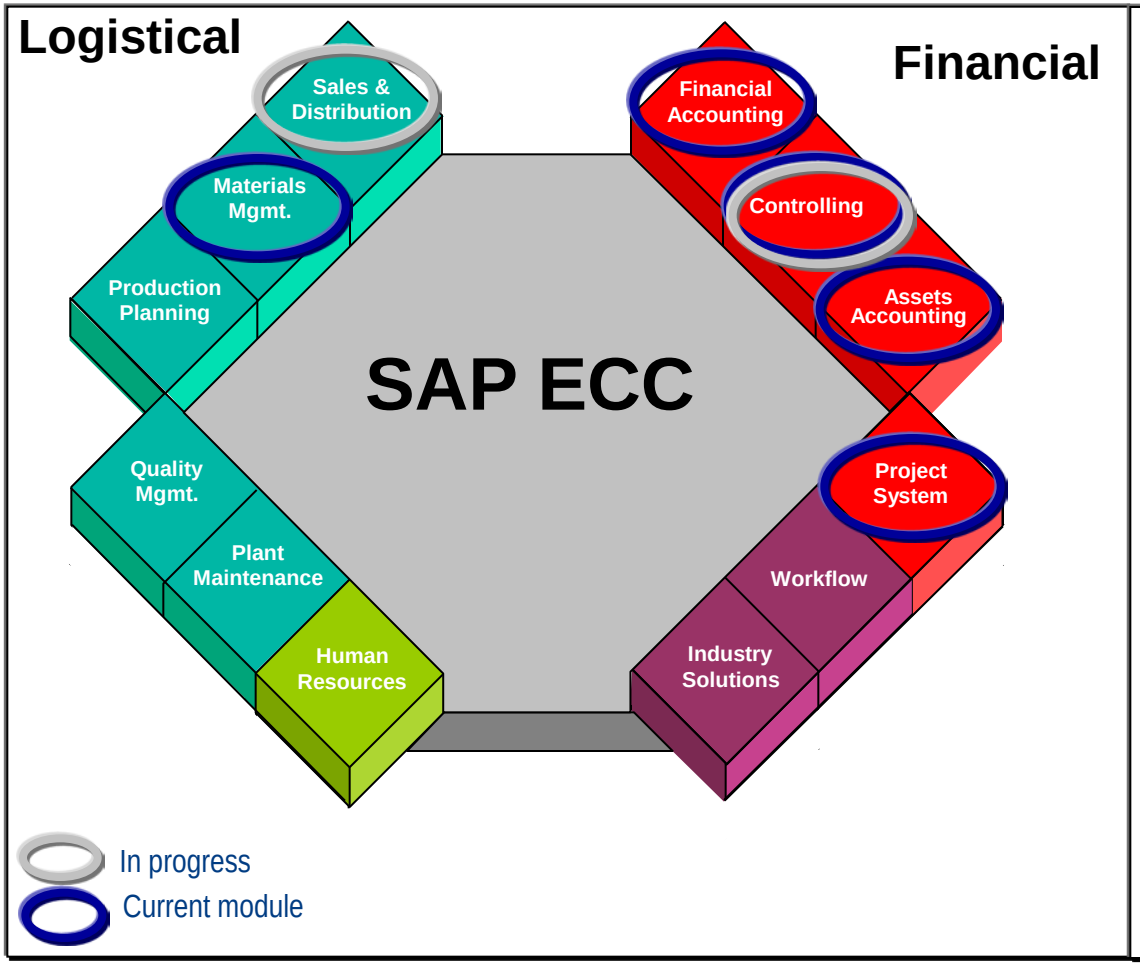
# The asset management issues being experienced by Union Gas are consistent with other natural gas utility companies

- Performance Metrics
  - Participants have identified that there are few asset and personnel performance metrics being measured and tracked
  - The reason for the lack of performance metrics is the lack of useful, accurate and complete data
  - The one exception to these observations was in the customer-facing technicians, where all participants measure performance to customer calls
- Systems:
  - Although some industry participants have generated their own asset management applications, the predominant tool among the participants was SAP – PM
  - GIS tools included Intergraph, ESRI and GE Small World
  - Click Software was the predominant dispatching tool
- Organization:
  - All participants are anticipating significant retirement from their field workforce over the next few years
  - Some participants had significantly larger span of control than Union Gas (e.g. 15:1, 25:1 and 40:1 ratios between technicians and planners / supervisors)

# EAM using SAP at Union Gas

Does SAP have the functionality required by Union Gas?

# Union Gas currently uses the following modules within the ECC suite of SAP




Current SAP ECC modules at Union Gas:

- Financial (FI)
  - General ledger (GL)
  - Account payable (AP)
  - Account receivable (AR)
- Controlling (CO)
  - Profitability analysis (PA)
  - Product costing (PC) (**in progress**)
- Assets Accounting (AA)
- Project system (PS)
- Material Management (MM)
  - Purchasing
  - Inventory Management (IM)
- Sales and distribution (SD) (**in progress**)

**With the exception of the HR module, all of the SAP-PM prerequisite modules are in use**

# In order to replace the current asset management application suite, a solution will need to meet the following requirements

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| Area | Functional Group | Requirement | Current Applications Meeting Requirement |
|---|---|---|---|
| Storage and Transmission Operations | Compressor Stations | • Asset Registry<br>• Maintenance Planning<br>• Workforce Management<br>• Engine Turnaround Management | • MAPCON |
| Engineering and Construction Services | Corrosion | • Measurement Registry | • Corrosion Register |
| | Construction | • Capital Project Management | • CARS |
| | Drafting and Mapping | • Asset Registry | • GIS and PlantSpace |
| | Stations | • Asset Registry | • MISOS |
| District Operations | Planning | • Annual Maintenance and Resource Planning | • WARP |
| | Stations | • Asset Registry<br>• Workforce Management | • MISOS |

**SAP has the ability to meet and enhance the asset registry, maintenance planning, workforce management, engine turnaround / capital project management, measurement registry, annual maintenance and resource planning functionality**

# SAP ECC has the ability to provide all of the functionality of the current suite of asset management applications, except for technician dispatch and design register

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| | SAP ECC | | | | | | | | | | NON-SAP | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Technical Objects | Measuring points | Work Centers (Crews) | Maintenance Planning | Notifications | Work Orders | Completion confirmations | Logistic Information System | Cross Application Time Sheet | Purchase Requisition | Design | Plan and dispatch |
| **Corrosion** | | | | | | | | | | | | |
| **GIS** | | | | | | | | | | | | |
| **PlantSpace** | | | | | | | | | | | | |
| **CARS** | | | | | | | | | | | | |
| **MISOS** | | | | | | | | | | | | |
| **MAPCON** | | | | | | Currently Manual | | | | | | |
| **Advantex** | | | | | | | | | | | | |
| **WARP** | | | | | | | | | | | | |

Current functionality that can be replaced and improved using SAP ECC
Current functionality that is not available in SAP

**The next eleven (11) slides provide greater detail regarding the SAP ECC / current asset management application overlap and gaps, in the application sequence above**

# SAP provides all of the functionality currently provided by the Corrosion Register

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| Corrosion |
| --- |
| CARS |
| MISOS |
| MAPCON |
| WARP |
| GIS |
| PlantSpace |
| Advantex |

| | |
| --- | --- |
| **Technical Objects** | **Municipalities and Stations** will be created as Functional locations.<br>**Distribution lines, Transmission lines**: each section number will be created as equipment linked to the municipality.<br>**Stations equipment:** all assets related to the station will be created as equipment.<br>**Measurement tools** will be created as Equipment.<br>The level of detail for each one of those objects will be responsibility of the Master data Management team. |
| **Measuring points** | Readers will be measuring points for a specific piece of equipment. |
| **Characteristics** | Values to be measured at each reader will be created as characteristics |
| **Measurement documents** | Survey information will be captured in SAP as Measurement documents |
| **Purchase requisition** | Purchase requisition documents will be used to request components or materials from Purchasing |

**SAP will provide a capable repository for Corrosion survey readings**

# SAP will record work time and provide enhanced reporting functionality that is challenging to achieve with the current asset management applications

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| Corrosion |
| --- |
| CARS |
| MISOS |
| MAPCON |
| WARP |
| GIS |
| PlantSpace |
| Advantex |

| | |
| --- | --- |
| **Time and activity report** | Corrosion users, currently doing time report via WARP, will use SAP-CATS for time report purposes. |
| **Interfaces** | In order to maintain consistency between applications, interfaces between GIS and SAP-PM will be developed for technical objects.<br>Two ways interface from SAP to Payroll will be required. |
| **Logistic Information system** | LIS provides standards reports and additional reports could be created as required. |
| **Users** | Users profiles could be created for Technicians, Specialist and Read only users. |

**SAP will provide improved reporting allowing for detailed analysis and trending of corrosion readings which will increase the useful life of pipeline assets**

# SAP has the ability to replicate CARS functionality without the complexity associated with a custom application

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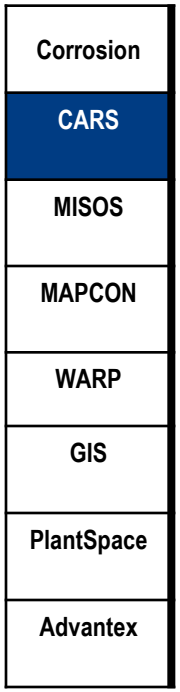
- Corrosion
- CARS
- MISOS
- MAPCON
- WARP
- GIS
- PlantSpace
- Advantex

| | |
|---|---|
| **Technical objects** | Functional location or equipment can represent assets under construction. |
| **Maintenance Orders** | Work orders for construction can be created including activities, BOMs and due dates, additionally work orders can be settled to Projects. |
| **Confirmation** | Activities and times can be reported manually or via CATS (Cross Application Time Sheet). |
| **Reports** | Standard work order reports can be generated in the Logistics Information System by Functional location, equipment, Work order type and activity. |
| **Purchase requisition** | Meter requisition will be done directly in SAP using Purchase Requisitions |

**Maintaining a complex custom application like CARS is expensive and rarely meets user needs. SAP provides a platform that requires little maintenance other than standard upgrades.**

# SAP reduces the number of interfaces to provide the same functionality as CARS




| | |
|---|---|
| **Time and activity report** | CARS users, currently doing time report via WARP, will use SAP-CATS for time report purposes. |
| **Interfaces** | Interface (for technical objects) between SAP and GIS created for Corrosion will be reused.<br>New interface between SAP and Banner is required. |
| **User profile** | Drafters and users from Attachment center will require a user profile to create and process work orders. |

**By reducing the number of interfaces, SAP decreases the long term maintenance costs of providing capital asset investment functionality**

# MISOS Functionality met by SAP

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- Corrosion
- CARS
- **MISOS**
- MAPCON
- WARP
- GIS
- PlantSpace
- Advantex

| | |
|---|---|
| **Technical objects** | Includes stations over 1.7 kpi. Stations will be created as Functional locations and all assets related to the station will be created as equipment. Additionally Test equipment will be created. |
| **Maintenance planning** | All scheduled inspections will be created for equipment related to stations over 1.7 kpi. |
| **Maintenance Orders** | Work orders will be created based on scheduled inspections or manually if required. |
| **Confirmation** | Inspection results will be captured, against work orders, manually or via CATS (Cross Application Time Sheet). |

**SAP will also provide a single source for test equipment inventory and calibration records**

# MISOS Functionality met by SAP (continued)

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- Corrosion
- CARS
- **MISOS**
- MAPCON
- WARP
- GIS
- PlantSpace
- Advantex

| | |
|---|---|
| **Time and Activity report** | MISOS users, currently doing time reports via WARP will use SAP-CATS for time report purposes. |
| **Interfaces** | New interface between Banner and SAP is required to verify meter creation based on pressure.<br>MISOS users will be added to the interface between SAP and Payroll<br>The interface (for Technical objects) with PlantSpace created for MAPCON will be reused for MISOS. |
| **Reports** | Standard Due date report<br>Standard Missing activities report |
| **User profiles** | Technicians.<br>Engineers.<br>Read only users. |

**Another benefit of converting custom applications to SAP is the ability to re-use work, like the PlantSpace interface identified above**

# MAPCON Functionality met by SAP

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- Corrosion
- CARS
- MISOS
- **MAPCON**
- WARP
- GIS
- PlantSpace
- Advantex

| | |
|---|---|
| **Technical objects** | Big compressors stations will be created as Functional locations and all assets related to them will be created as Equipment. |
| **Maintenance planning** | This functionality includes planned schedule per asset and planned activities per inspection, additionally Bills of Material can be linked to the Plan. |
| **Notifications** | Work order request will be created as notifications; notifications will be approved and then converted to work orders. |
| **Maintenance Orders** | Automatic work orders: for preventive maintenance automatic work orders will be created.<br>Manual work orders: for repairs, orders can be created manually or if a trigger event is identified, then orders can be created automatically. (i.e. based on SCADA systems). |
| **Confirmation** | After a work order is executed, activities are reported as completed, including times and quantities. Confirmation can be created manually or via CATS (Cross Application Time Sheet). |

# MAPCON Functionality met by SAP (continued)

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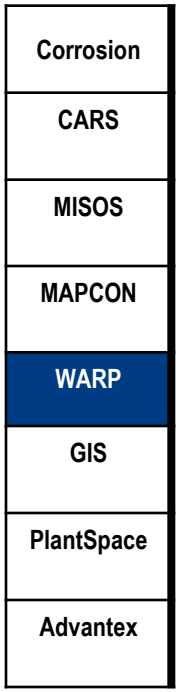
- Corrosion
- CARS
- MISOS
- **MAPCON**
- WARP
- GIS
- PlantSpace
- Advantex

| | |
|---|---|
| **Time and activity report** | MAPCON users, currently doing time report via WARP, will use SAP-CATS for time report purposes. |
| **Interfaces** | Interface with PlantSpace will be created for Technical objects consistency.<br>MAPCON users will be added to interface between SAP and Payroll |
| **Reports** | Standard Work order report with activities, due dates and quantities.<br>Standard PM Compliance report: indicating percentage of completion for work orders. |
| **User profile** | Operator: create notification (work order request).<br>Mechanic: execute work order.<br>Manager: approve work request and trigger creation of work order (creation of work order should be automatic upon approval). |

# WARP Functionality met by SAP

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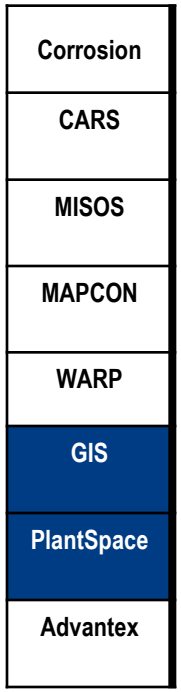
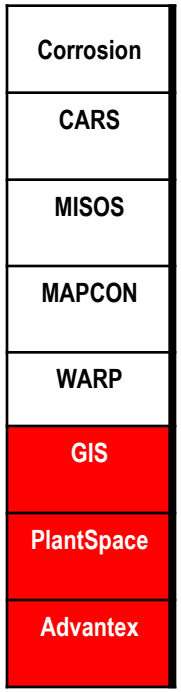
|---|---|
| **Master data** | Employees who report time via WARP, need to be created in SAP-HR |
| **CATS** | WARP can be replaced by SAP-HR and CATS functionality (Cross Application Time Sheet). |
| **Intranet** | In order to avoid cost related to user licensing, it is recommended to implement an intranet portal to capture the information. |
| **Interfaces** | Interface from SAP to Payroll.<br>Interface from Advantex to SAP. |
| **Users** | Current users reporting in WARP will be transferred to SAP gradually, starting with Corrosion, then MISOS, MAPCON, CARS and finally users not related to those applications. |

# GIS / PlantSpace Functionality met by SAP




| | |
|---|---|
| **Equipment and functional locations** | GIS and PlantSpace will trigger the creation of Functional location and Equipment. |
| **Data repository** | SAP will act as central repository for Master Data. |
| **Interfaces** | GIS and PlantSpace will be in sync with SAP using two way interfaces<br>Interfaces from GIS or PlantSpace with other systems should be avoided and any communication between applications should be done through SAP. |

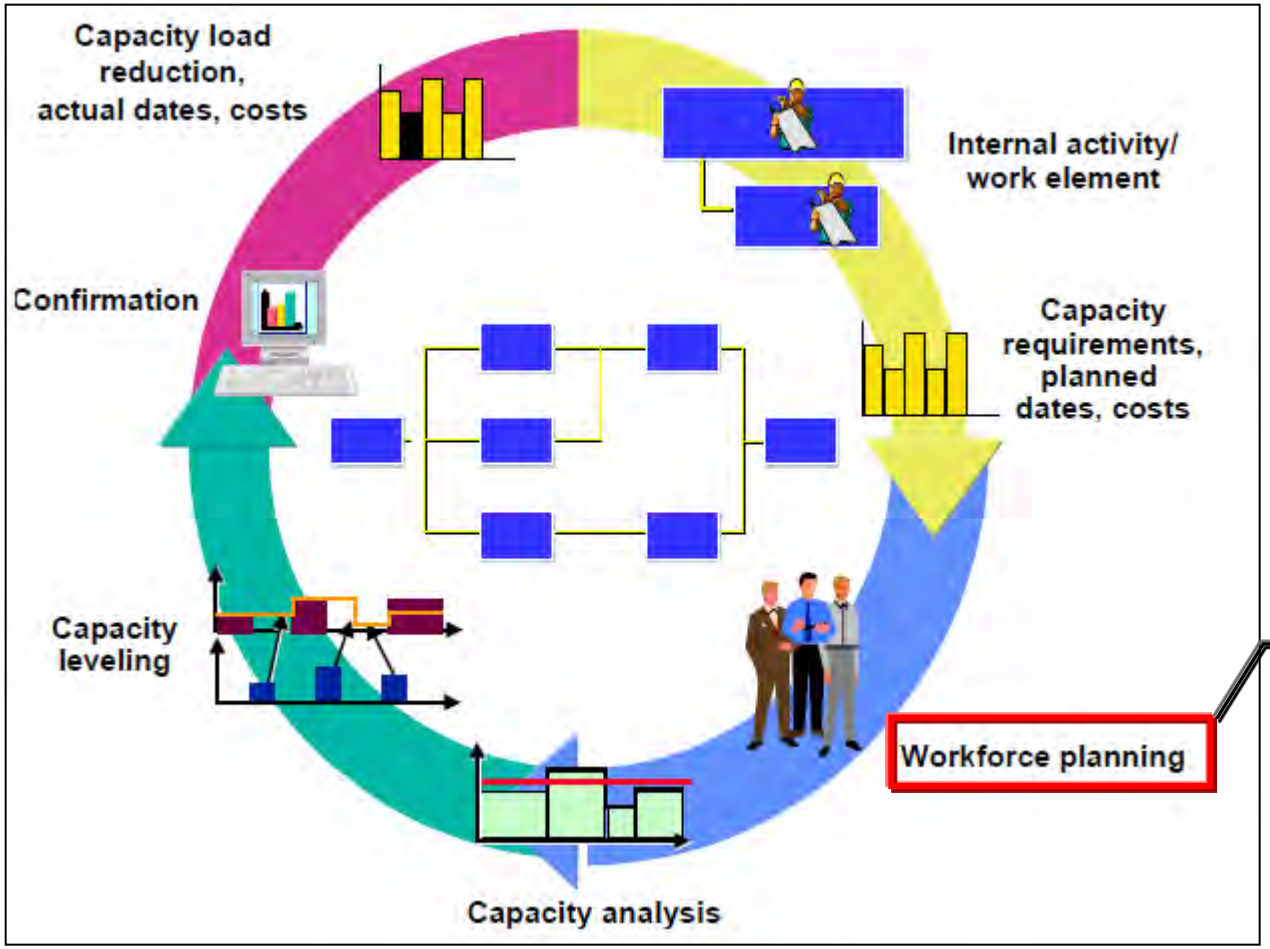
# SAP Functionality Gap




| | |
|---|---|
| **Geographic Information System (GIS)** | SAP has the ability to store fields that identify locations in a textual manner or to contain design images / pictures, but it **doesn't** have the ability to:<br>• Generate engineering designs for pipelines |
| **3D Modeling Tool (PlantSpace)** | SAP has the ability to store information related to the Stations, but it **doesn't** have the ability to:<br>• Create three dimensional designs (e.g. PlantSpace) |
| **Work Dispatching (Advantex)** | SAP has the ability to plan and release work to the workforce, but it **doesn't** have the ability to:<br>• Prioritize work based on level of urgency;<br>• Prioritize technician based on capabilities, inventory stored onboard the vehicle, and GPS location |

**The functionality provided by GIS, PlantSpace and Advantex will not be provided by SAP, resulting in the need for interfaces with these applications**

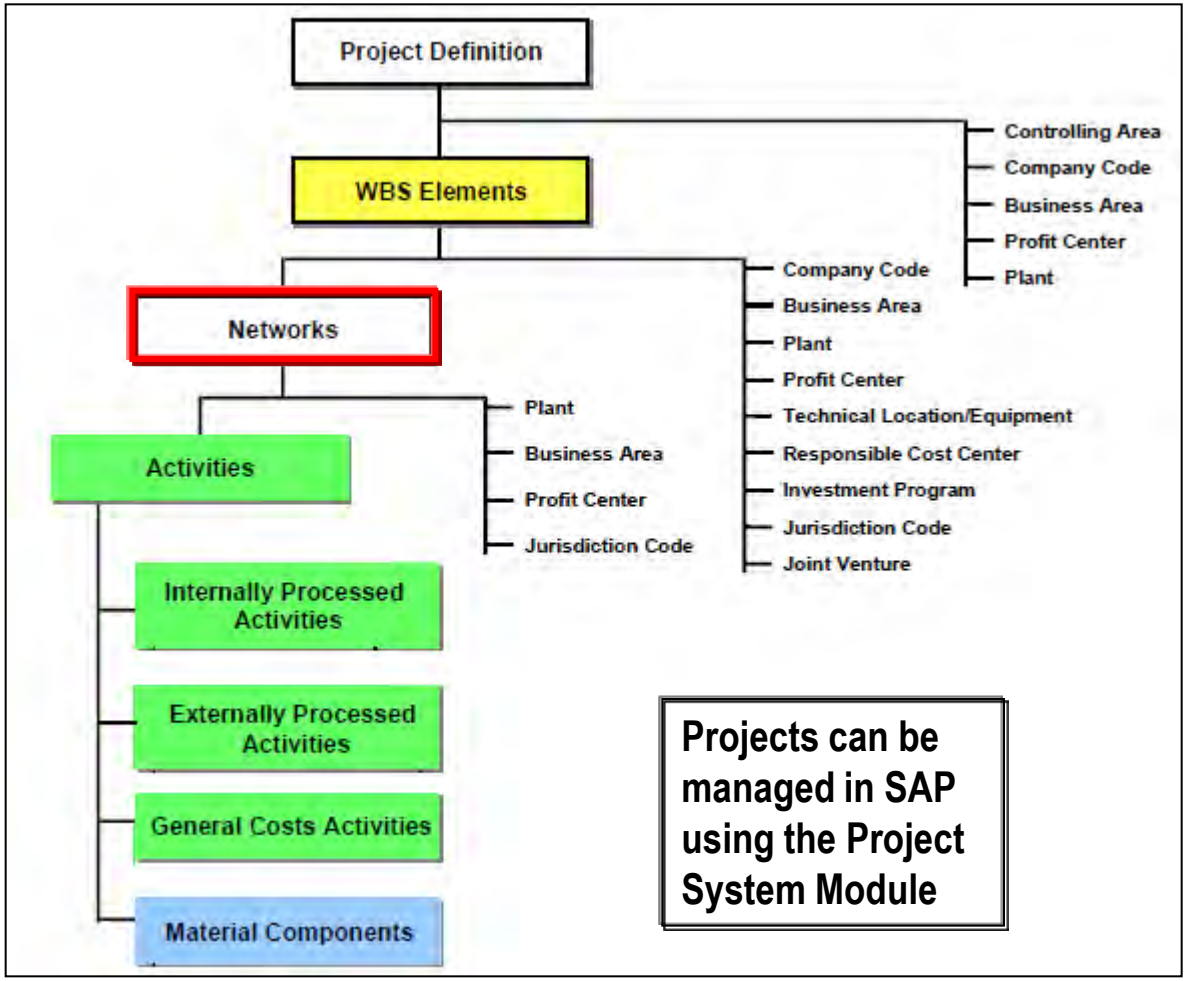
# SAP Functionality: In order to support workforce planning, Union Gas will need to implement the appropriate sub-module of SAP - HR




**Workforce planning is a sub module of Human Resource module.**
**It is integrated with Project system, CATS and Work centers.**

This function is used to distribute work in internally processed activities of a project to personnel resources according to periods.

# Additional SAP Functionality
# Project System (PS) Module - Project Management




**Projects can be managed in SAP using the Project System Module**

**Projects are structured by:**

- Structures, using a work breakdown structure (WBS)
- Process, using individual activities (work packages)

- Processes and sequences of tasks are planned with networks.

During the life of a project, networks are used as a basis for planning, analyzing, controlling and monitoring schedules, dates, and resources. such as personnel, machines, PRTs, materials, documents, and drawings.

**SAP provides additional functionality that Union Gas does not use today**

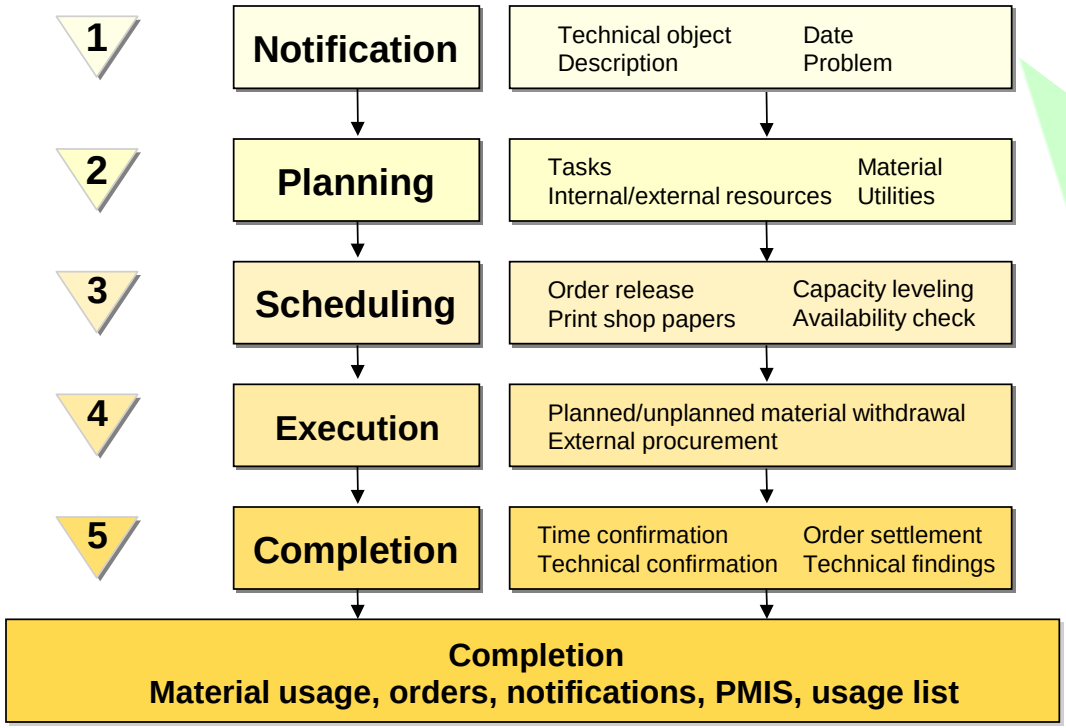
# The SAP Standard Plant Maintenance Process Model

The next few slides demonstrates how the functionality of the current applications is met by the SAP standard Plant Maintenance Process model at each stage of the maintenance process cycle

# SAP Standard Plant Maintenance Process Model meets Current Application Processes

1. Notification of a malfunction or request for a particular task

## SAP Plant Maintenance Process




## Current Application Processes

- **CARS:**
  - Notification is created when builder is requesting work.
- **MISOS:**
  - Notification is created when technicians send request to planning for USR to inspect station.
- **MAPCON**
  - When a problem is identified, Notification is created with problem description.
  - Work orders that are created based on Preventive maintenance do not require notification.

# SAP Standard Plant Maintenance Process Model meets Current Application Processes

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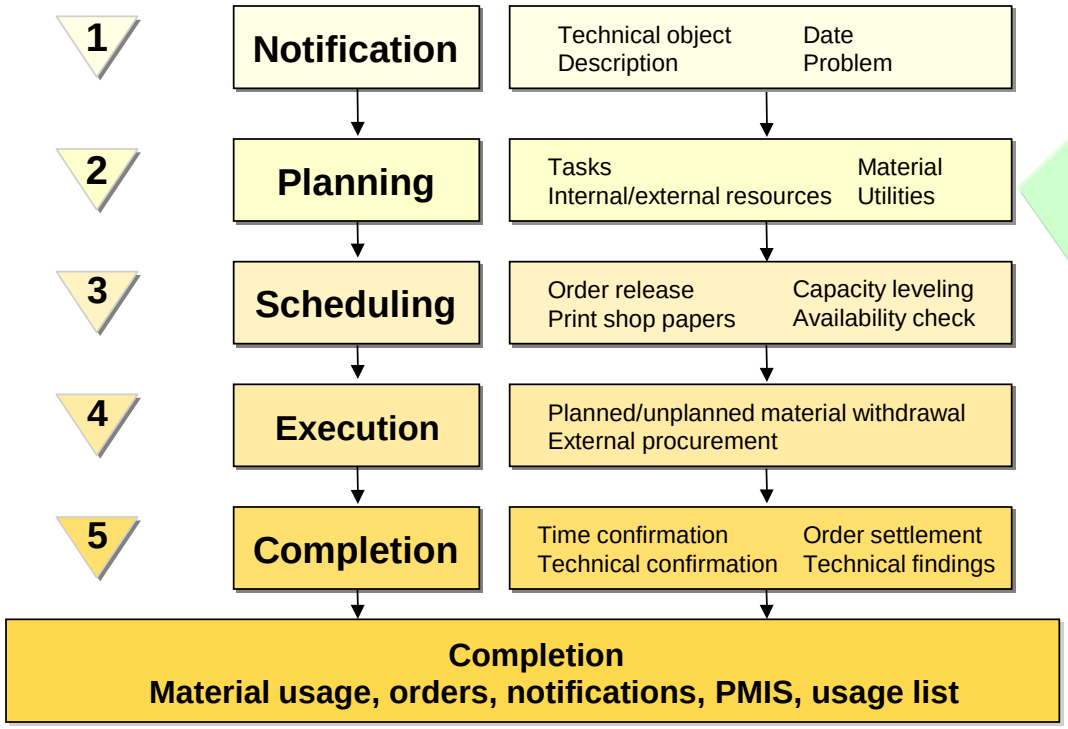
2. Creation and planning of an order based on notification or maintenace plan. Including creating operations, making reservations for parts, and planning execution times

## SAP Plant Maintenance Process



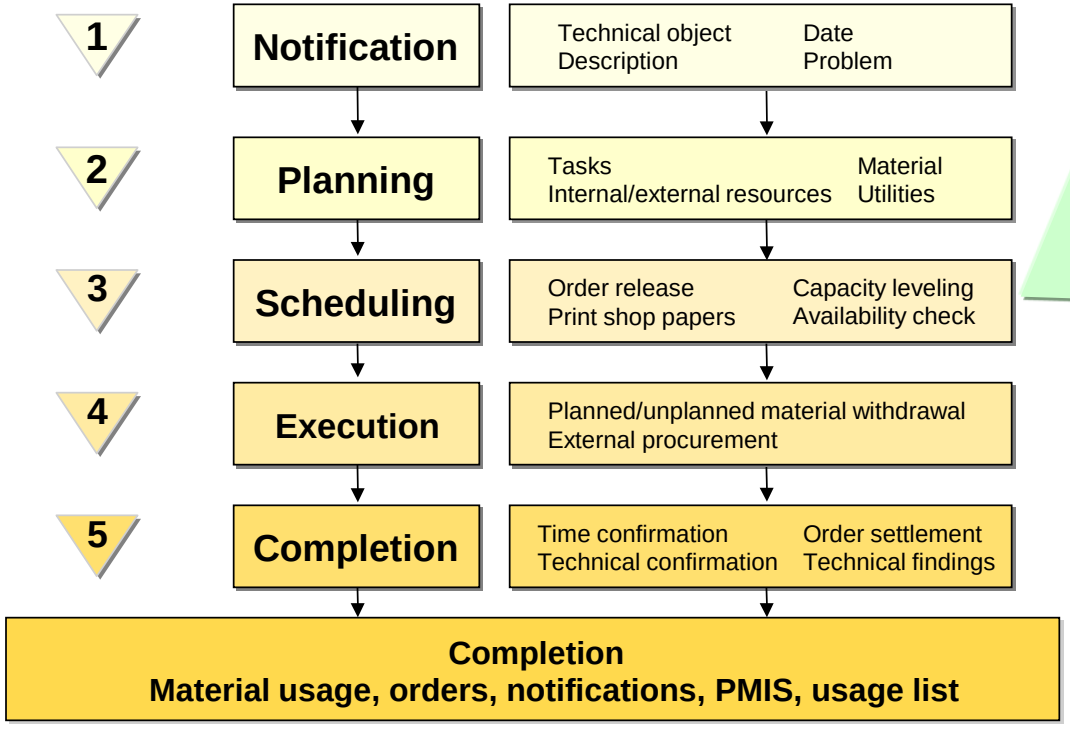

## Current Application Processes

- **CARS:**
  - Work orders created for Pressure test or installation.
  - Requirement for meters created from the work order.
- **MISOS:**
  - Work order is created to inspect station.
  - USR is responsible for carrying out the inspection.
- **MAPCON**
  - Work orders are created based on Preventive maintenance plan.
  - Activities and BOM are included in Work Order.

# SAP Standard Plant Maintenance Process Model meets Current Application Processes

3. Order scheduling and release with availability check, provision of capacity, printing of order papers

## SAP Plant Maintenance Process



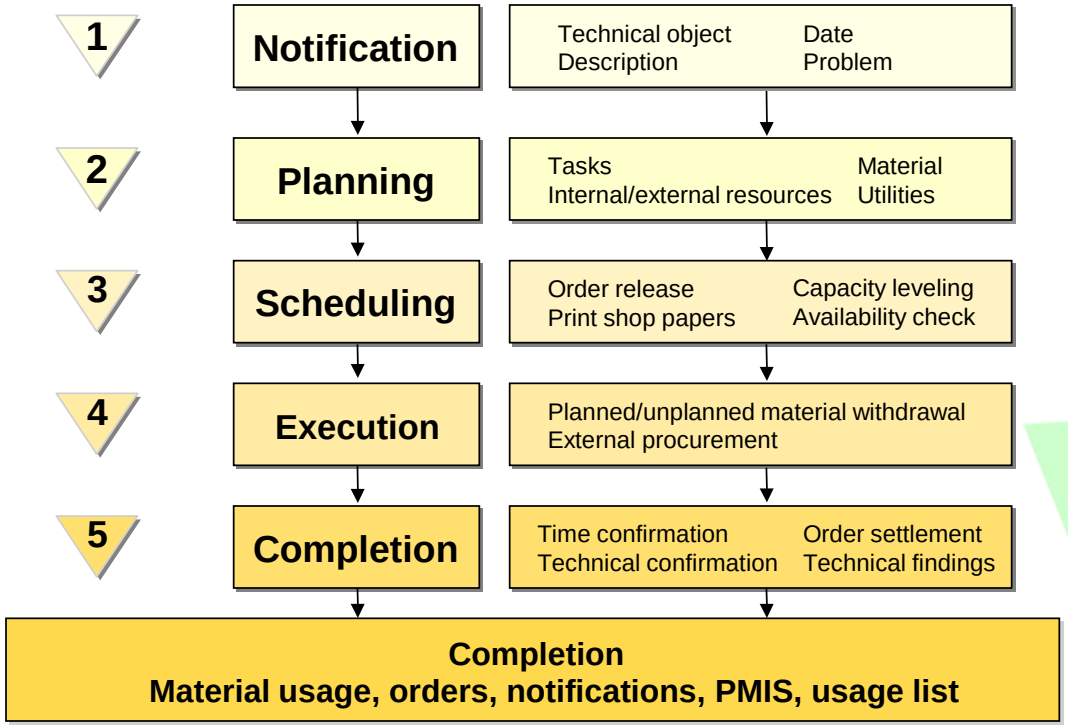

## Current Application Processes

- **CARS:**
  - When Work order is released, fax is send to builder to confirm request.
- **MISOS:**
  - Work Order is released (dispatched)
- **MAPCON:**
  - Work Order is released (dispatched)

# SAP Standard Plant Maintenance Process Model meets Current Application Processes

4. Actual execution of the work requested, including withdrawal of spare parts from the warehouse and execution of the order

## SAP Plant Maintenance Process



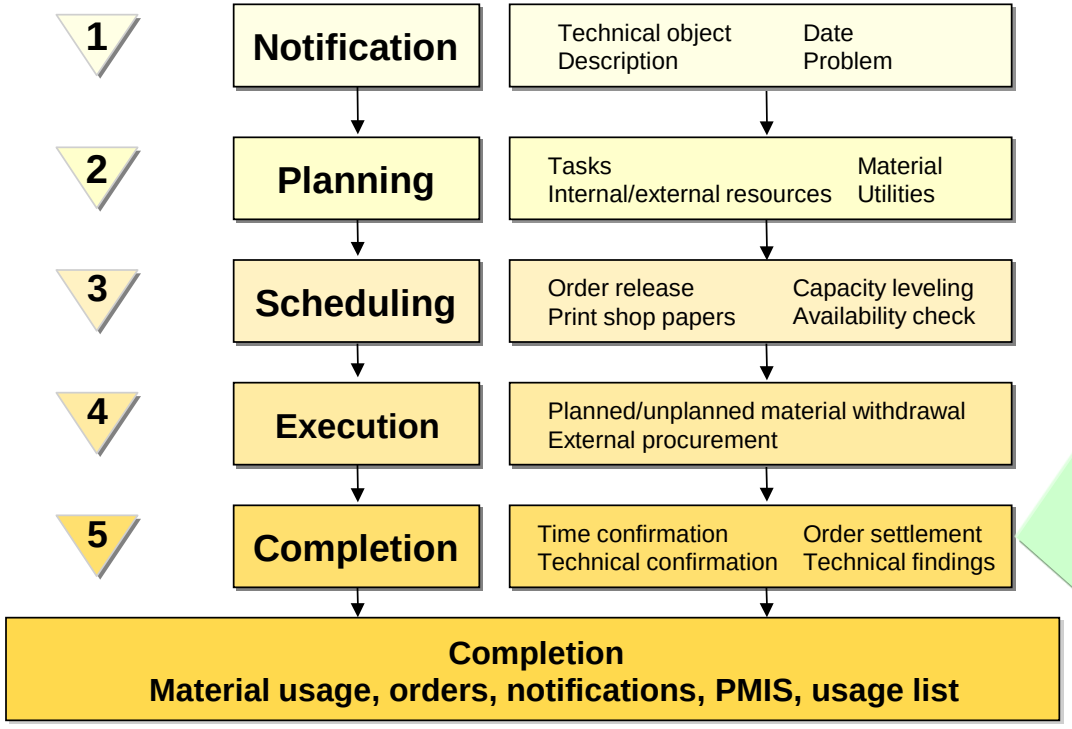

## Current Application Processes

- **CARS:**
  - Pressure test or installation is executed.
- **MISOS:**
  - Inspection is executed.
- **MAPCON**
  - Activities are executed.
  - Technician takes notes that can be scanned and attached to work order.

# SAP Standard Plant Maintenance Process Model meets Current Application Processes

5. Completion of the work actually executed, with technical findings. The order is settled in Controlling

## SAP Plant Maintenance Process




## Current Application Processes

- **CARS:**
  - Time is reported for one person or multiple people under one project using Cross Application Time Sheet functionality (CATS)
- **MISOS**
  - When inspection is completed, activities and time are confirmed in SAP.
  - Technician is notified through an automated email.
  - If required, Notification is created based on fault info from USR.
- **MAPCON**
  - Time is reported and activities confirmed using CATS or standard SAP confirmation.
  - Notes are scanned and attached to Orders.

# We recommend that Union Gas leverage SAP to provide a platform for end-to-end asset lifecycle management, from design to disposal

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# SAP ECC addresses the current technology issues and provides enhancements to currently available functionality

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| Current Technology Issues | SAP ECC |
|---|---|
| Master Data<br>Duplicate data in multiple applications<br>Non-Standard Asset definitions across the company<br>No central repository for Assets (GIS is working as a central repository, but is incomplete) | • Centralized Master Data Management (MDM) using SAP as central repository for Equipment, Functional locations and Activities. |
| Data entry<br>High level of manual data entry without verification or validation<br>Same information entered manually in multiple applications | • SAP provides verification and validation by field, process, document and user.<br>• Information will be entered once and if required, information will be shared with other applications via automatic interfaces without manual intervention. |
| Business process<br>Same business processes done differently due to different applications<br>There are no common asset management leading practices across the company<br>Lack of process integration | • Integrated maintenance process including maintenance planning, inventory management, purchasing, time / activity reporting and financial accounting<br>• Standardize Preventive Maintenance and Work Order Management throughout the company and provide ability to move to Predictive Maintenance<br>• Costs are tracked at multiple levels such as Equipment and Functional location level, Work order level and Cost object level (e.g. Cost centre, Capital Project, WBS elements, etc.)<br>• Planning is created at Equipment and Functional location level and Materials are integrated in the planning process as well as in the work order creation and execution |

# SAP ECC addresses the current technology issues and provides enhancements to currently available functionality

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| Current Technology Issues | SAP ECC |
|---|---|
| Application Maintenance.<br>Multiple support teams (Technical and Functional)<br>Current applications do not easily adapt to business changes or business requirements<br>Small changes require a complete IT project to be developed<br>Corrosion Register needs to be retired | • SAP PM simplifies the plant maintenance process reducing the administrative work load<br>• After Go-live, development and support is minimal. Changes can be done through configuration, and customization can be done using ABAP language, if required |
| Reporting.<br>Limited operating reports<br>Constrained management reports or business intelligence<br>No knowledge or solution database<br>Incomplete repair history<br>No issue tracking / No Root Cause Analysis / No problem management / No trend analysis | • Logistic Information System (LIS) is integrated with the logistics modules in SAP (including PM), generating standard reports<br>• SAP provides a Solution Database<br>• SAP allows tracking of Equipment and provides reports with drill down functionality to display different levels of detail and different views<br>• SAP-BW would empower users to generate their own reports on an *ad hoc* basis without IS intervention |

# SAP provides a wide variety of business centric benefits

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| Benefit Category | Benefits |
|---|---|
| Master Data Integration | • A single point of entry for Master Data<br>• Provides a unique repository for Master Data<br>• Data is entered once and can be used for all users based on their access profile |
| Leading Practices | • Leading industry practices are already introduced in the standard functionality<br>• Integration of plant maintenance processes including Planning, Scheduling, Execution and Confirmation<br>• Ability to plan materials and track costs at work order and equipment level.<br>• Easy access to data to make decisions related to equipment |
| Strategic Cost | • Cost advantages gained through more efficient system |
| Application Integration | • Seamless integration between accounting and logistic processes<br>• Standardized business process<br>• Shorter lead time for business process<br>• Plant maintenance is integrated with Finance, Controlling, Project Systems, HR, Material Management and Asset Accounting |

# SAP provides a wide variety of business centric benefits

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| Benefit Category | Benefits |
|---|---|
| Flexibility | • Can be adapted to local deregulation rules (from classic utility company to Generation / Transmission / Distribution / Sales)<br>• Can be adapted to fulfill specific company requirements<br>• Can be implemented in all types of industry, including Utilities<br>• Enables development of individual business strategy<br>• After an initial set up, processes can be adapted without requiring a major development project |
| Customer Orientation | • User friendly<br>• Oriented to business processes |
| Maintenance Integration | • Maintenance planning<br>• Inventory management<br>• Time and activity reporting<br>• Financial Accounting |
| Standardized Practices | • Standardized enterprise-wide preventive maintenance and work order management |

# SAP provides a wide variety of business centric benefits

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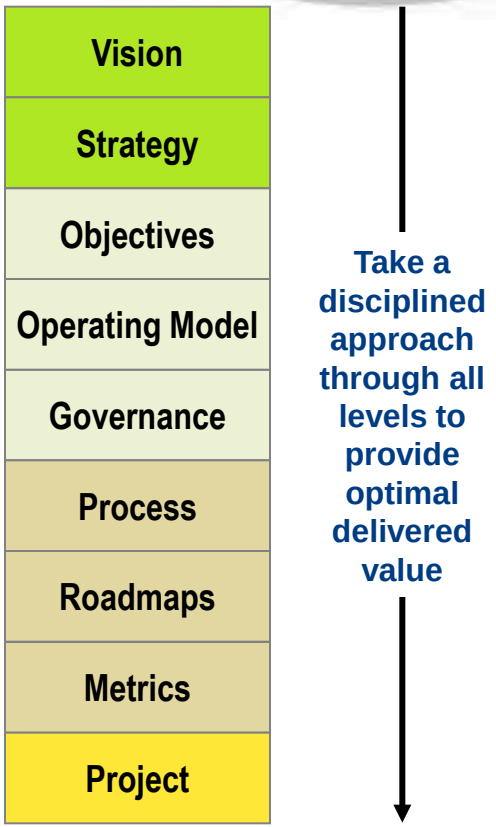
| Benefit Category | Benefits |
|---|---|
| Effective Cost Tracking | • Costs tracked at multiple levels:<br>  • Equipment<br>  • Functional locations<br>  • Work order<br>  • Cost object (e.g. cost center, capital project, work breakdown structure (WBS) elements, etc.) |
| Simplified Reporting | • Logistics Information System (LIS) for generating standard reports is integrated with SAP's logistics modules<br>• SAP-BW is a business intelligence tool that allows users to make their own *ad hoc* reports without the assistance of Information Services (IS) |

**These benefits will provide Union Gas with an asset management program characterized by asset effectiveness, cost avoidance, process simplification, cost savings and productivity gains.**

# Recommendations

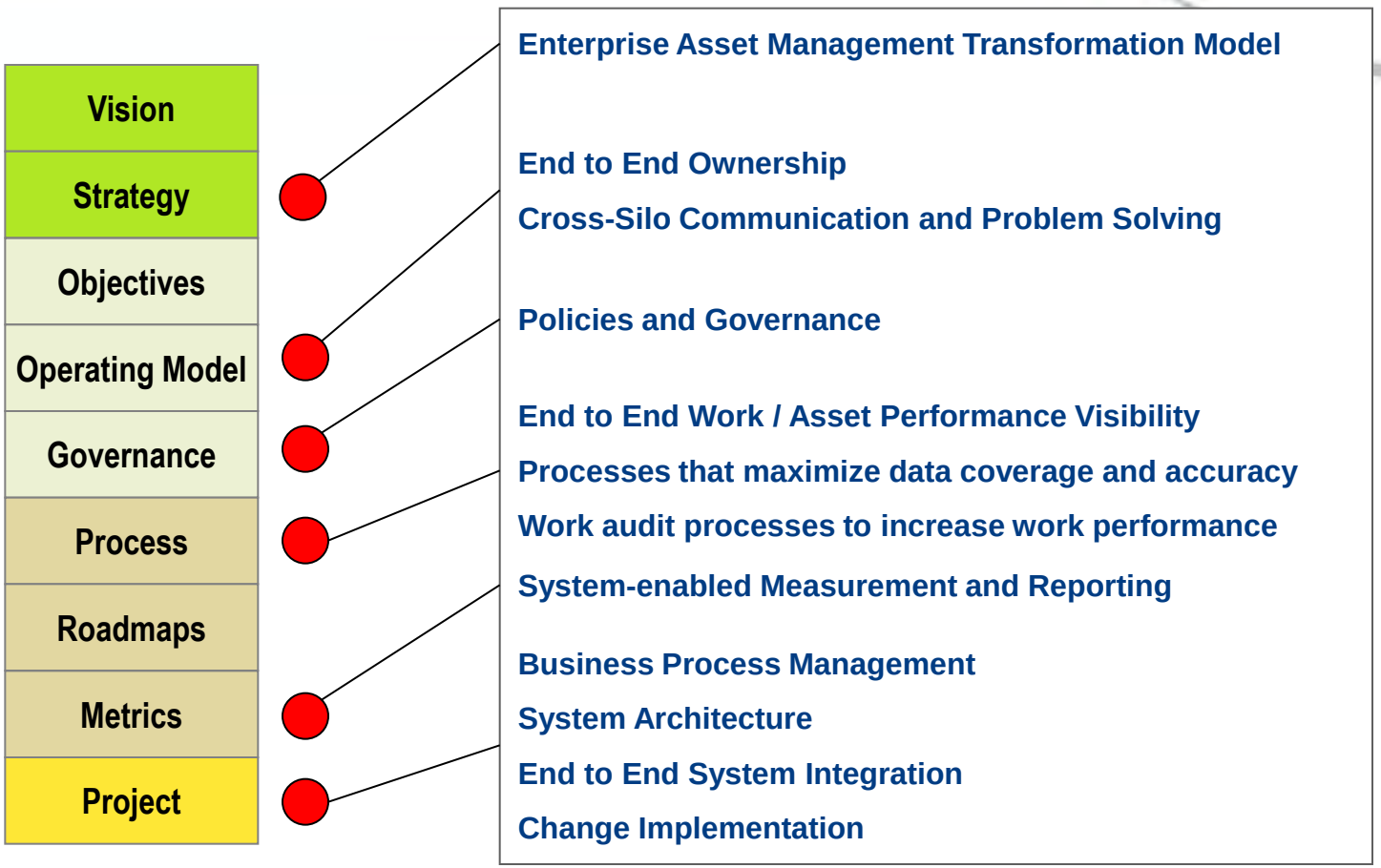
# We recommend completing a full asset management transformation based on the approach shown below

- Transform the asset management program using the approach shown at the right
  - Start with a Vision and Strategy for the end-to-end EAM program defined by the senior executive
  - Develop objectives, an operating model and a governance structure
  - Design EAM processes starting with the Operating Model and working through a structured, gated approach that produces processes that crosses organizational boundaries
  - Develop metrics that align with the processes
  - Create an implementation roadmap that defines the sequence of process and metric implementation
  - Transform the EAM program by implementing the new processes




**This approach aligns the asset management program with corporate strategy and direction, encompasses the end-to-end process and provides context for working level personnel**

# The recommended transformation approach addresses issues that were identified during this strategy assessment engagement




**This proven approach to business transformation will increase the probability of successfully moving the organization to a new paradigm for asset management starting with a vision**

# Some interfacing will be required to provide Union Gas with full asset management functionality, but we highly recommend the use of a Business Intelligence tool

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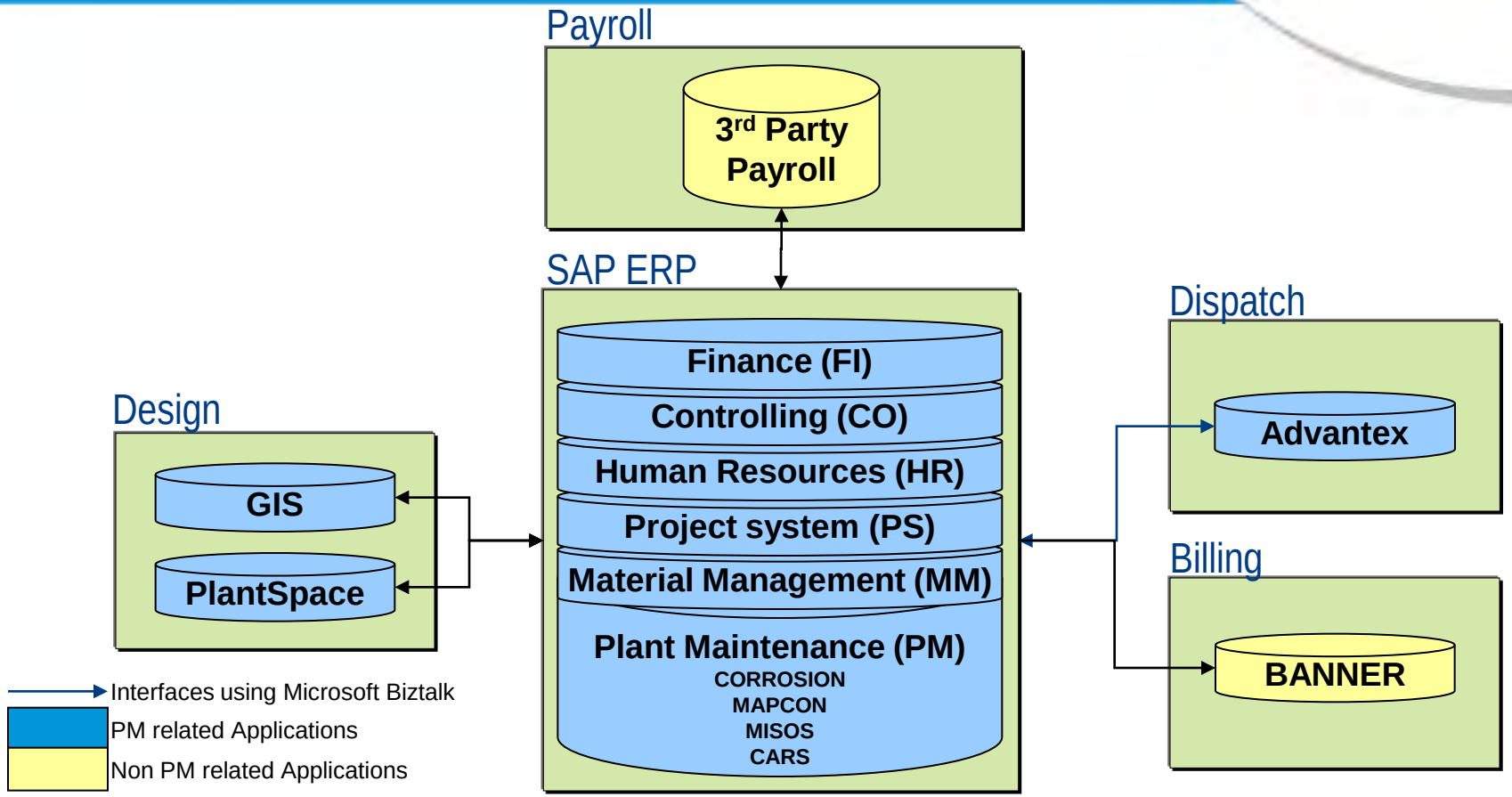
1. Multiple applications running similar processes should be eliminated to avoid redundancy
   - MISOS, MAPCON and CARS are all work order management applications
2. SAP will act as an Asset Master Data Central Repository
   - GIS is currently used as central repository for pipelines
3. GIS should be seamlessly integrated with SAP
   - GIS could be fully integrated with SAP allowing GIS users to display and update SAP Equipment master data directly in GIS and SAP users will be able to display maps for specific equipment from SAP Master Data or Work Orders
4. SCADA and Foxboro system should be interfaced with SAP to create Work Order Request automatically based on exceptions reports
5. Once operational applications have been integrated using SAP and GIS, a Strategic reporting tool such as Business Intelligence, for financial and business analysis, should be implemented

**In order to derive value of the reporting functionality and ease of report development (without IS intervention), we recommend consideration of SAP-BW as a Business Intelligence Tool**

# SAP provides a streamlined architecture that minimizes the number of interfaces with other applications, providing a single view of the truth




**A single data repository and reporting tool with minimal interfaces can provide the enhanced functionality required for a successful asset management program with reduced long term maintenance costs**

# The future asset management application topology matrix highlights the reduction in complexity as a result of implementing SAP

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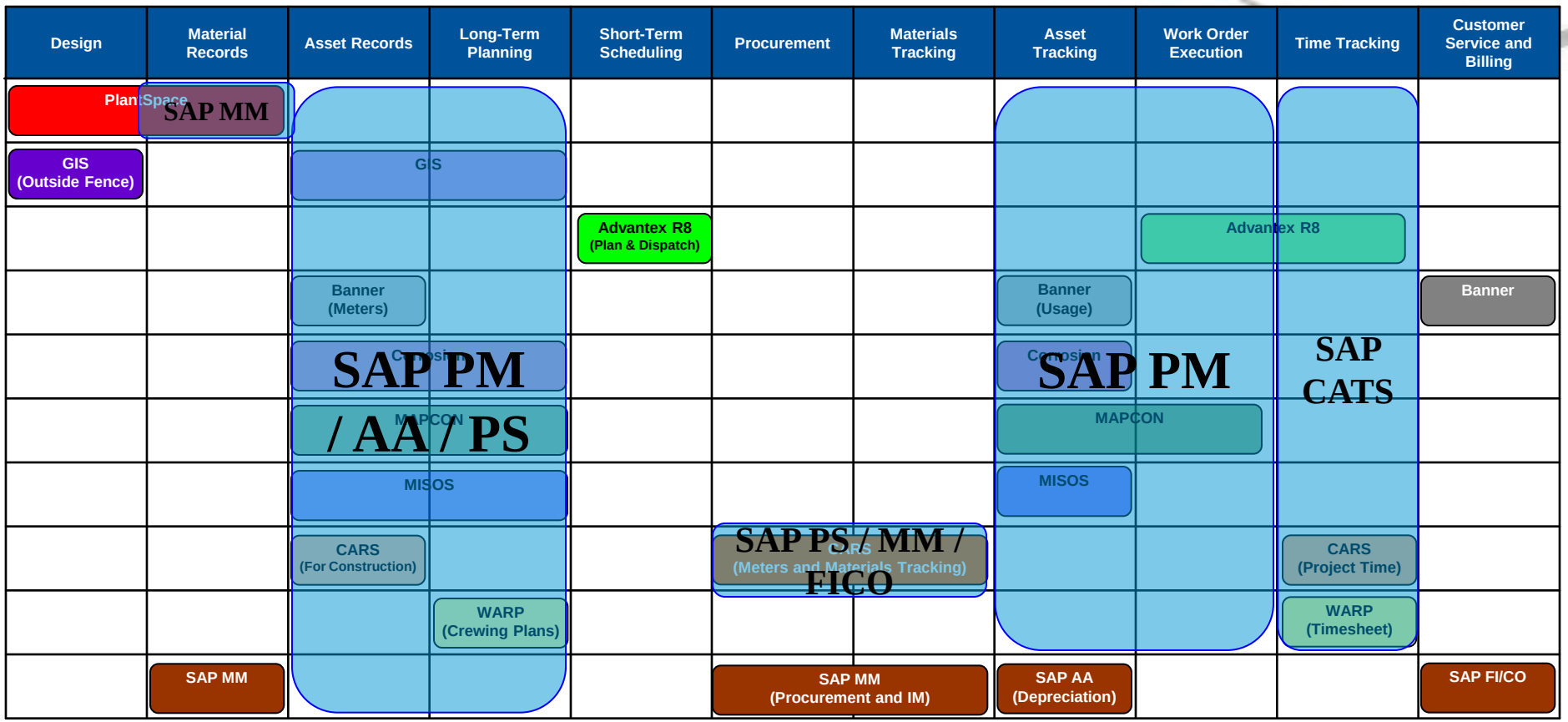
| Design | Material Records | Asset Records | Long-Term Planning | Short-Term Scheduling | Procurement | Materials Tracking | Asset Tracking | Work Order Execution | Time Tracking | Customer Service and Billing |
|---|---|---|---|---|---|---|---|---|---|---|
| PlantSpace | | | | | | | | | | |
| GIS (Outside Fence) | | GIS | | | | | | | | |
| | | | | Advantex R8 (Plan & Dispatch) | | | | Advantex R8 | | |
| | | Banner (Meters) | | | | | Banner (Usage) | | | Banner |
| | | Corrosion | | | | | Corrosion | | | |
| | | MAPCON | | | | | MAPCON | | | |
| | | MISOS | | | | | MISOS | | | |
| | | CARS (For Construction) | | | CARS (Meters and Materials Tracking) | | | | CARS (Project Time) | |
| | | | WARP (Crewing Plans) | | | | | | WARP (Timesheet) | |
| | SAP MM | | | | SAP MM (Procurement and IM) | | SAP AA (Depreciation) | | | SAP FI/CO |

**Maximizing application consolidation into a single application or ERP would reduce the application maintenance and administration costs and simplify user training and data integrity management**

# The future asset management application topology matrix highlights the reduction in complexity as a result of implementing SAP




**Maximizing application consolidation into a single application or ERP would reduce the application maintenance and administration costs and simplify user training and data integrity management**

# The future asset management application topology matrix highlights the reduction in complexity as a result of implementing SAP

| Design | Material Records | Asset Records | Long-Term Planning | Short-Term Scheduling | Procurement | Materials Tracking | Asset Tracking | Work Order Execution | Time Tracking | Customer Service and Billing |
|---|---|---|---|---|---|---|---|---|---|---|
| PlantSpace | | | | | | | | | | |
| GIS (Outside Fence) | | | | | | | | | | |
| | | | | Advantex R8 (Plan & Dispatch) | | | | | | |
| | | | | | | | | | | Banner |
| | SAP | | | | SAP | | | | | |

**Maximizing application consolidation into a single application or ERP would reduce the application maintenance and administration costs and simplify user training and data integrity management**

# SAP will reduce the number of interfaces from 13 to 5

| Application | Payroll | SAP | Advantex | WARP | Banner | GIS |
|---|---|---|---|---|---|---|
| Advantex | | √ | | | | |
| GIS | | √ | | | | |
| PlantSpace | | √ | | | | |
| SAP | √ | | | | √ | |

- SAP will become the central application that interfaces with other applications
- The number of interfaces are reduced from the current 13 to 5

**Reducing the quantity of interfaces will reduce the long term maintenance costs of the EAM application by simplifying application upgrades**

# The recommended asset management transformation will provide many benefits for Union Gas

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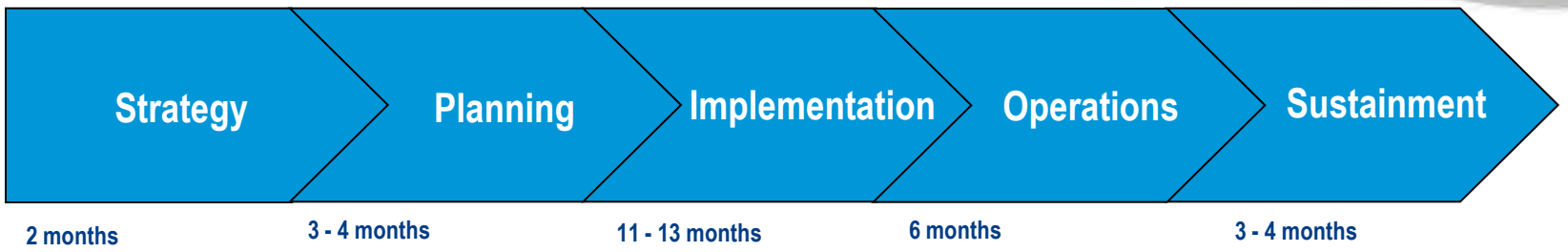
- Benefits of transforming the asset management program include:
  - Standardized master data and a plan to complete the data records and to improve accuracy
  - Re-designed processes that will:
    - Cross organizational boundaries;
    - Be consistent with the overall business direction and a corporate asset management strategy
    - Provide context to stakeholders
    - Streamline work in association with SAP
  - A single source of the truth and streamlined application architecture that will:
    - Reduce long term maintenance costs;
    - Simplify asset and work reporting and analysis;
    - Enhance the functionality provided by the current generation of custom asset management applications
    - Provide a key tool for reducing the impact of the impending technician retirement trend
  - A change management program that will:
    - Communicate the new program to all stakeholders
    - Train personnel who will use the new tools in their job assignments
    - Facilitate the acceptance of the new tools

**The recommended transformation will make it possible for technicians to become more productive**

# Implementation

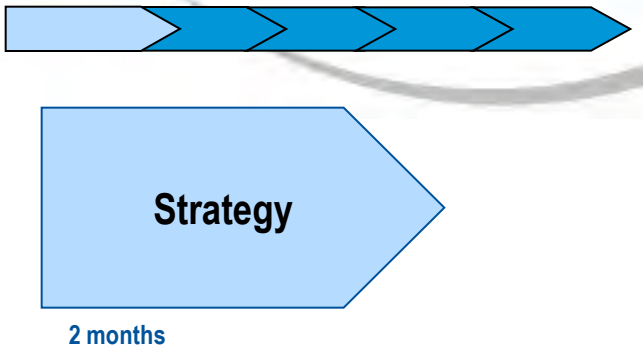
# Staged implementation of SAP EAM Foundation




- The approach encompasses five (5) stages:
  - Strategy;
  - Planning;
  - Implementation;
  - Operations and
  - Sustainment
- Each stage builds on the previous stage to provide Union Gas with a sustainable Enterprise Asset Management program

**A five-step implementation program toward world-class asset management**

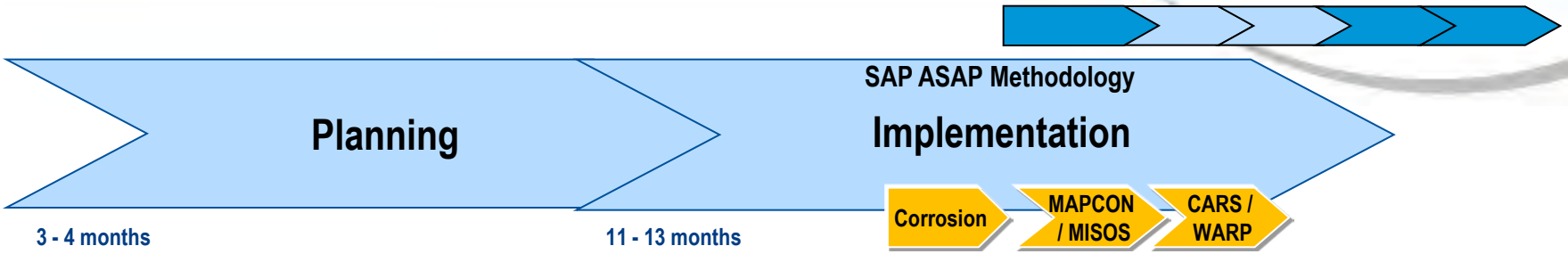
# Stage 1: Strategy




- Develop an asset management strategy
  - Purpose;
  - Vision;
  - Mission Statement;
  - Goals and Objectives; and
  - Governance Structure
- Defined by executives facilitated by EAM expertise
- Workshop format:
  - Start with corporate mission, vision, and values
  - Establish current EAM position
  - Generate EAM strategy alternatives
  - Select appropriate alternative
  - Define critical performance drivers, action plans and measures
  - Provide a governance structure that will increase the sustainability of success

**Develop a strategy to lead the enterprise asset management (EAM) transformation at Union Gas**

# Stages 2 and 3: Planning and Implementation



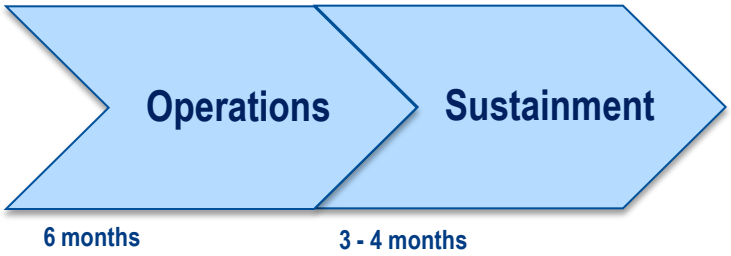

- Re-design end-to-end EAM processes
- Define EAM Master Data Standards
- Identify and scope EAM metrics and reporting requirements and prioritize into an implementation roadmap
- Define reports that will be necessary to effectively manage the asset bases
- Evaluate application interfaces
- Assess hardware requirements
- Develop a Change Management Plan for the EAM Program Transformation
- Blueprint Approval

- Convert current EAM system functionality into SAP in the following sequence:
  - Corrosion Register
  - MAPCON / MISOS
  - CARS / WARP
- Corrosion first due to mature technology
- MAPCON second due to impact of an asset failure and the need for a fully developed asset management program / application
- MISOS has similar functionality to MAPCON, so should occur at the same time
- CARS is has the most complex functionality and largest number of interfaces, so it should be converted last
- WARP has some similar functionality with CARS, so should be converted at the same time


**EAM Transformation Implementation will be completed in 16 to 19 months**

# Stages 4 and 5: Operations and Sustainment

- Approximately 6 months after the SAP implementation a sustainment stage is recommended to leverage an improved asset management foundation consisting of:
  - Improved data integrity;
  - Increased process compliance with new processes; and
  - Expanded measurement and reporting capabilities
- The sustainment stage will take advantage of the improved asset management foundation to assist Union Gas move toward its end goals, which might include:
  - Asset Investment Planning (AIP)
  - Maintenance Continuous Improvement
  - Inventory Optimization
  - Mobile Field Computing Technologies
  - Enterprise Portal Tools




**The sustainment stage will leverage the transformed asset management program and set Union Gas on a course to achieve the goals and objectives set in Step 1: Strategy**

# A detailed review of SAP's ASAP Implementation Methodology

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| 1. Project Preparation | 2. Business Blueprint | 3. Realization | 4. Final Preparation | 5. Go live and Support |
|---|---|---|---|---|
| • Define your project goals and objectives<br>• Clarify the scope of your implementation<br>• Define your project schedule, budget plan, and implementation sequence<br>• Establish the project organization and relevant committees and assign resources | • **AS IS**: Understanding the business process.<br>• **TO BE**: mapping of business process based on business changes recommendations and SAP functionality.<br>• **GAP Analysis**: define inputs or business process that cannot be mapped into standard SAP. | • Implementation (configuration) of Business process requirements based on the Business blueprint.<br>• Create Technical specification for each GAP and develop programs:<br>➢ Forms<br>➢ Reports<br>➢ Interfaces<br>➢ Enhancements<br>➢ Workflows | • Unit testing<br>• Integration testing<br>• User acceptance testing.<br>• Training: Training will be done using train the trainee approach.<br>• Cut over period includes:<br>➢ Transport Configuration to production environment.<br>➢ Transport programs to production environment.<br>➢ Prepare and migrate master data to Production.<br>➢ Define and execute strategy for Open documents. | • Setting up production support.<br>• Monitoring system transactions.<br>• Monitor overall system performance.<br>• After Go live, system is kept under monitoring for support for a small period of time. |

# Master Data Management will also benefit from the use of SAP's ASAP Methodology

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| 1. Project Preparation | 2. Business Blueprint | 3. Realization | 4. Final Preparation | 5. Go live and Support |
|---|---|---|---|---|
| **Identify sources of Master Data.**<br>• Current sources: Corrosion, GIS, PlantSpace, CARS, MISOS and MAPCON<br>• Future Source: SAP PM<br>**Identify Customers of Master Data**<br>• GIS, PlantSpace, Advantex and Banner<br>**Assemble a team including business users and IT representatives.**<br>• Business users from all current Master Data sources should be included.<br>**Create a Data governance committee**<br>• Group with knowledge and authority to take decisions about master data | **Collect and analyze master data**<br>• For the sources, identify attributes including name, type, allowed values, constraints, default values and dependencies.<br>• Identify ownership for definition and maintenance.<br>**Develop a new master data model**<br>• Master data model should include Standard definitions and structures, and in a lower level attributes and values.<br>• New model should be mapped to SAP | **Generate Master Data**<br>• This step includes cleaning up master data and consistency checks.<br>Update systems<br>• Adjust Interfaces and fields as required. | **Test Master Data**<br>• Upload Master data and test creation, modifications and synchronization when multiple applications are involved. | **Upload and follow up**<br>• Upload master data and implement Master Data Management process. |

# Implementation Business Case

# Tangible Benefits of an Integrated EAM Solution*

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| Tangible Benefits | Enabler | % impact |
|---|---|---|
| **Revenue** | | |
| ▪ Increase production | Reduction in overall plant/equipment downtime | 2-3% |
| ▪ Improve schedule attainment | Faster reaction to unplanned events | 15-20% |
| **Operating cost** | | |
| ▪ Increase maintenance productivity | Better planned maintenance projects | 10-15% |
| ▪ Reduced overtime | Faster repair cycle time | 20-25% |
| ▪ Reduced emergency purchases | Better inventory planning for parts and tools | 25-30% |
| ▪ Better pricing from vendors | On time payments, better leveraged buying | 15-20% |
| ▪ Increase planning/budgeting efficiency | Automated tools and better data availability | 30-40% |
| **Working capital requirement** | | |
| ▪ Improved equipment availability | Better maintained equipment | 5-10% |
| ▪ Reduce excess inventory | Effective inventory planning | 15-20% |
| ▪ Faster repair cycles | Better availability and visibility of parts and tools | 20-30% |

*** Source: SAP Value Engineering – Typical SAP EAM**

# Strategic Benefits of an Integrated EAM Solution

- Meet increasing compliance and regulatory requirements.
- Develop and implement new assets or facilities in a cost effective manner.
- Reduce maintenance expenditures to raise company profits
- Better management of capital expenditures
- Safe working environment with standard work processes across the plants, facilities or assets.
- Increase ROA – Return on Assets – through timely, accurate information and powerful reporting and analytics

# Asset information transformation throughout the asset lifecycle – Capital and Operating Expense savings

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## Asset Planning through Installation / Commissioning

**Engineering context data = 80%**
Engineering / Procurement / Project Control / OEM Data

**Procurement context data = 20%**
Hand-over EPC / GL Account / Cost Data

Tags, Drawings, Specifications
Manuals, BOMs

## Operation & Maintenance

**As Maintained context data = 70%**
Derived from Procedures / Practices / Expert Systems

**As Built Context = 30%**
Configuration / Maintenance Program Data

*Design / Project Focus*

Projects delivered safer, better, faster, cheaper

*Operate / Maintain Focus*

Improves asset integrity - maintenance and supply chain processes

*Reliability / Performance Focus*

Drives asset performance, reliability & continuous improvement

### Capital Expense Benefits

Schedule plus cost savings of up to 1.5% of capital cost

### Operating Expense Benefits

Reliability plus productivity benefits of $1-5 million / yr for every $1 billion of assets

# The recommended asset management transformation would provide many benefits for Union Gas

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Summary level benefits associated with the recommended asset management transformation include:

- Increased technician productivity
- Decreased long-term application maintenance costs
- Increased asset useful life
- Decreased funding requirements for capital asset replacement
- Decreased potential for asset failures
- Enabled ability to leverage industry and asset management leading practices (like Reliability Centered Maintenance or RCM)

**We believe that Union Gas should gain 15% to 20% cost improvement from an Asset Management Transformation**

# Cost

- The recommended asset management transformation includes:
  - A phased approach that:
    - Reduces the amount of change being experienced at one time
    - Decreases the implementation risk
    - Leverages resource sharing by implementing more than one application at a time
  - A planning phase that prepares for the SAP implementation by:
    - Standardizing enterprise-wide asset management master data
    - Re-designing asset management processes to:
      - Align with overall corporate direction
      - Provide end-to-end lifecycle management coordination
      - Provide context to stakeholders
    - Defines reporting requirements
    - Assesses and plans hardware and interfacing requirements
  - A streamlined schedule that accomplishes the transformation within 16 to 19 months*
  - A rough-order-of-magnitude (ROM) cost of $5 million to $5.5 million*

* - does not include the Strategy or Sustainment Transformation Stages

**A complete asset management transformation for between $5 million and $5.5 million over 16 to 19 months**

# Next Steps

# Next Steps

- Review and digest the content of this final deliverable document
- Provide comments, suggestions and questions about the content of this document
- Discuss, finalize and accept this final deliverable document
- Prepare the final presentation for 17 September


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FOR THE ENERGY IN YOU

# Appendix 1

SAP EAM Case Studies

# One of the world's largest electrical utilities

- Project Objectives
  - Update the organization's information systems to improve business processes, boost efficiency, and control costs in a deregulated environment
  - Provide tighter integration across the enterprise, including finance and accounting, purchasing, material management, project management, and work management
  - Streamline enterprise asset management processes
- Key Challenges
  - Improve asset utilization and performance
  - Increase operational efficiency
  - Control costs

- Key Benefits
  - Streamlined processes to increase business performance
  - Faster execution times
  - Improved monitoring of critical performance metrics
  - A fully integrated system with no data redundancies
  - More effective financial and audit control capabilities
  - Positioned to take advantage of future initiatives.
- Implementation Highlights
  - Implementation of a fully integrated Enterprise Resource Planning (ERP) system across the enterprise
  - Asset management focused solutions included: work clearance management, shutdown management, maintenance budget control, cost control for projects/investments/assets, transmission outage planning and control, breakdown and downtime analysis

**Source: SAP Value Engineering**

# One of the top US oil refining companies

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- Project Objectives
  - Consistent, streamlined processes for enterprise asset management across network of 15 refineries
  - Maximize asset utilization
  - Minimize operating expenses related to maintenance
  - Improved visibility of maintenance activities for better business planning and decision support
- Key Challenges
  - Disparate legacy and point solutions across facilities
  - Lack of visibility to projected workload and costs for project and maintenance work
  - Cost-effective conversion of acquired facilities

- Key Benefits
  - Increased productivity from automated maintenance work order processing
  - Reduction in parts inventory costs through integration of maintenance activities with parts management and purchasing functions
  - Improved quality of overall work processes, and cost savings from avoiding errors and rework
  - Improved business planning and decision support from visibility into planned and actual maintenance activities and costs
  - Ability to rapidly and cost-effectively convert acquired facilities to the global maintenance system
- Implementation Highlights
  - Initially, SAP systems were implemented into four plants in six months
  - Real-time visibility to maintenance data and costs
  - Effective tracking of >450,000 pieces of equipment
  - 1,000 work orders processed per day

**Source: SAP Value Engineering**

# A large global oil and gas exploration, development and production company

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- Project Objectives
  - Improve equipment and process reliability
  - Decrease deferred production relative to business plan
  - Increase operating efficiency to reduce costs
  - Integrate maintenance and production improvement initiatives
- Key Challenges
  - Further improving competitive advantage in operating cost
  - Anticipated high rate of hourly worker retirement
  - Difficulty instituting disciplined work processes with clear accountability
- Key Benefits
  - Labor utilization increased 20%
  - Schedule attainment increased 18%
  - Deferred production reduced from 10.3% to 6.4%
  - Reactive work decreased 6%
  - Cost reduction through efficiency improvement
- Implementation Highlights
  - Full integration of maintenance and production
  - Support for timely decisions based on real-time data

**Source: SAP Value Engineering**

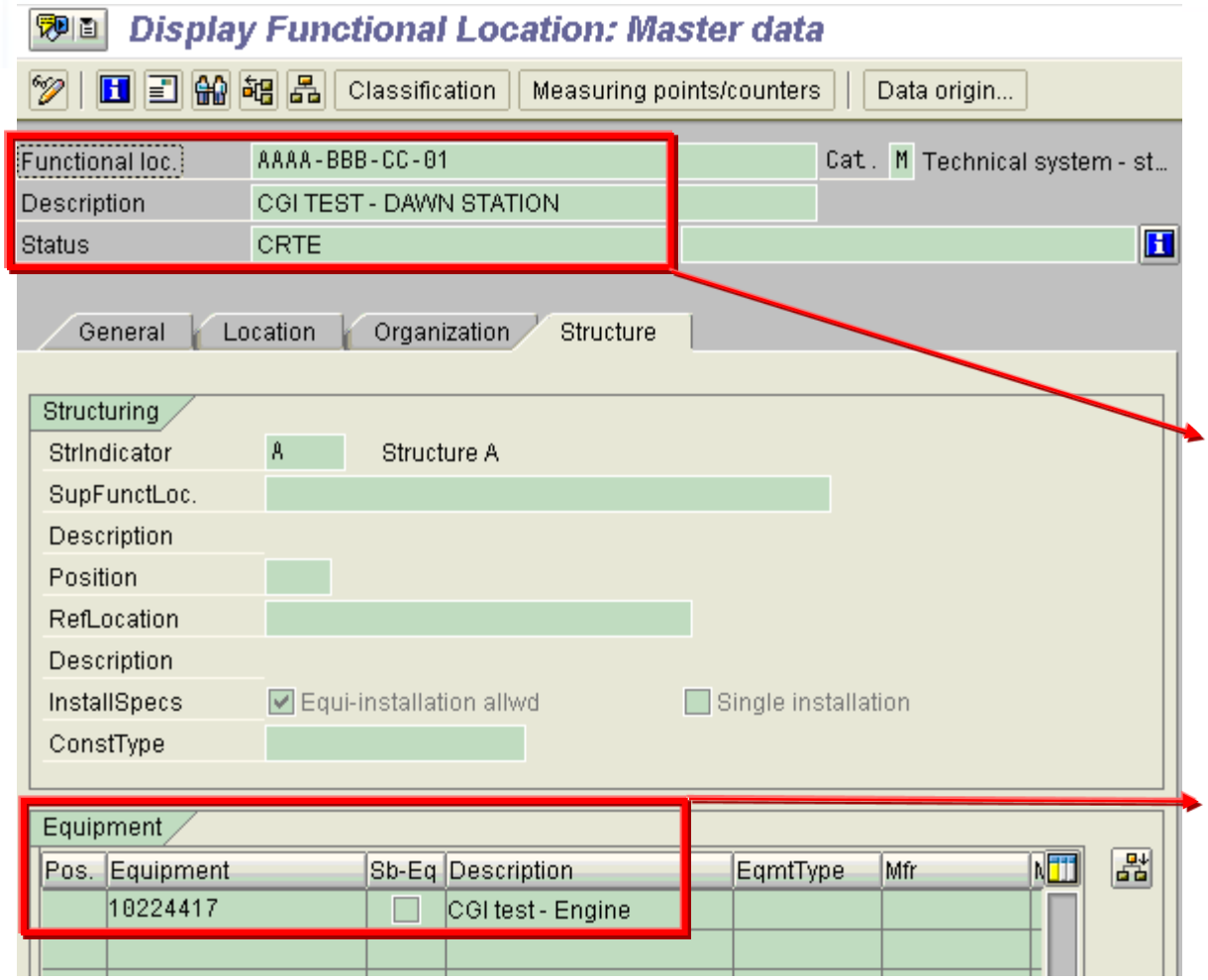
# Appendix 2

EAM System Requirements and SAP Accomplishes Them

# EAM System Requirements

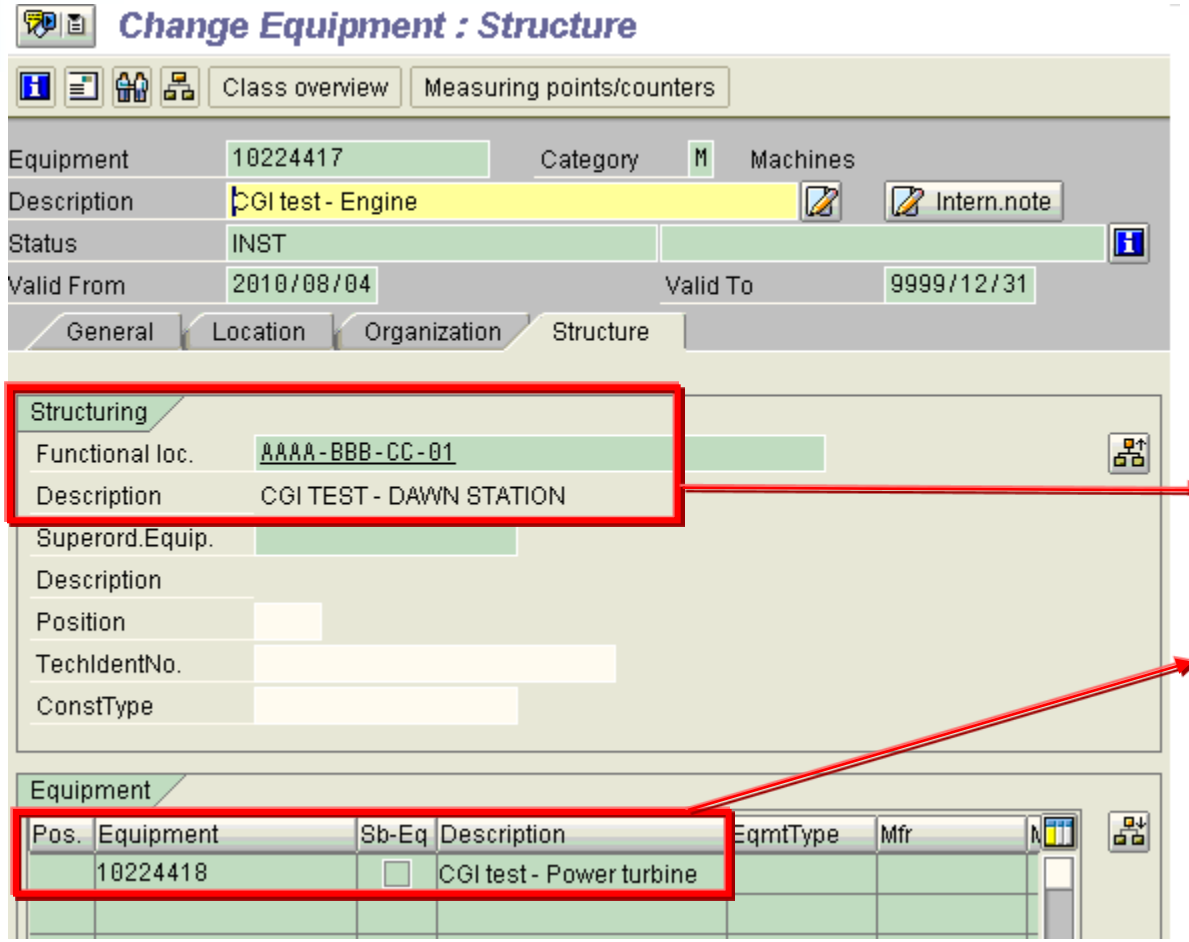
- Data repository of asset records
  - Equipment register
  - Asset register
  - Class and Classifications (specifications)
- Managing the assets through integrated processes that encompass the entire end-to-end life of these assets
  - Supply chain processes
  - Work management
  - Planning & scheduling
  - Work execution and completion
  - Costing
  - Bills of Material (BOMs)
- Reporting and metrics with respect to assets and work
  - Asset-based analytics and reporting in order to achieve reliability centered maintenance (RCM) and maintenance optimization

# SAP Plant Maintenance Module overview
# Master Data – Functional locations



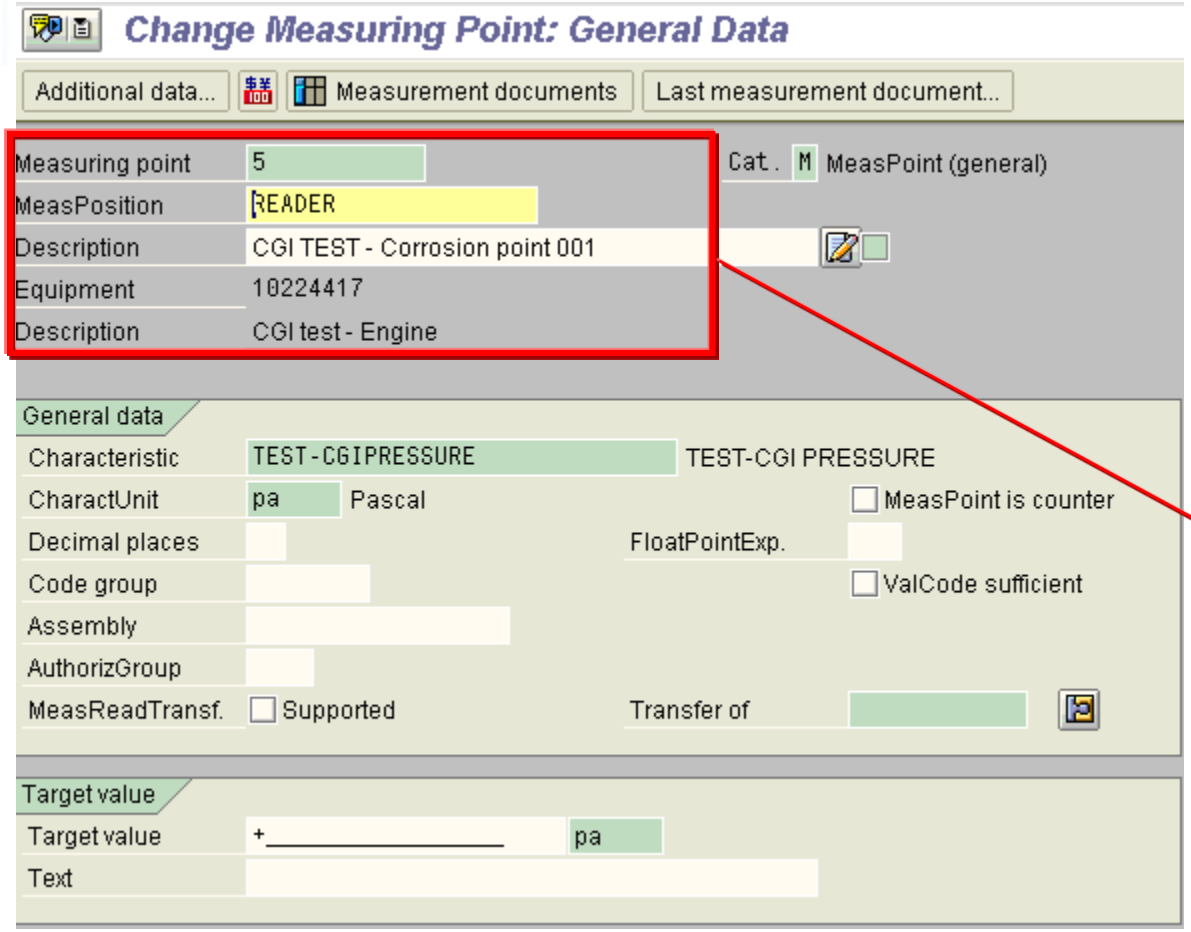

- A functional location represents the place at which a maintenance task is to be performed.
- Functional location can be structured by:
  - Functional criteria.
  - Process-related criteria.
  - Spatial criteria
- Equipments are assigned to Functional locations.

# SAP Plant Maintenance Module overview
# Master Data – Equipment



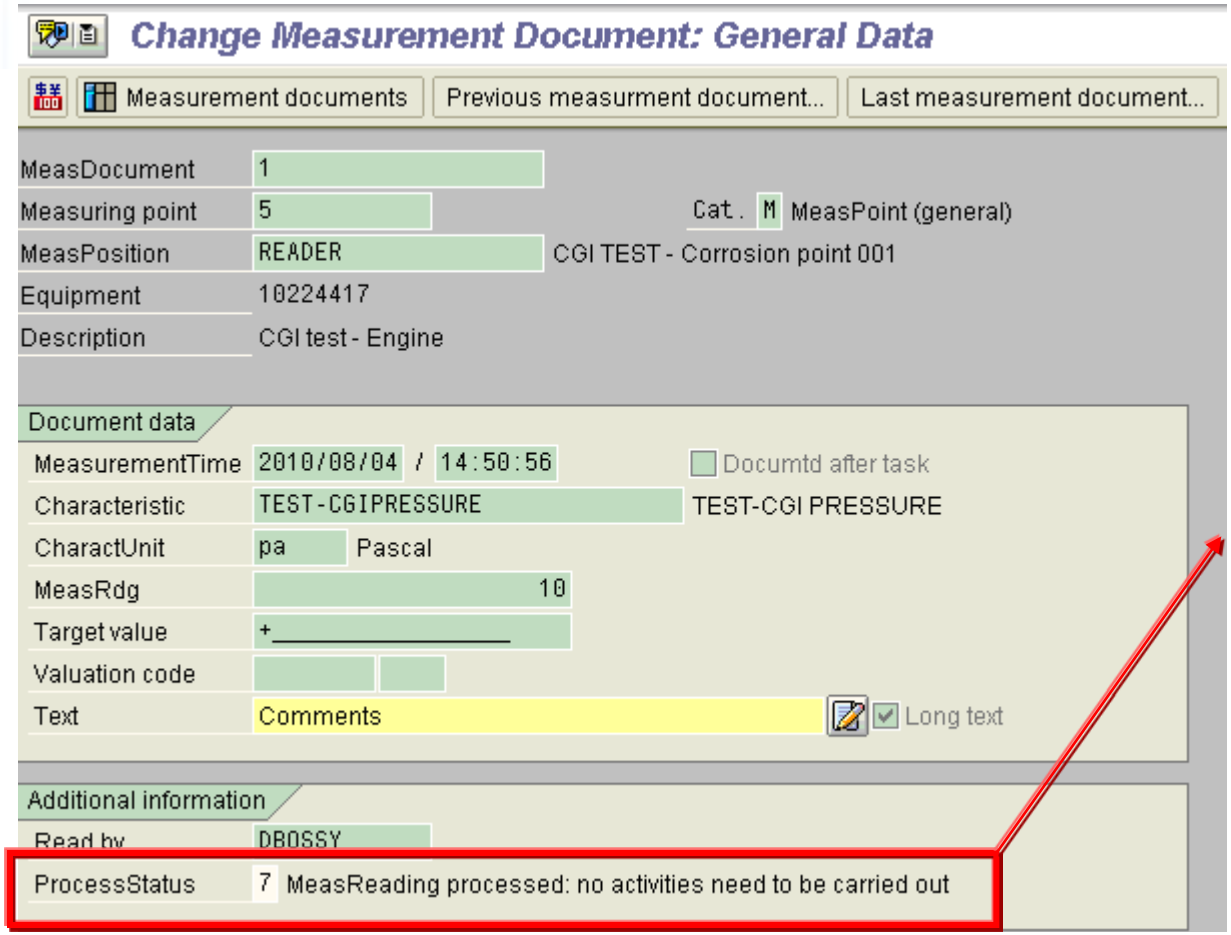

- A piece of equipment is an individual object that is to be maintained independently.
- Equipments are installed in Functional locations.
- Equipments can have sub equipments

# SAP Plant Maintenance Module overview
# Master Data – Measuring point




- Measuring points in the SAP System describe the physical and/or logical locations at which a condition is described.
- Measuring points are located on technical objects, in other words, on pieces of equipment or functional locations.

# SAP Plant Maintenance Module overview
# Measurement documents




- The measurement document is the result of a measurement or counter reading being entered in the system. (Surveys)
- Processing status can be assigned to the measurement document

# SAP Plant Maintenance Module overview
# Measurement reports

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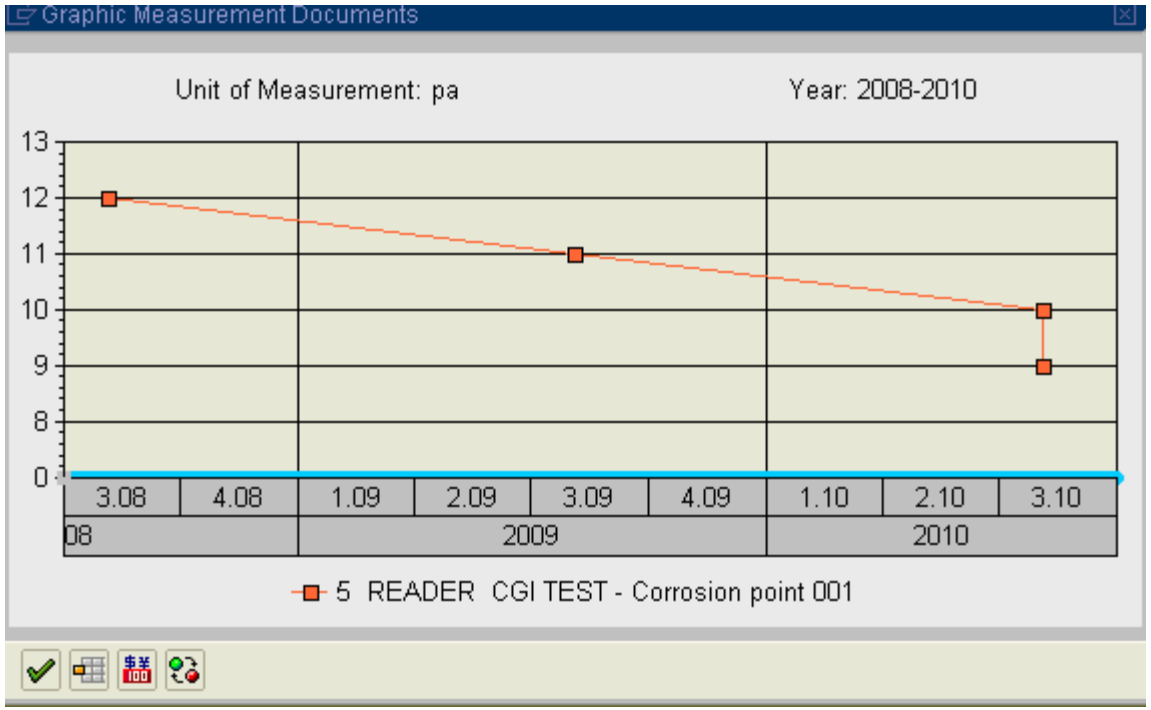
**Display Measurement Documents: Measurement Document List**

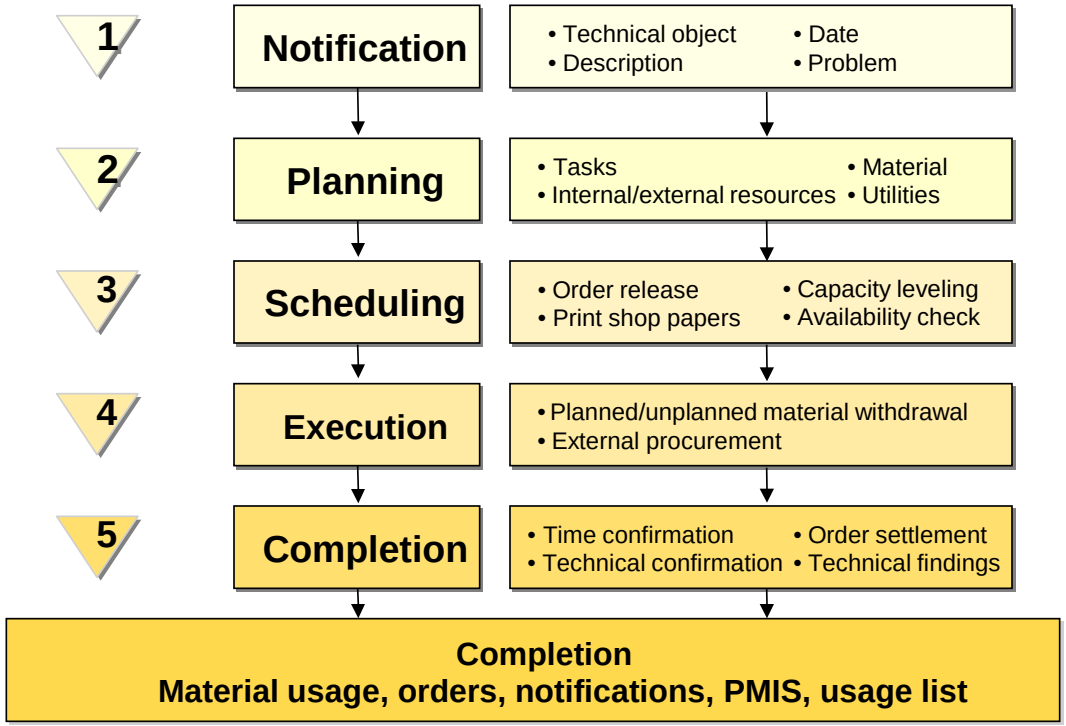
Measurement document | Measuring point

| S | Measurement document | Measuring point | Date | Meas/TotCountrRdg | Unit |
|---|---|---|---|---|---|
| | 4 | 5 | 2010/08/04 | 9 | pa |
| | 3 | 5 | 2009/08/04 | 11 | pa |
| | 2 | 5 | 2008/08/04 | 12 | pa |
| | 1 | 5 | 2010/08/04 | 10 | pa |




Standard reports and graphics are provided by SAP for Measurement documents (Surveys).

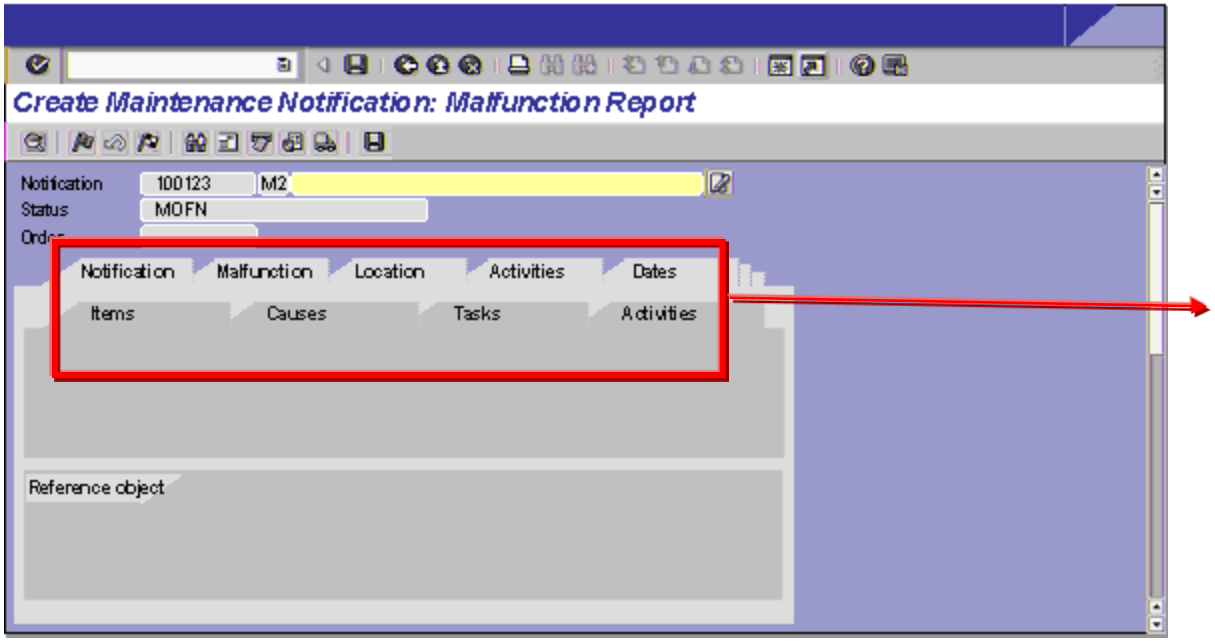
# SAP PM Detailed description
# Steps in Maintenance Processing




The cycle of maintenance processing consists of five steps:

- Step 1: Notification of a malfunction or request for a particular task (for example, new construction).
- Step 2: Creation and planning of an order based on the notification or scheduled maintenance.
- Step 3: Order scheduling with availability check, provision of capacity, printing of order papers.
- Step 4: Actual execution of the work requested, including withdrawal of spare parts from the warehouse and execution of the order.
- Step 5: Completion of the work actually executed, with completion confirmation and technical observations to record the condition of the technical object and possible damage. The order is settled in Controlling.

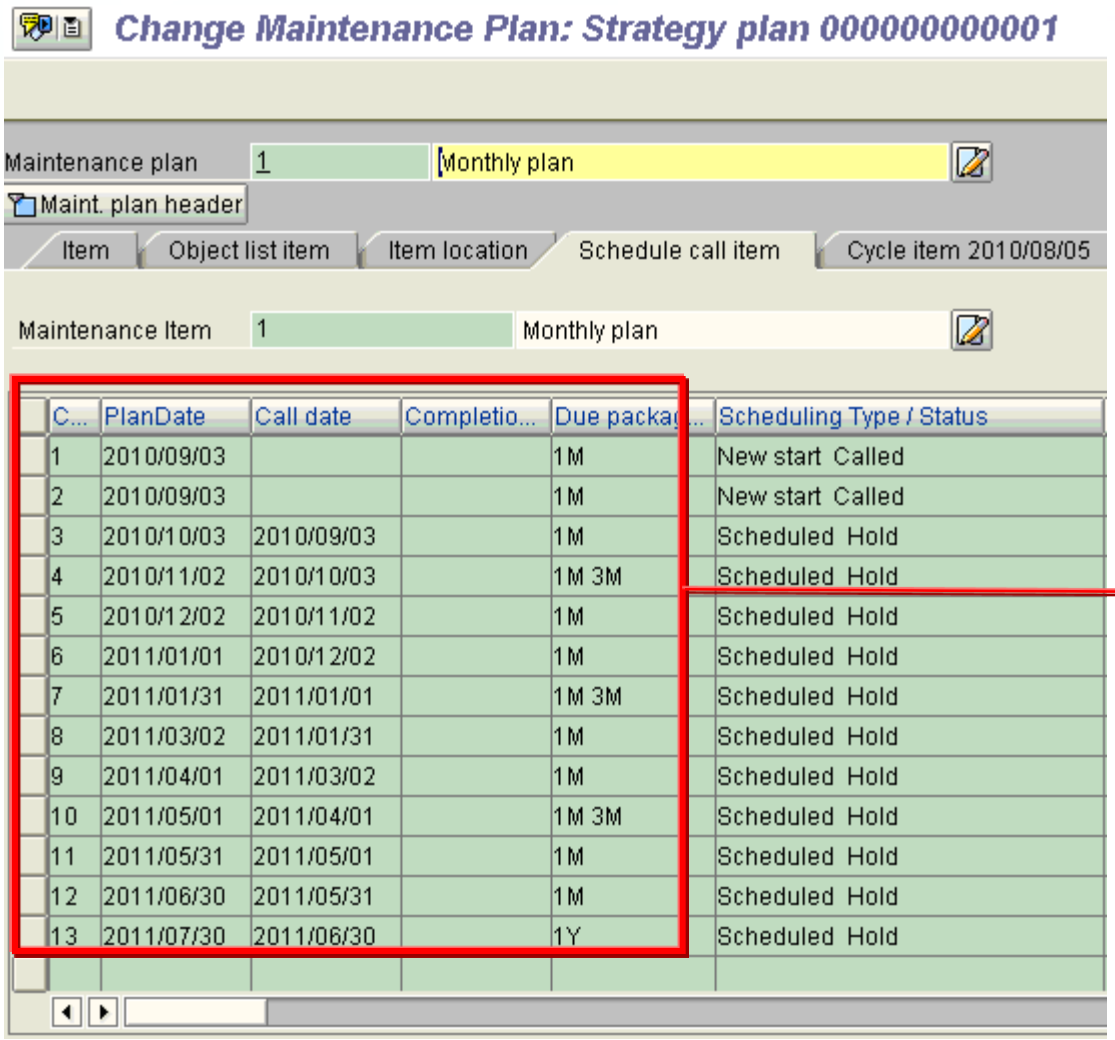
# SAP Plant Maintenance Module overview
# Notification




Maintenance notification is used in the event of a malfunction or exceptional situation to:

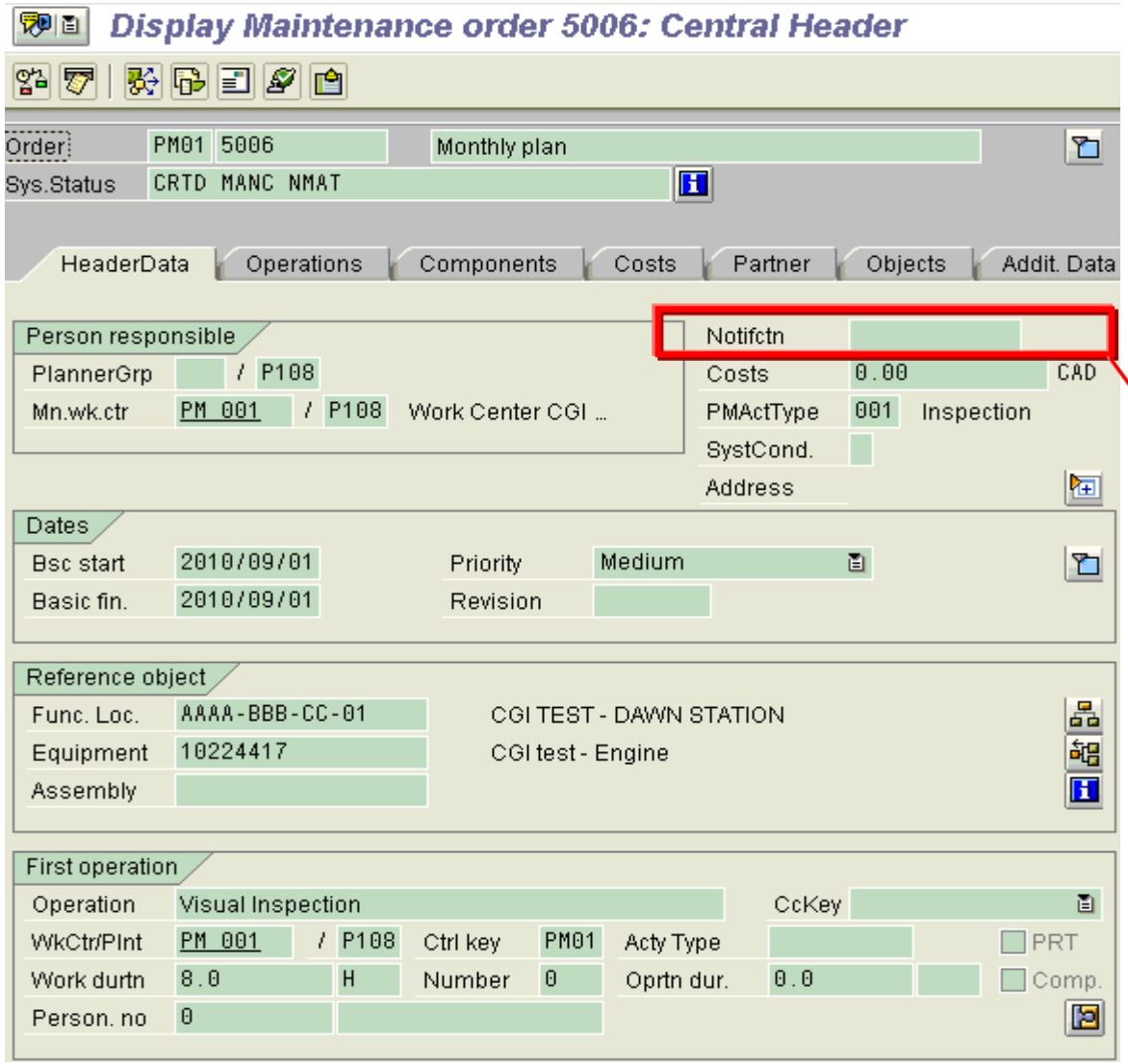
- Describe the exceptional technical condition at an object
- Request the maintenance department to perform a necessary task
- Document work that has been performed

# SAP Plant Maintenance Module overview
# Maintenance planning



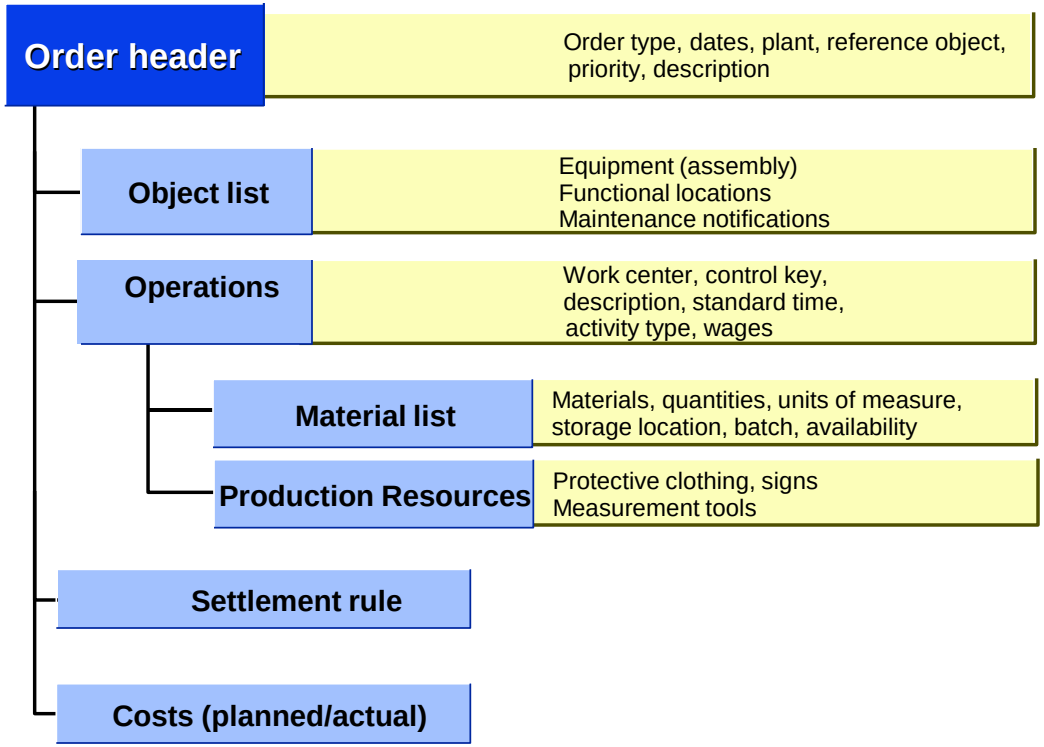

- Maintenance plan: Description of the maintenance and inspection tasks to be performed at maintenance objects.
- The maintenance plans describe the dates and scope of the tasks.
- Plans are created for Functional locations and Equipments.

# SAP Plant Maintenance Module overview
# Work Order




- A work order provides all the information required to complete tasks at a technical object.
- Orders can be created with or without reference to a notification (work order request).
- There are different types of work orders such as:
  - Maintenance Orders.
  - Calibration orders.
  - Refurbishment orders.
  - Construction orders.

# SAP Plant Maintenance Module overview
# Basic structure of a work order




**Header data** is information used to identify and administer work orders, such as order number, description, order type, dates for order execution, priority, created by and changed by.

The **object list** contains functional locations, equipment, assemblies, maintenance notifications, and/or materials with serial numbers. A single object can be entered in the order header as a reference object. In the object list, several objects can be entered.

**Operations** are used to describe the work to be carried out according to the order (the process includes the work center, the time required and the control key).

**Materials** are spare parts that are needed and used to execute the order.

**Production resources** (e.g. tools, protective clothing, signs) are also needed to execute the order.

The data in the **Settlement rule** states who is usually responsible for the costs.

The **cost data** informs of the estimated costs, as well as the planned and actual costs of the order.

# SAP Plant Maintenance Module overview
# Work Order detail

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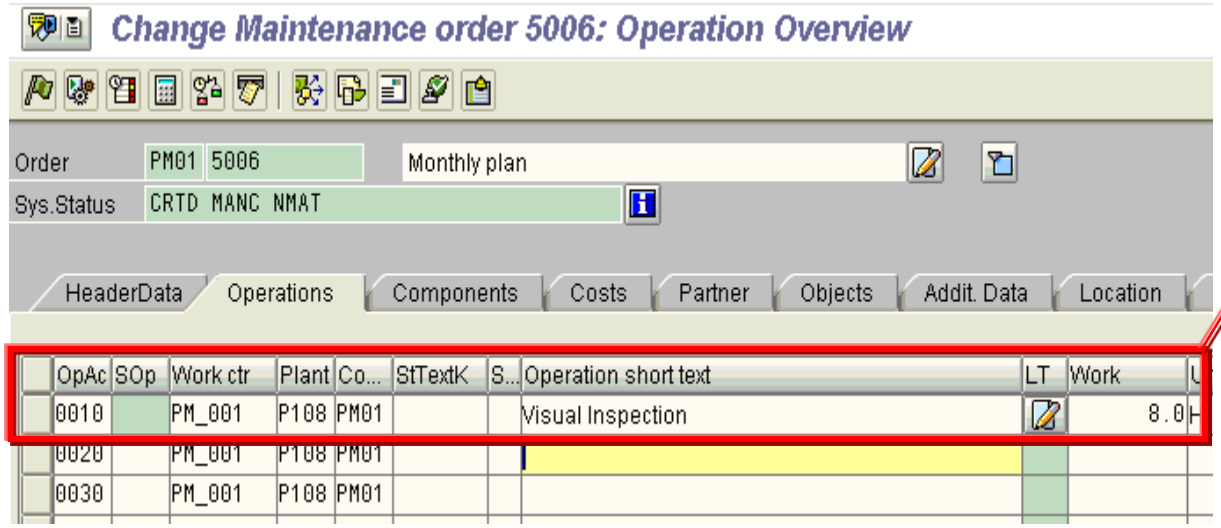
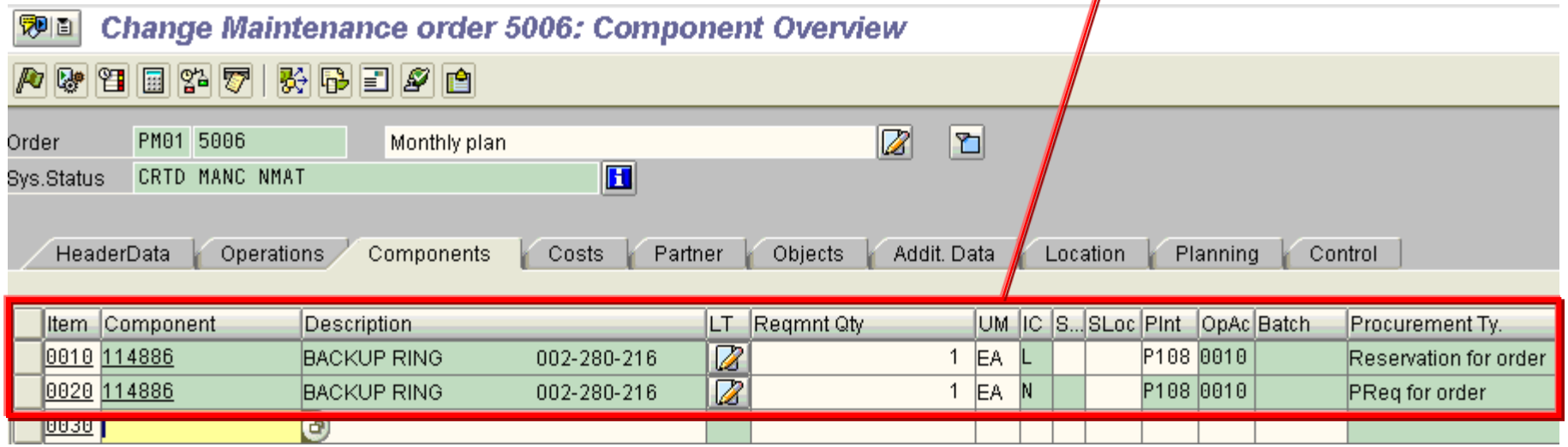



- Operations are tasks to be executed.
- Components are a BOM required to execute the maintenance.



# SAP Plant Maintenance Module overview
# Work Order confirmation

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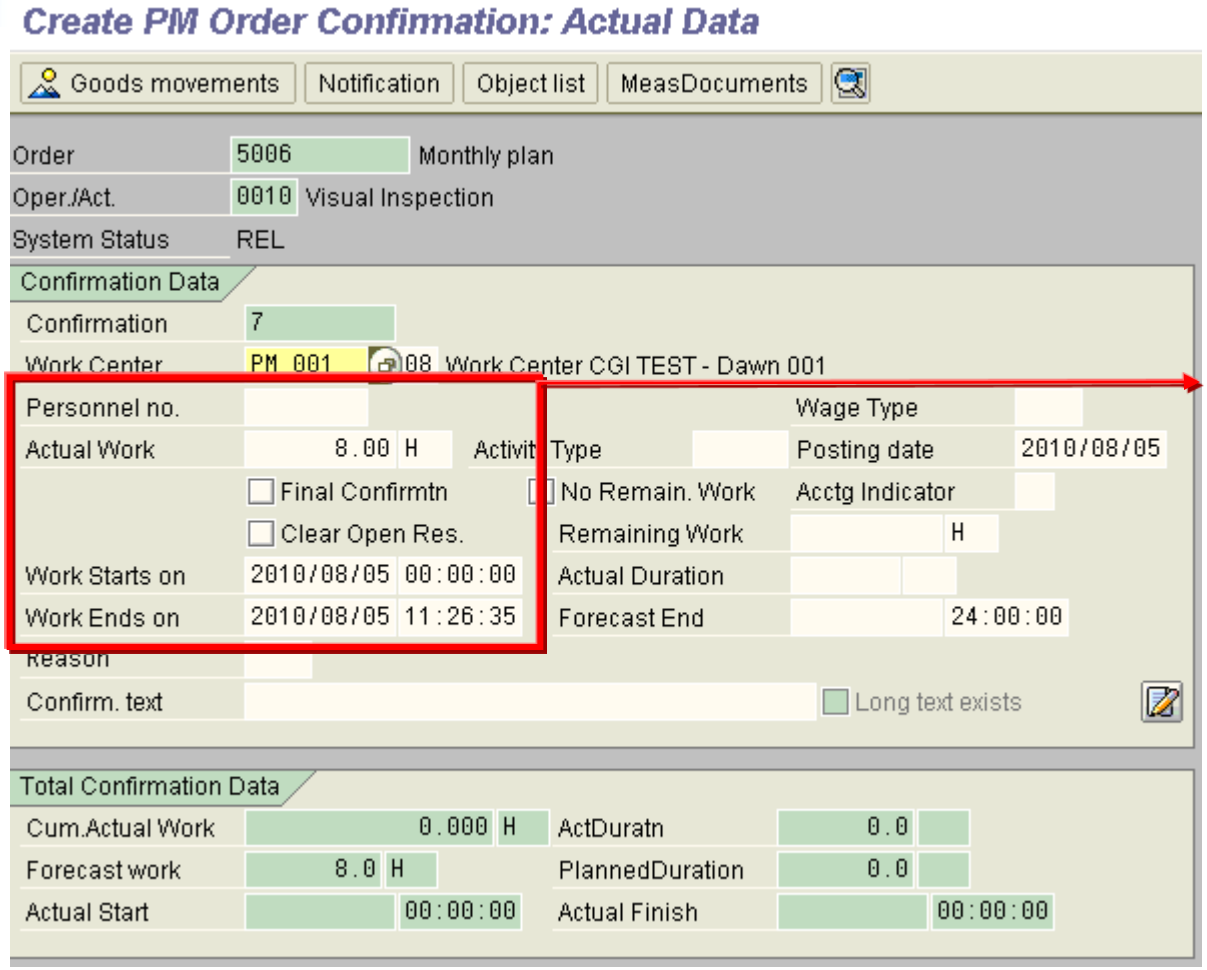


- Confirmations are used to update status of the order after the work has been executed.
- Information updated includes:
  - Actual work time.
  - Personnel nr.
  - Date
  - Materials

# SAP Plant Maintenance Module overview
# Cross-Application Time Sheet (CA-TS)

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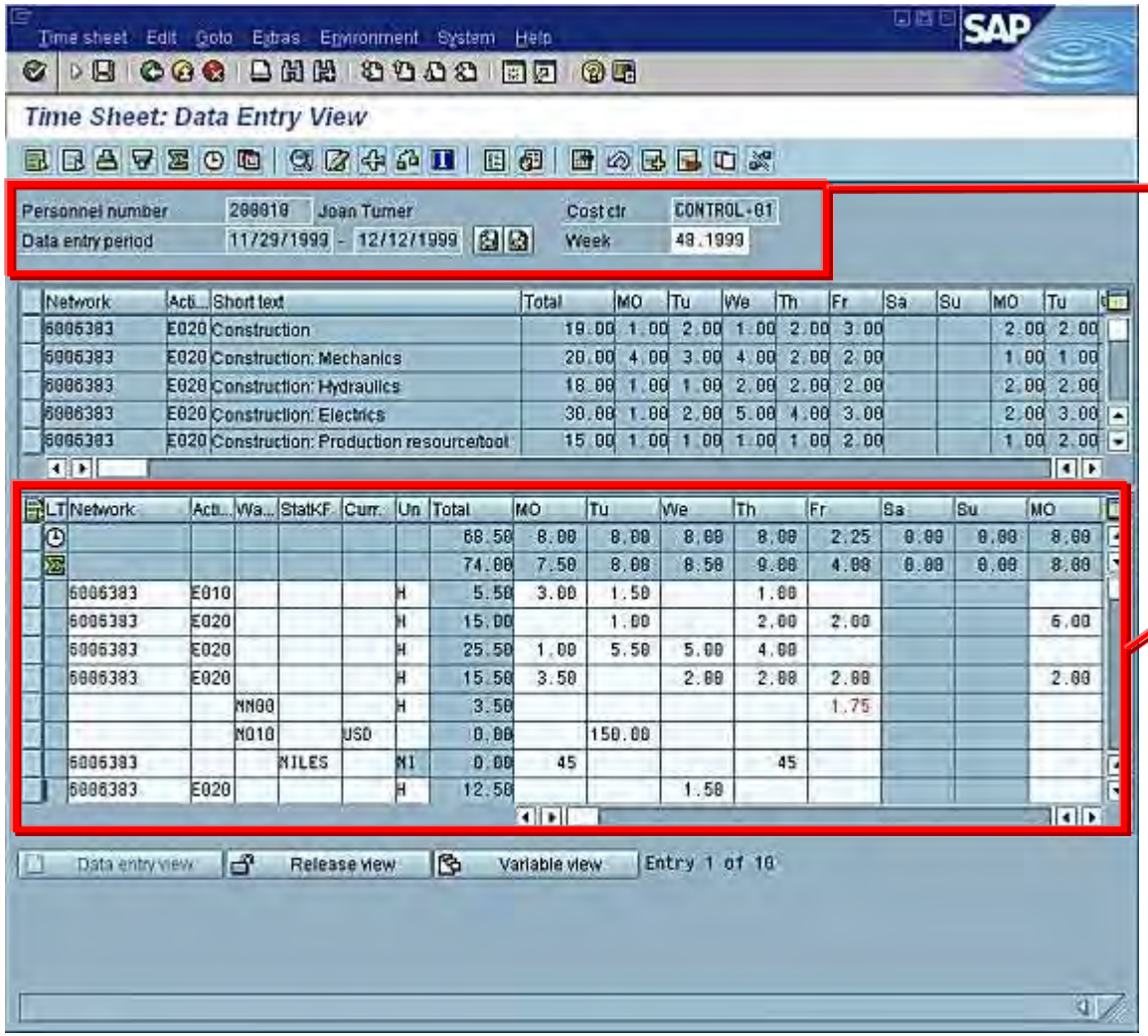


- The *Time Sheet* is a cross-application tool for recording employee working times.
- Working times are recorded centrally, together with cost accounting and confirmation, and then made available to other SAP System applications for further processing.

# SAP Plant Maintenance Module overview
# Plant Maintenance Reports

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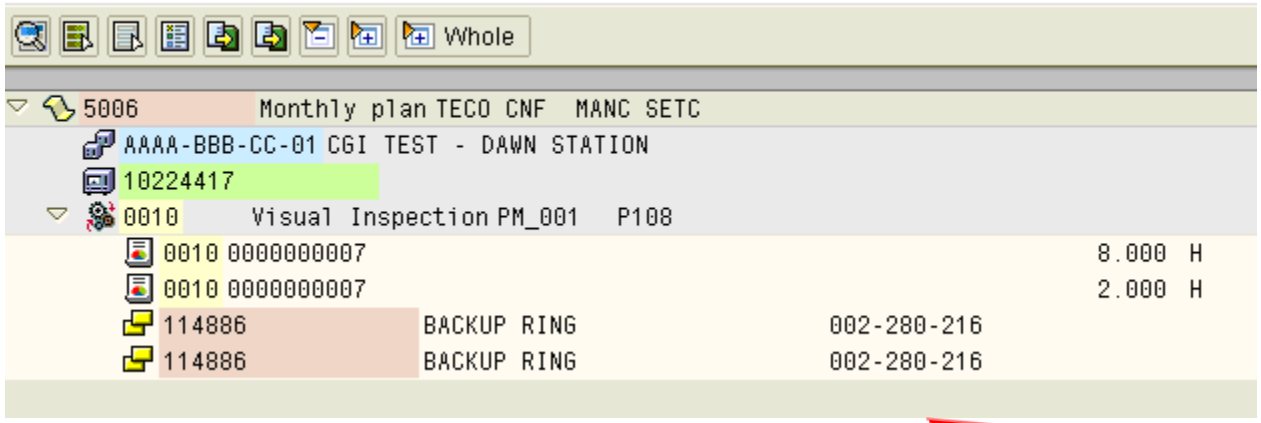
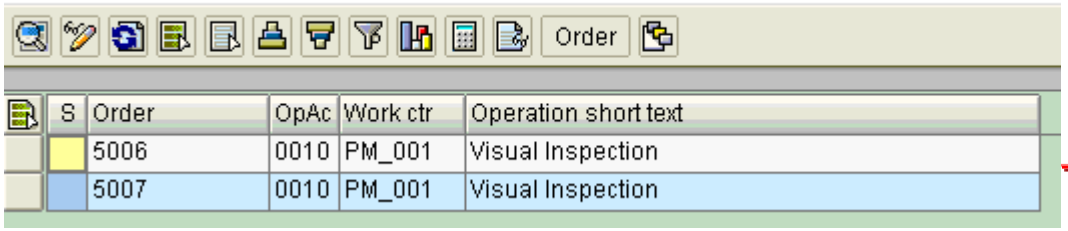
***Order List (Multi-Level): List of Orders***




***Display Operations: List of Order Operations***




- SAP provides standard reports through Plan Maintenance Information System. (PMIS).
- Multi level reports provides work Order info including, tasks, actual time and status
- Additionally customized reports can be created as required.

# Appendix 3

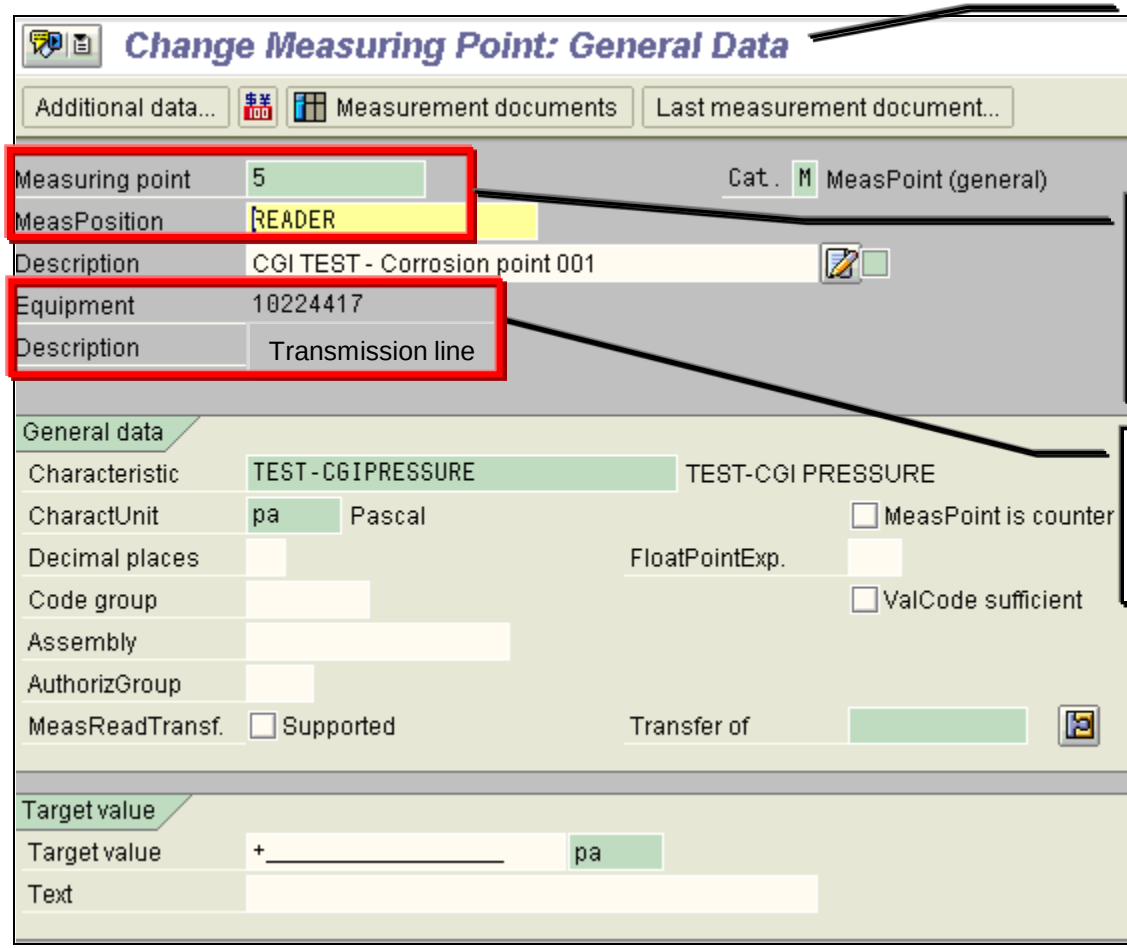
**SAP Storyboards**

Corrosion Surveys

Work Order Management

Time Reporting

# Storyboard – Corrosion surveys 1/3

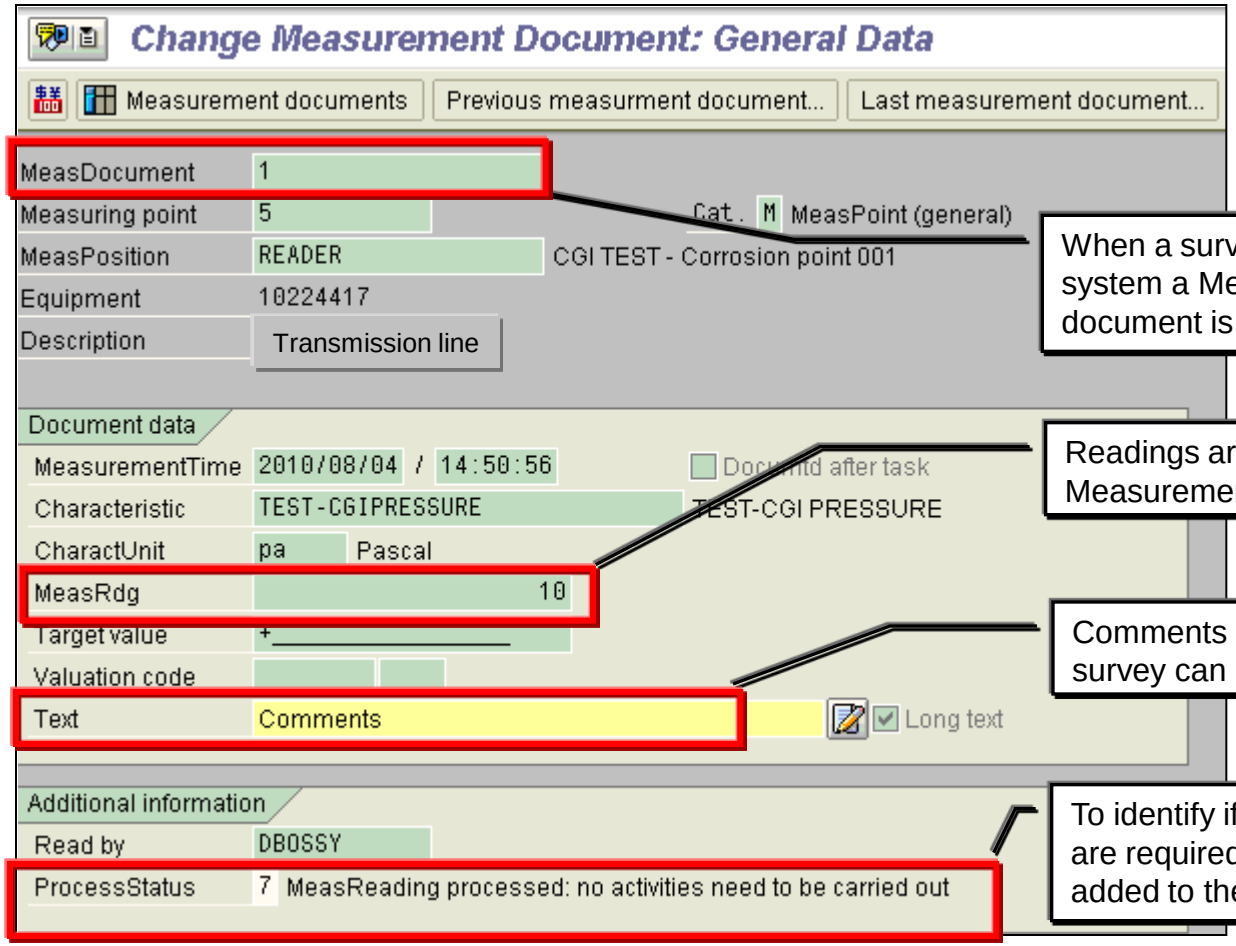



Measuring points in the SAP System represent the physical and/or logical locations at which a condition is described.

Surveys are executed in the Distribution and Transmission lines. The place where a survey is executed is called Measuring point in SAP.

Measuring points are located on technical objects, in other words, on pieces of equipment or functional locations.

# Storyboard – Corrosion surveys 2/3



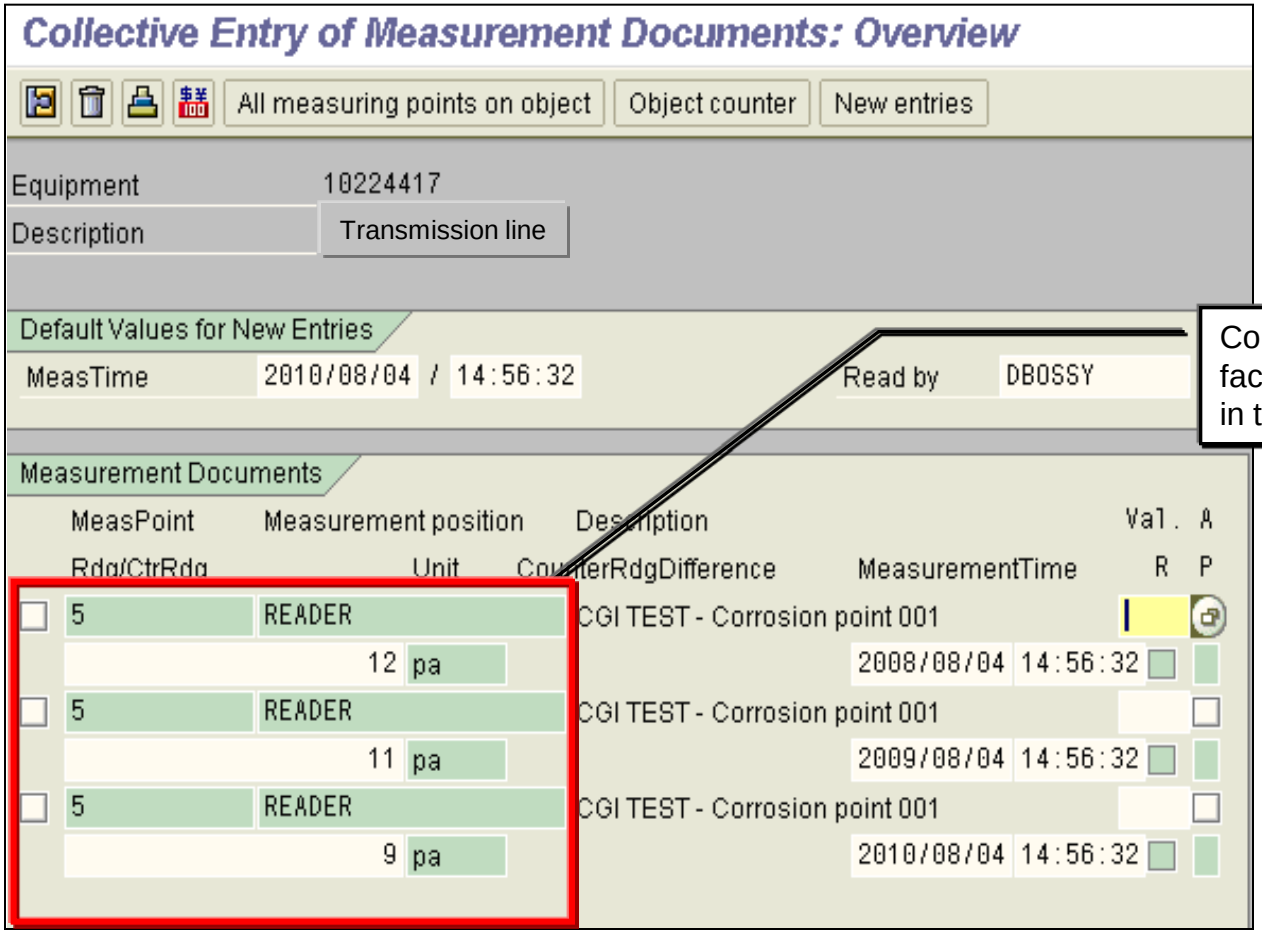

When a survey is entered in the system a Measurement document is created

Readings are entered as Measurement reading.

Comments related to the survey can be added

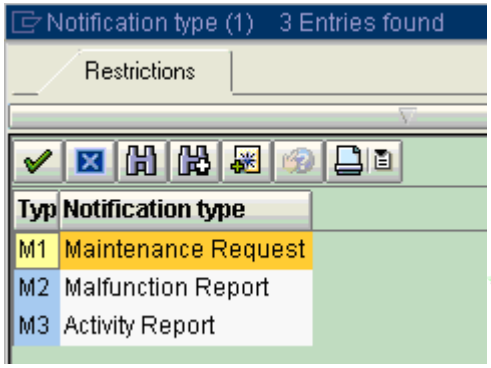
To identify if additional activities are required, a status can be added to the reading.

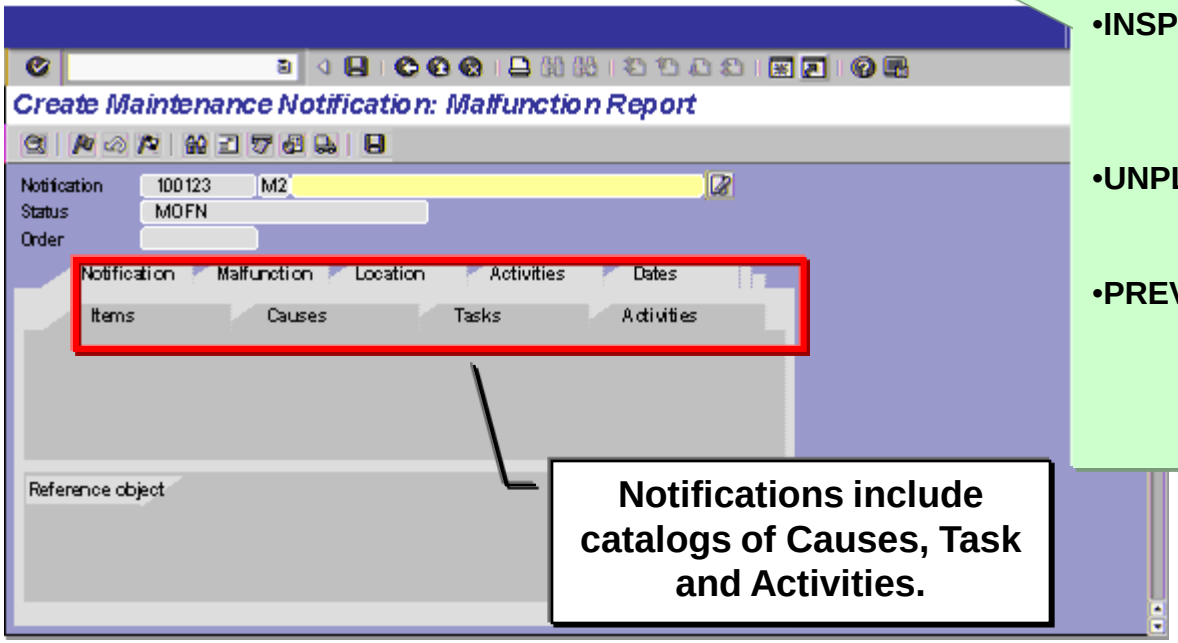
# Storyboard – Corrosion surveys 3/3




Collective entry for readings facilitate the capture of surveys in the system.

# Storyboard – Work Order Management 1/5




**Notification**

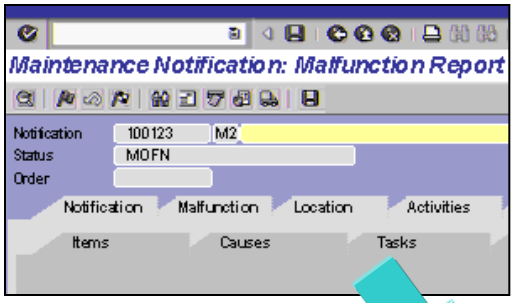
Technical object Date
Description Problem

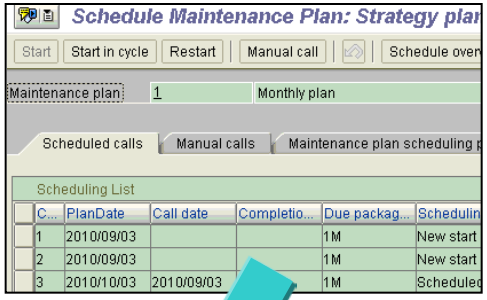
1

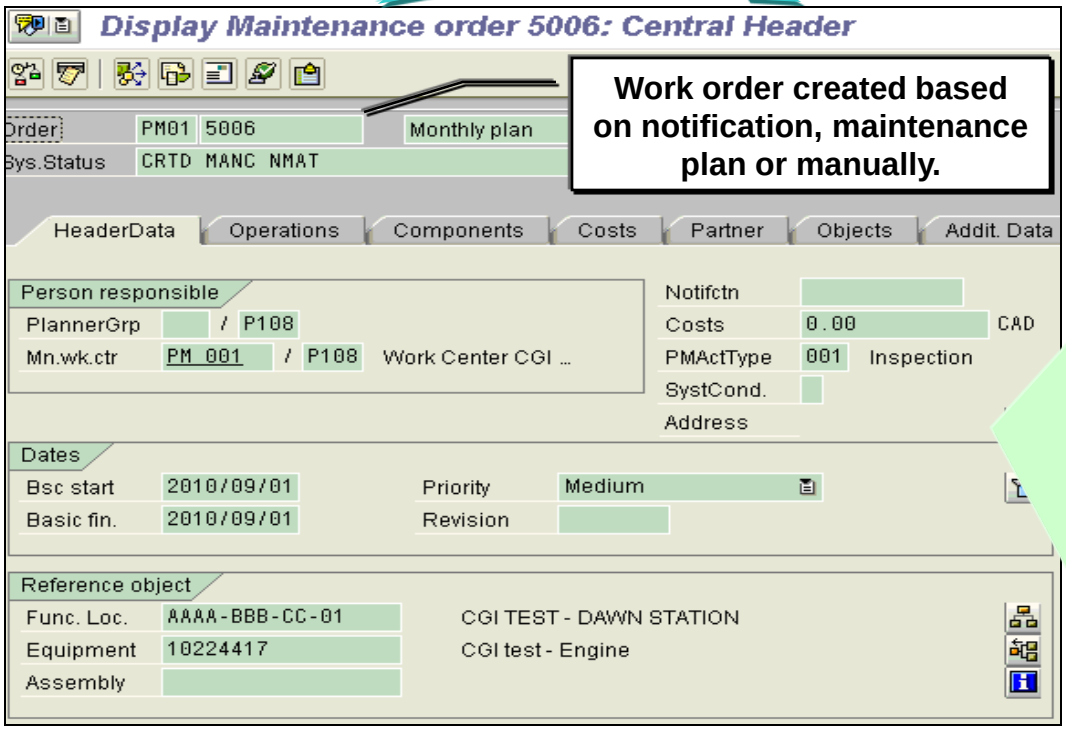
Notification of a malfunction or request for a particular task

- **CONSTRUCTION:**
  - Notification is created when builder is requesting work.
- **INSPECTION:**
  - Notification is created when technicians send request to planning for USR to inspect station.
- **UNPLANNED MAINTENANCE**
  - When a problem is identified, Notification is created with problem description.
- **PREVENTIVE MAINTENANCE**
  - Work orders that are created based on Preventive maintenance do not require notification.

# Storyboard – Work Order Management 2/5




**Work order created based on notification, maintenance plan or manually.**

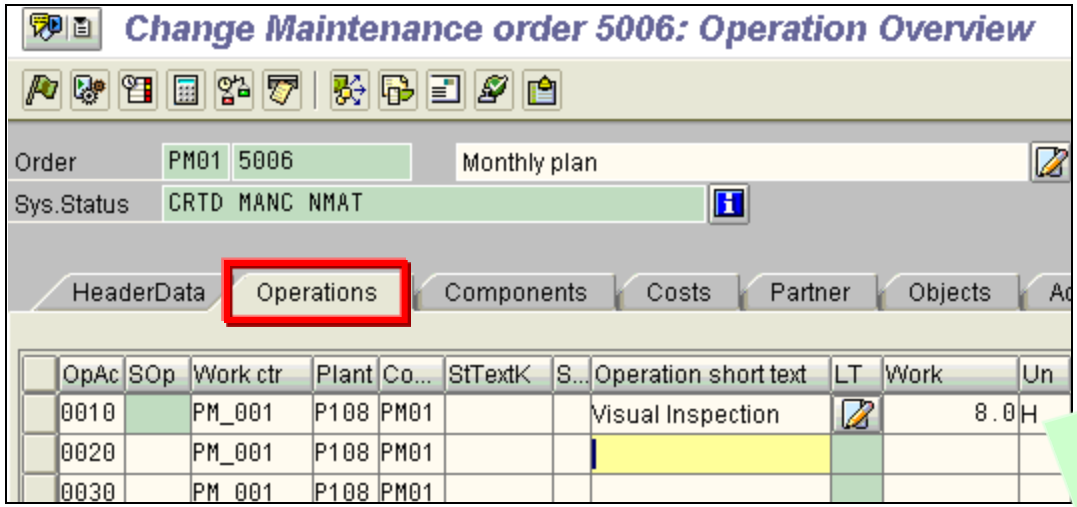
**Planning**

Tasks Material
Internal/external resources Utilities
**2**

Creation and planning of an order based on notification or maintenance plan. Including creating operations, making reservations for parts, and planning execution times

- **CONSTRUCTION:**
  - Work orders created for Pressure test or installation.
  - Requirement for meters are created from the work order.
- **INSPECTION:**
  - Work order is created to inspect station.
  - USR is responsible for carrying out the inspection.
- **UNPLANNED MAINTENANCE**
  - Work orders are created based on Malfunction report.
- **PREVENTIVE MAINTENANCE**
  - Work orders are created based on Maintenance plan.
  - Activities and BOM are included in Work Order.

# Storyboard – Work Order Management 3/5




**Scheduling**

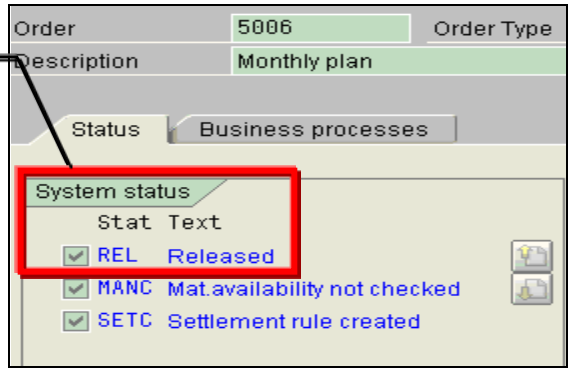
Order release Capacity leveling
Print shop papers Availability check

3

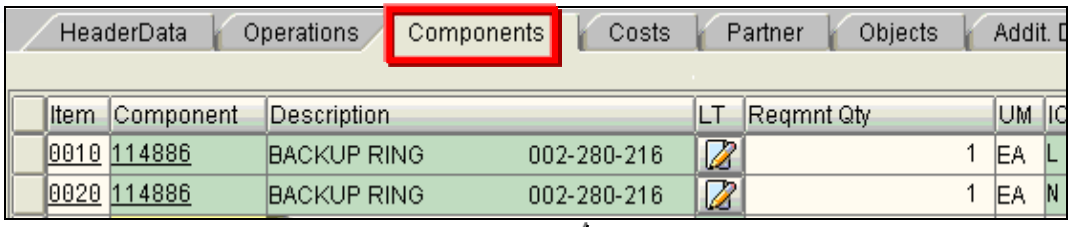
Order scheduling and release with availability check, provision of capacity, printing of order papers

- **CONSTRUCTION:**
  - When Work order is released, fax is send to builder to confirm request.
- **INSPECTION:**
  - Work Order is released (dispatched)
- **PLANNED OR UNPLANNED MAINTENANCE:**
  - Work Order is released (dispatched)

- **Tasks (operations) are scheduled and the Work Order is released (dispatched)**
- **If required Work order can be transferred to Advantex**



# Storyboard – Work Order Management 4/5




Withdrawal of spare parts from the warehouse and execution of the order

**Execution**

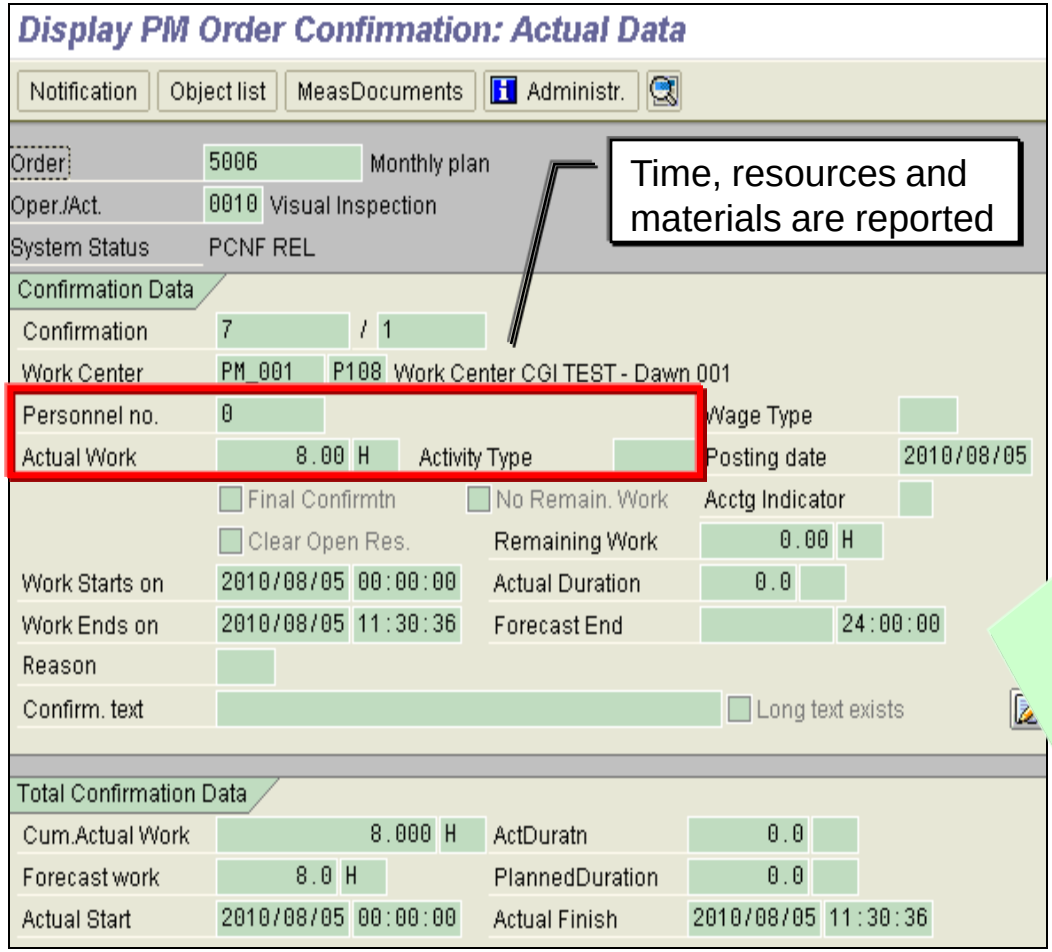
Material withdrawal
External procurement

4

Actual execution of the work requested, including withdrawal of spare parts from the warehouse and execution of the order

- **CONSTRUCTION:**
  - Pressure test or installation is executed.
- **INSPECTION:**
  - Inspection is executed.
- **PLANNED OR UNPLANNED MAINTENANCE:**
  - Activities are executed.
  - Technician takes notes that can be scanned and attached to work order.

# Storyboard – Work Order Management 5/5




**Completion**

Time confirmation Order settlement
Technical confirmation and findings

5

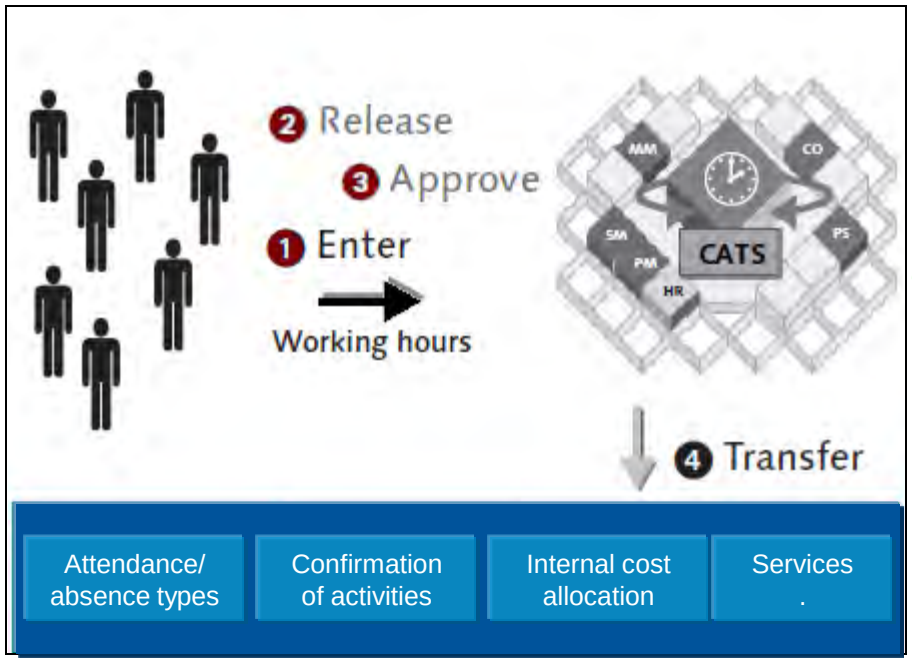
Completion of the work actually executed, with technical observations. The order is settled in Controlling

- **CONSTRUCTION:**
  - Time is reported for one person or multiple people under one project using Cross Application Time Sheet functionality (CATS)
- **INSPECTION**
  - When inspection is completed, activities and time are confirmed in SAP.
  - Technician is notified through an automated email.
  - If required, Notification is created based on fault info from USR.

**PLANNED OR UNPLANNED MAINTENANCE:**

- Time is reported and activities confirmed using CATS or standard SAP confirmation.
- Notes are scanned and attached to Orders.

# Storyboard – Time report 1/2



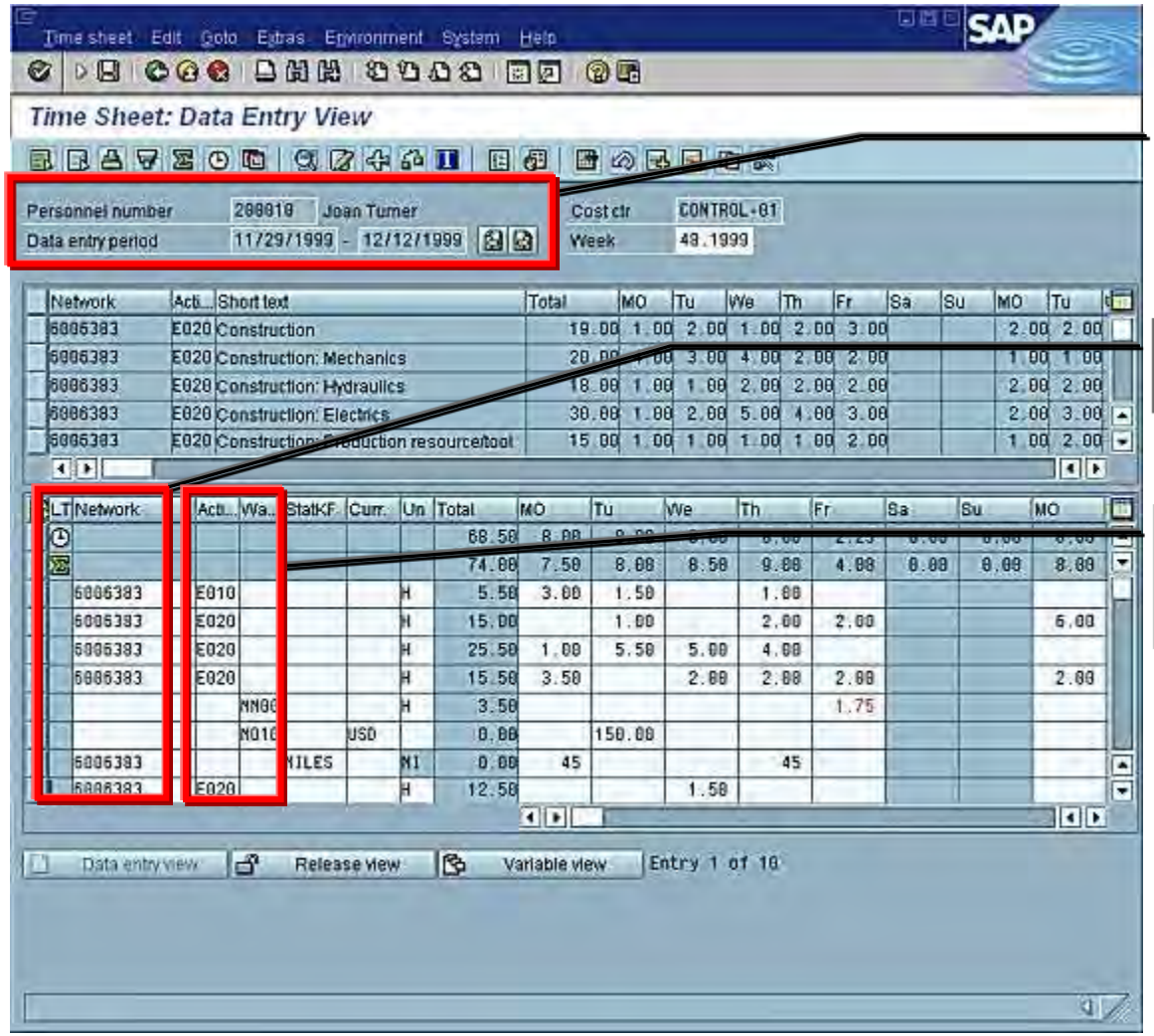

•The *Time Sheet* is a cross-application tool for recording employee working times.

• Working times are recorded centrally, together with cost accounting, confirmation, and external services information, and then made available to other SAP System applications for further processing.

•The *Time Sheet* is a self-service application which allows both internal and external employees to enter their own working times.

•Working hours are:
- •Entered.
- •Released.
- •Approved.
- •Transferred

# Storyboard – Time report 2/2




Time report can be entered for one or for several personnel number

Time is allocated to a cost object. i.e.: Network or Work order.

Time can be reported by activity. Each activity could have different hourly rate

# Appendix 4

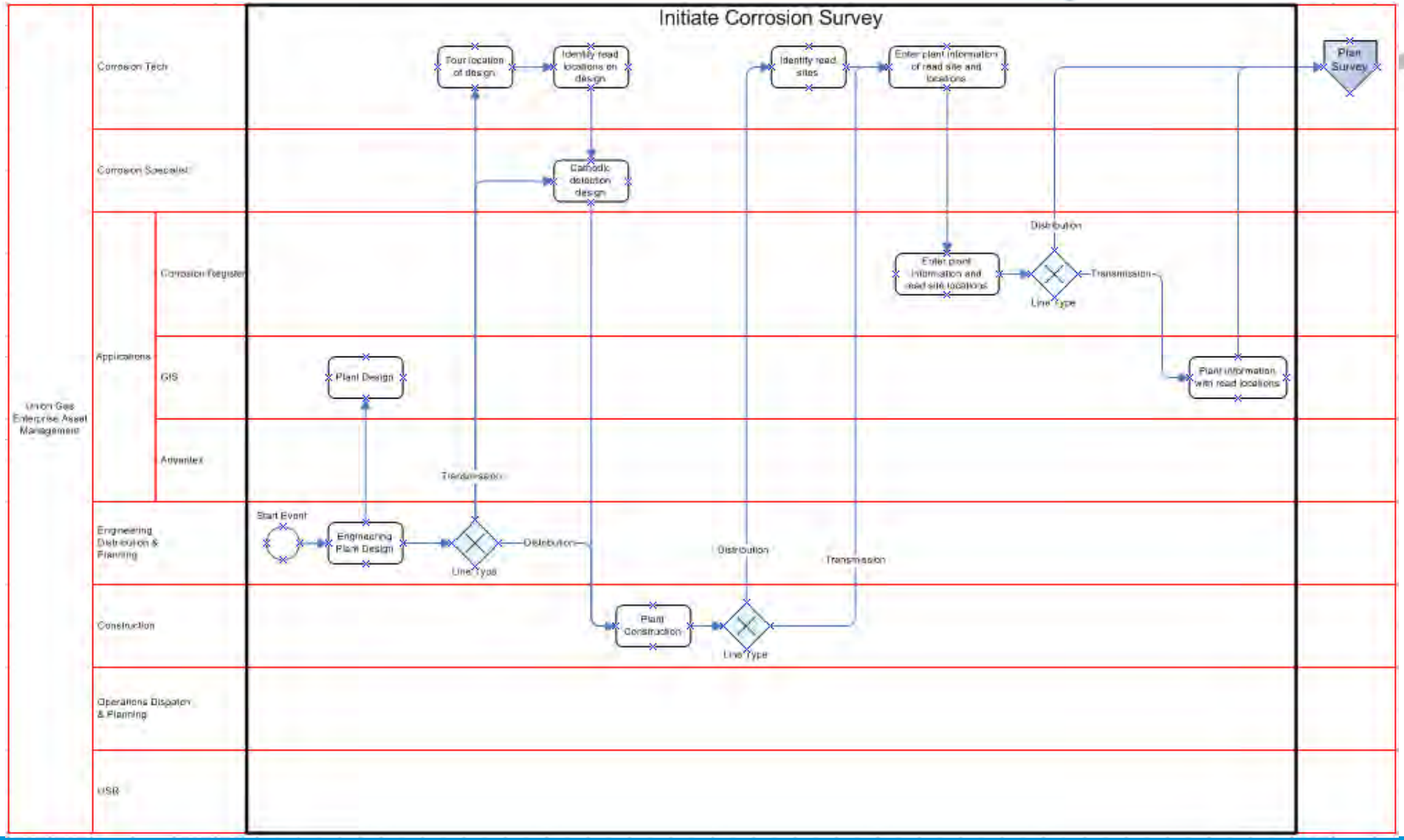
## Process Maps

Corrosion

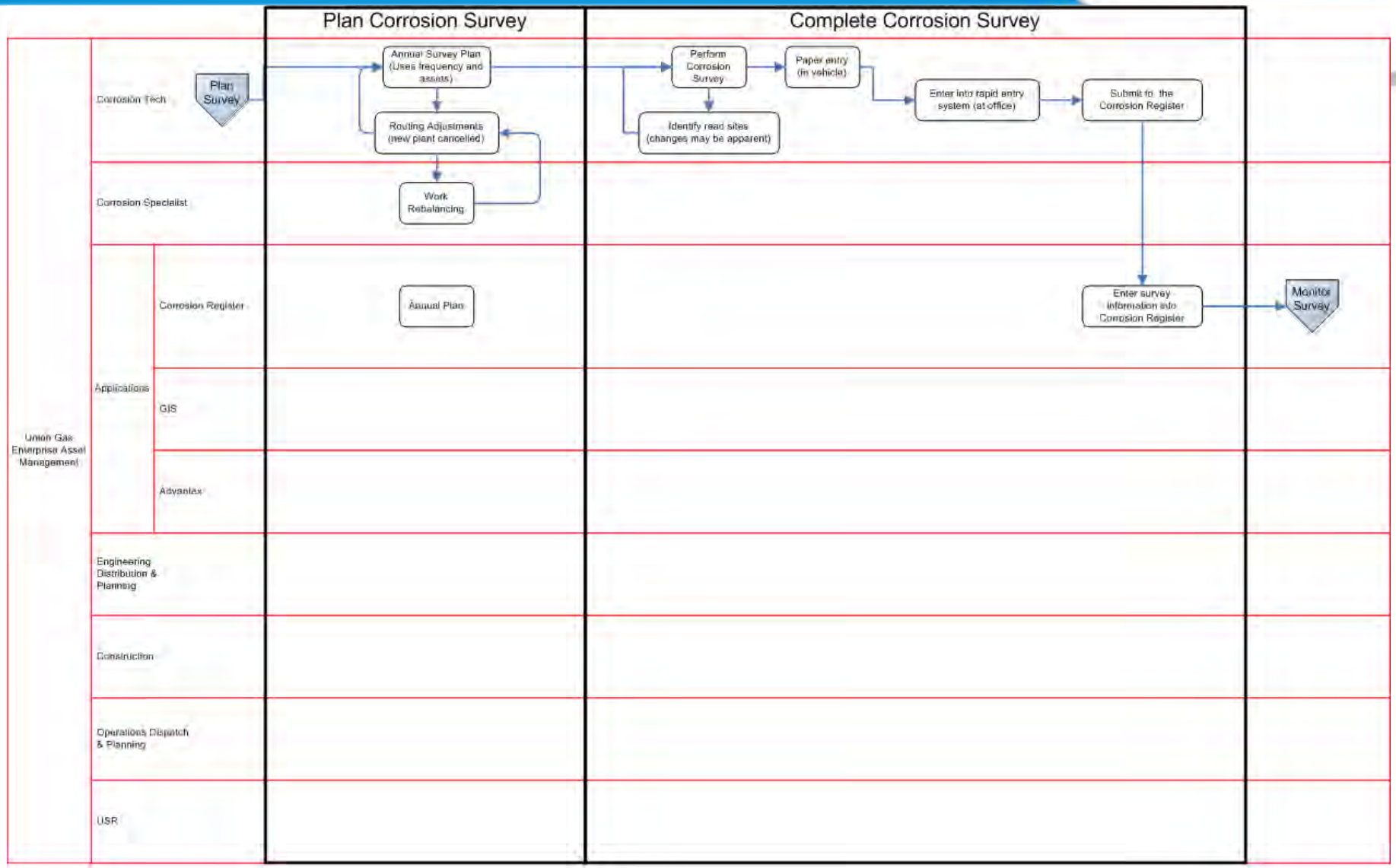
MISOS

CARS

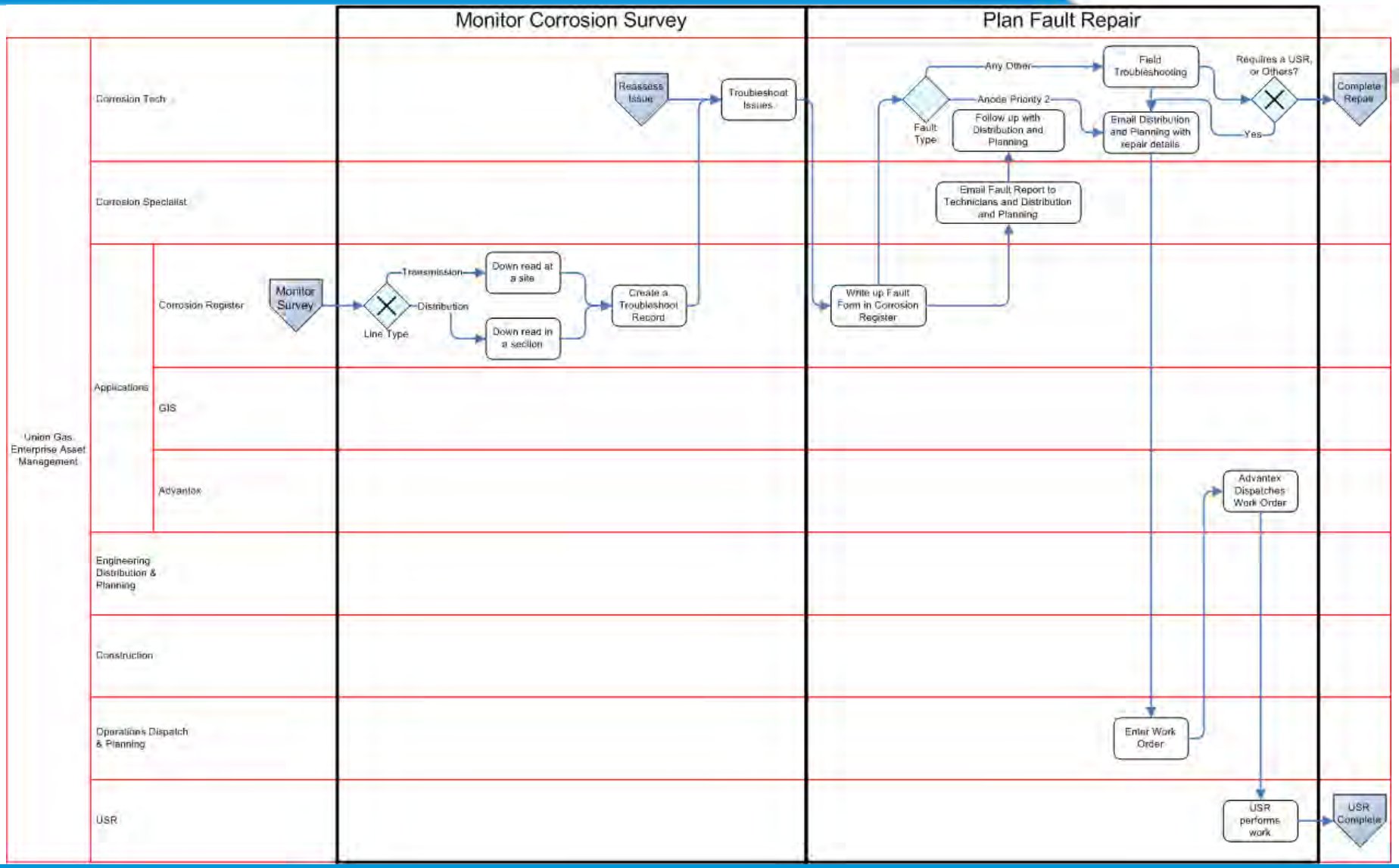
# Corrosion Register – Initiate Survey



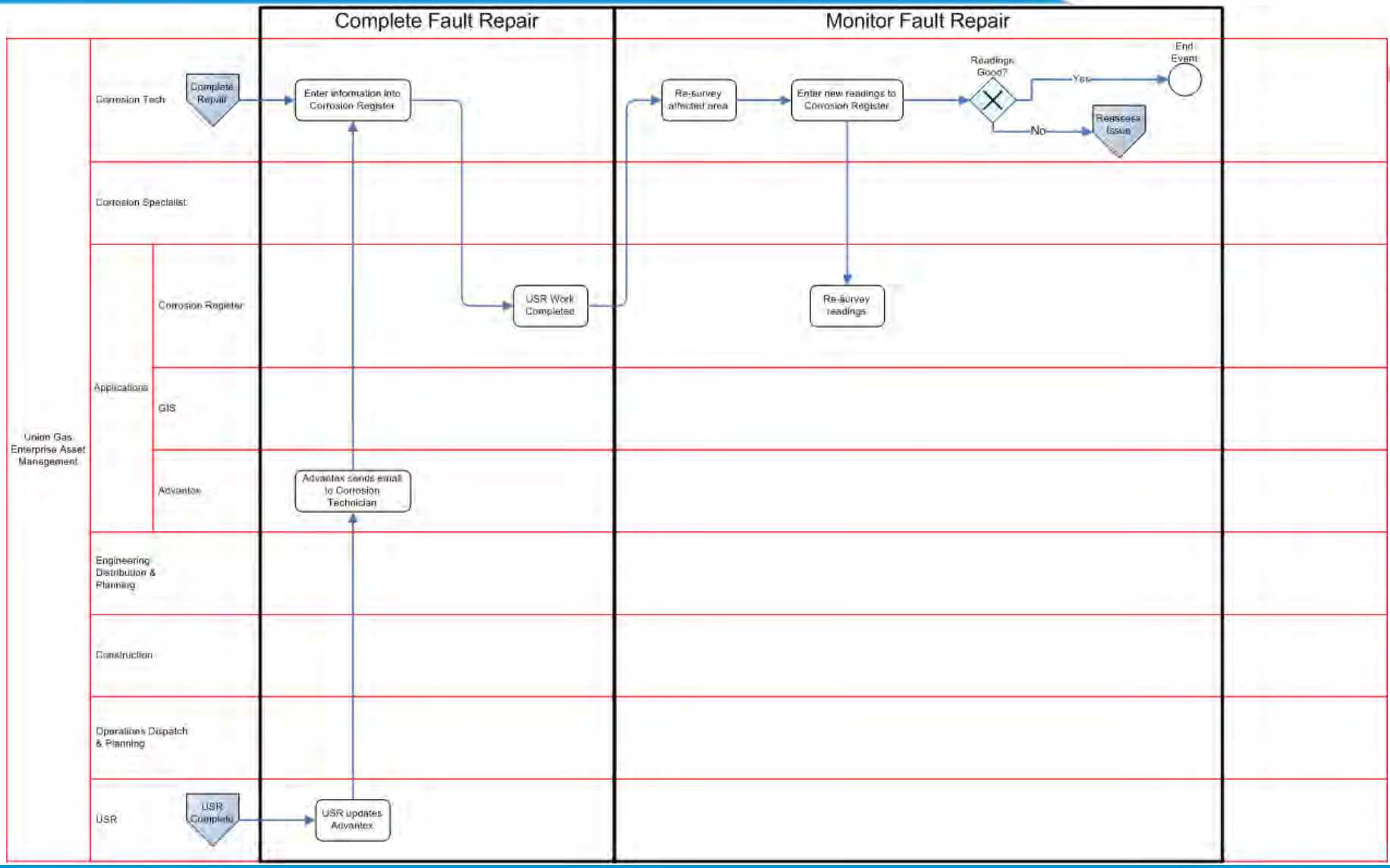
# Corrosion Register – Plan and Complete Survey

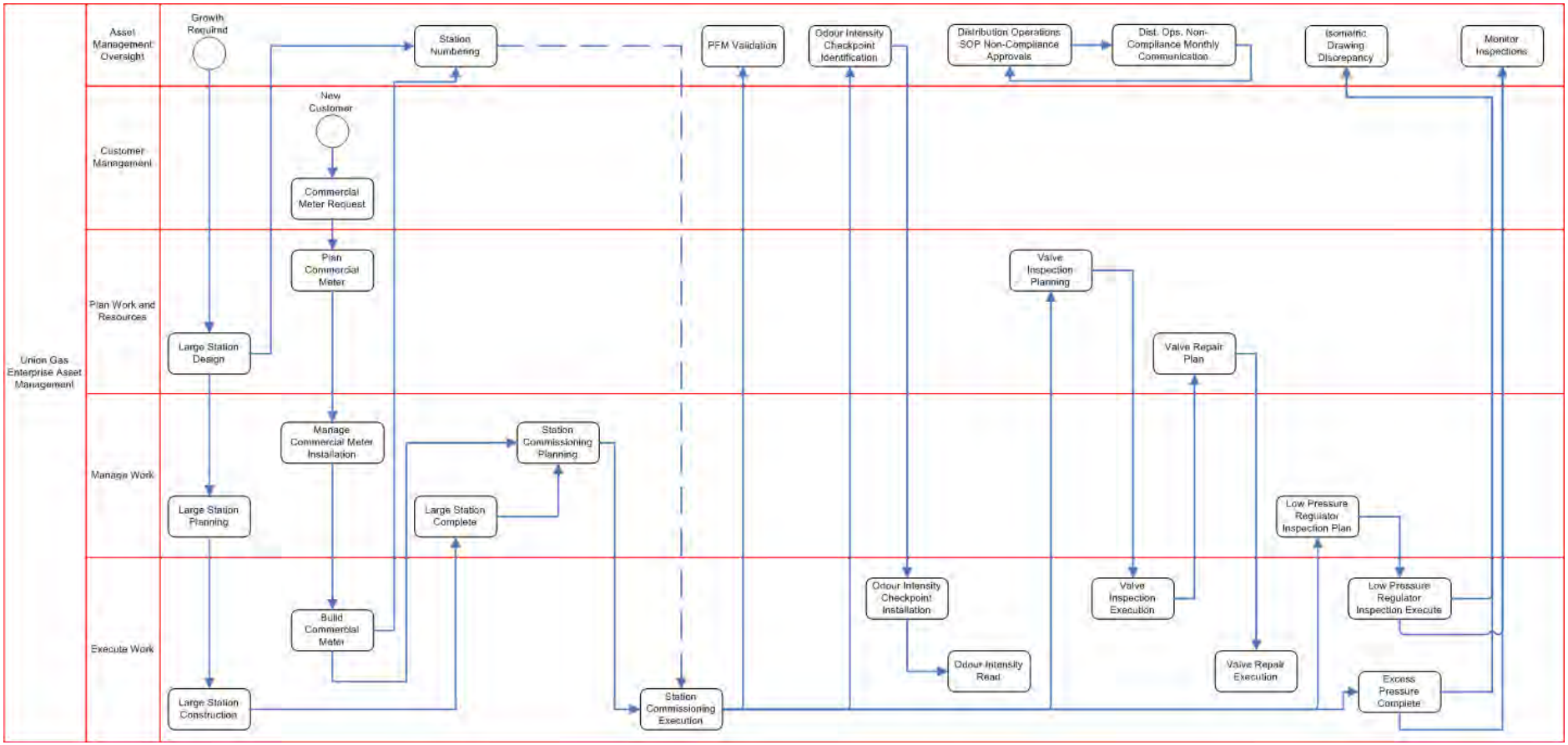


# Corrosion Register – Monitor Survey and Plan Fault Repair

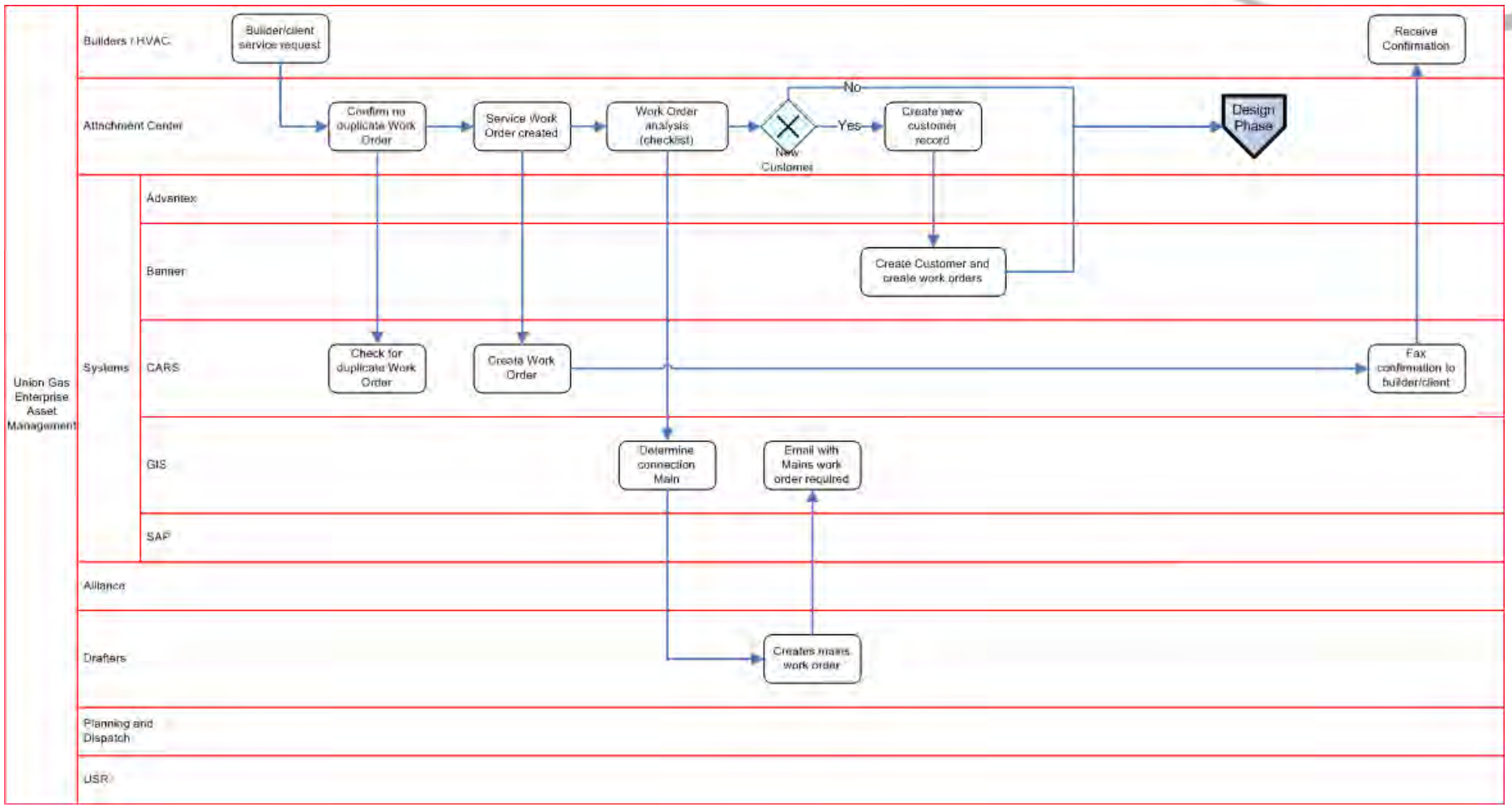


# Corrosion Register – Complete and Monitor Fault Repair

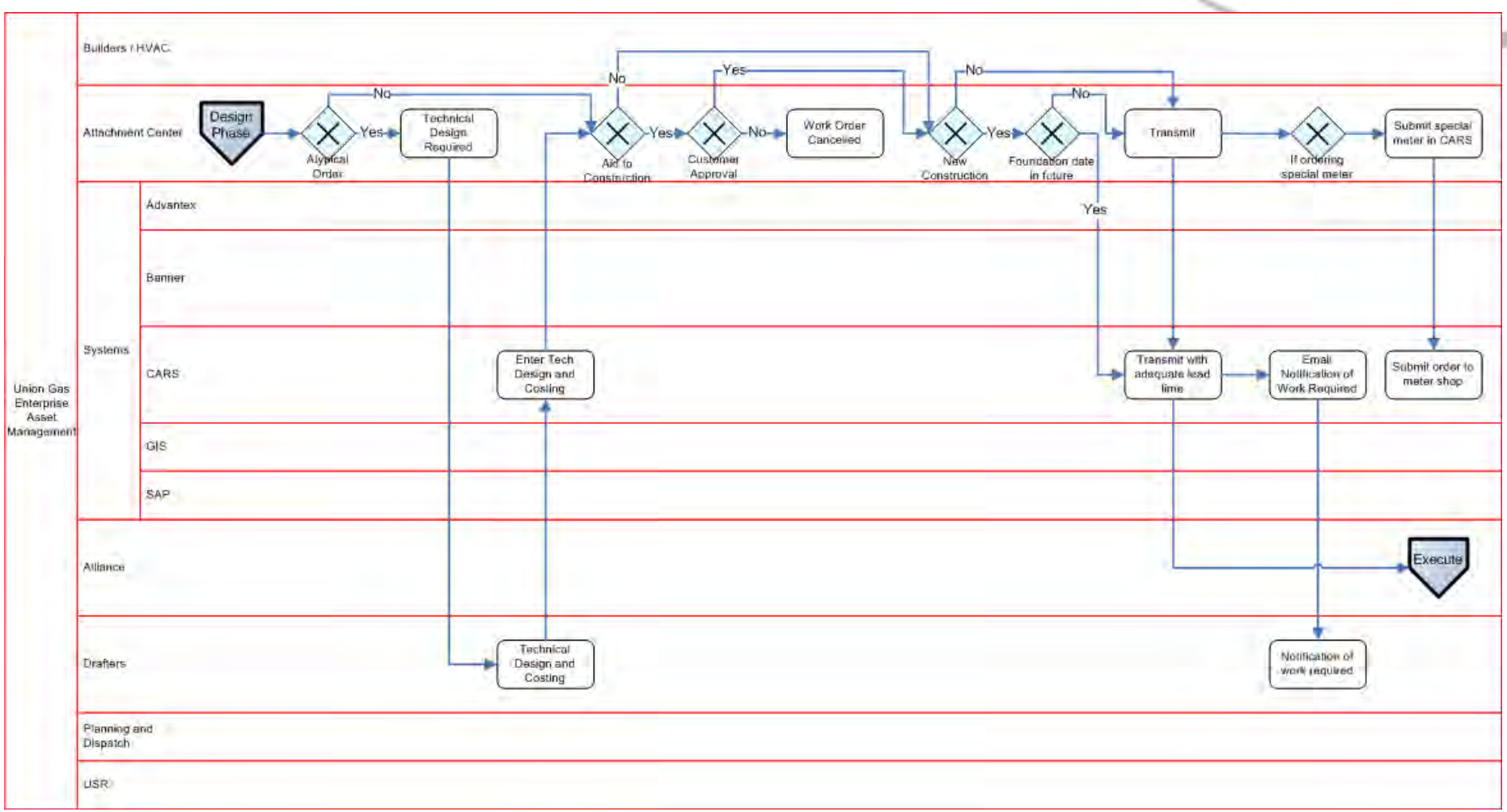



Union Gas Enterprise Asset Management
Asset Management Oversight
Customer Management
Plan Work and Resources
Manage Work
Execute Work
Growth Required
Station Numbering
PFM Validation
Odour Intensity Checkpoint Identification
Distribution Operations SOP Non-Compliance Approvals
Dist. Ops. Non-Compliance Monthly Communication
Isometric Drawing Discrepancy
Monitor Inspections
New Customer
Commercial Meter Request
Plan Commercial Meter
Large Station Design
Valve Inspection Planning
Valve Repair Plan
Manage Commercial Meter Installation
Station Commissioning Planning
Large Station Planning
Large Station Complete
Low Pressure Regulator Inspection Plan
Odour Intensity Checkpoint Installation
Valve Inspection Execution
Low Pressure Regulator Inspection Execute
Build Commercial Meter
Odour Intensity Read
Valve Repair Execution
Excess Pressure Complete
Large Station Construction
Station Commissioning Execution

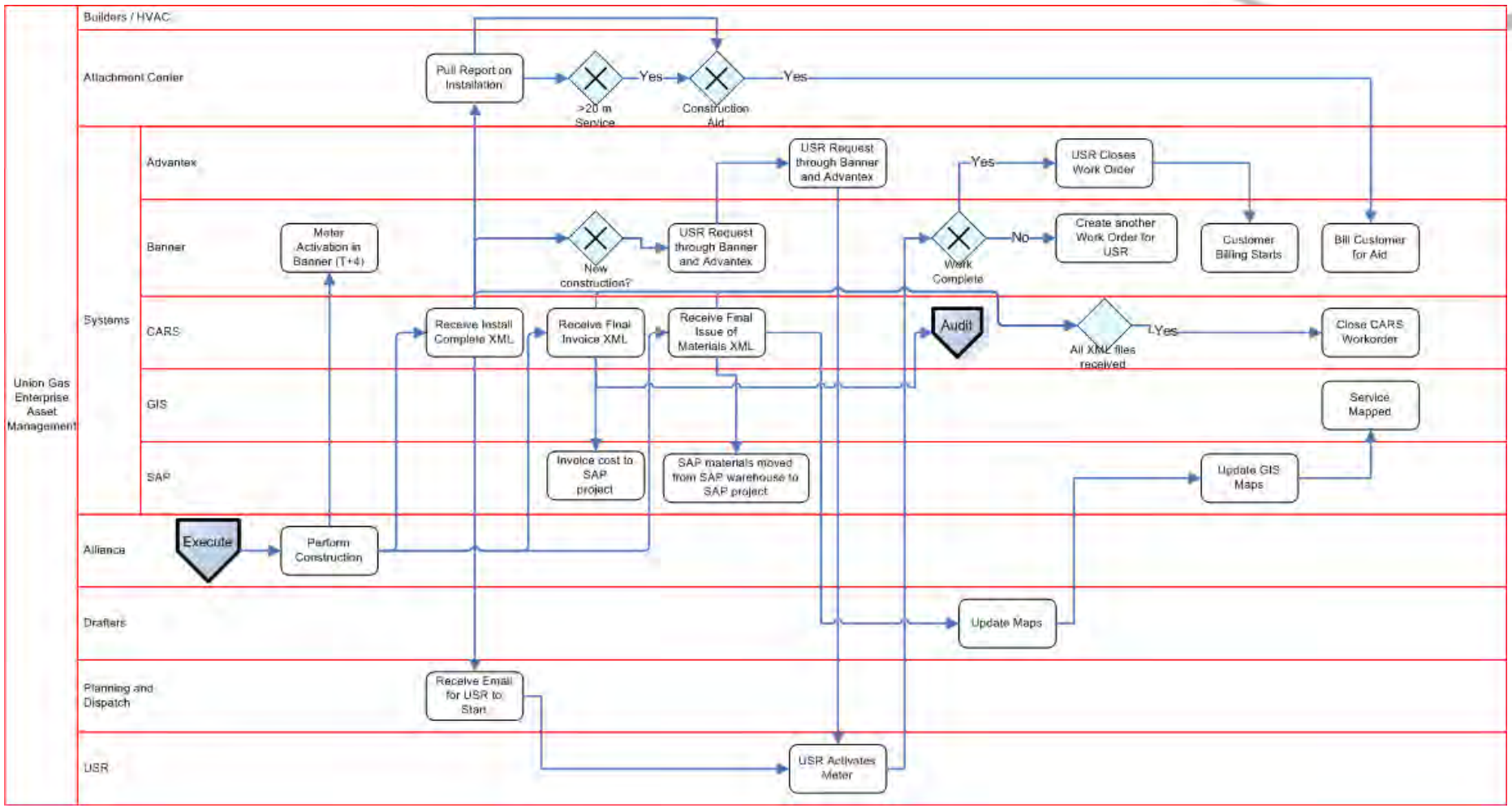
# CARS – Request Phase



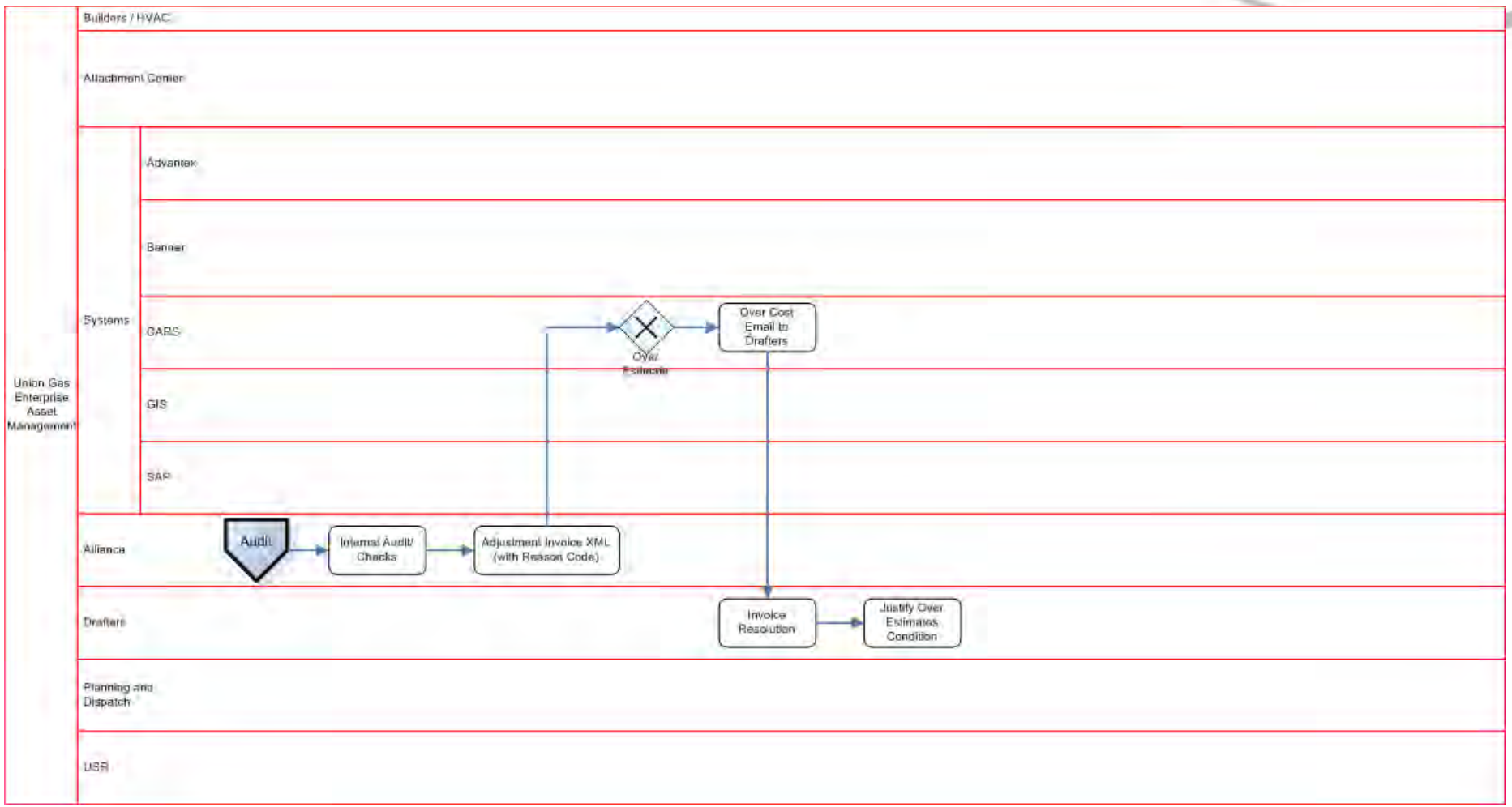
# CARS – Design Phase



# CARS – Execute Phase



# CARS – Audit Phase



# Appendix 5

Interview Summaries

# Corrosion Register

- System:
  - Standalone system – not integrated with any other systems
  - About 15 to 16 years old
  - Contains test point information and test measurements / results from the annual corrosion survey – solely contains pipeline information (a small quantity of other equipment)
  - System interface considered to be “Awkward and cumbersome”
  - Reports when a corrosion reading is required, but manual intervention is required to issue a work order to have the reading completed
  - If a read point is missed by a Corrosion Technician, the system will not flag this occurrence
- Organization:
  - 21 Corrosion Technicians reporting in to District Operations
  - Small Corrosion Engineering department at head office as part of the Engineering Department, including a small analysis team
  - Recent appointment of the companies first Manager, Corrosion Engineering attests to the growing importance of the Corrosion detection program
  - Aging workforce with a high proportion (about 25 personnel) preparing for retirement

# Corrosion Register (continued)

- Process:
  - Field Corrosion Technicians take corrosion measurements and perform the bulk of the corrosion trouble-shooting in the field
  - Engineering will handle complex trouble-shooting issues in collaboration with the Corrosion Technicians
  - Technicians are under constant pressure to complete the annual corrosion survey and don't have time to perform analytical work
  - Internal corrosion testing is performed by devices called "pigs" that are inserted into the pipeline at key junctures and test the pipe from the inside for corrosion, wall thickness, etc.
  - Corrosion readings are often not entered into the register until many weeks after the readings have been taken
  - Despite the availability of synchronizing laptops for field use, technicians tend to use paper in the field and then transcribe the information into the register when they return to the office
  - Whenever a corrosion issue is identified, a risk assessment is performed. Since the a standardized risk assessment has not been developed, two different people might give the same issue a different risk rating
  - Highly dependent on the Technicians to trouble-shoot corrosion issues in the field

# Corrosion Register (continued)

- Master Data:
  - Different corrosion groups are using different terminology for the same information
  - The Corrosion Register is missing a lot of information
  - There isn't a standard way of identifying the installed equipment
  - Mobile corrosion test equipment is not maintained in the system
  - Pipe corrosion sector numbers are only used by the Corrosion program
  - Transmission line numbers are the same as those used in the GIS
- Implications:
  - Highly dependent on very experienced Corrosion Technicians who are preparing to retire
  - Lack of visibility into corrosion issues above the Technician level, because the system does not highlight issues to management and the Technicians will generally trouble-shoot issues independently in the field, unless they require the assistance of Engineering
  - Lots of data contained within the Corrosion Register, but there is a need for automated assistance to flag / predict corrosion issues before they occur, based on the readings in the register
  - There is a need for a standardized corrosion risk assessment program and training course

# Corrosion Register (continued)

- Implications (continued)
  - There is a need for a single corrosion dictionary that defines the terminology that will be used by Union Gas in its Corrosion program
  - A program is needed to scope and close the information gaps within the Corrosion Register
  - There is a need for a standard approach to identifying the installed equipment and locations within the Corrosion Register
  - There is a need to maintain asset information regarding the corrosion test equipment, to ensure that it remains within the company, is calibrated on a regular basis and to provide visibility which could improve response times for trouble-shooting corrosion issues
  - There is a need for a system that defines and tracks the work performed by the Corrosion program

# MISOS

- System:
  - An online record of the equipment contained in the stations and of the gas carrying capacity of the stations
  - Non-gas carrying assets are not addressed by MISOS (e.g. heat tracers), some information is captured in the station attributes (e.g. heat tracer yes / no)
  - MISOS is only able to manage inspection work with inter-inspection intervals less than or equal to one (1) year
  - No central security system with sensors to safeguard remote assets, the only indicator of a problem with the system is a change in gas pressure sensed by the SCADA system (which isn't installed in all stations)
  - MISOS identifies the capacity limiting device in each station. If the capacity limiting asset is not something that would normally be contained within MISOS, it is identified in the MISOS comments
  - Station piping information is not maintained in any system
  - MISOS is integrated with Banner to ensure that all of the meters contained in MISOS are activated in Banner and are therefore available for billing purposes; data validation is performed on a daily basis between Banner and the previous day's MISOS records
  - MISOS contains a calendar-like work scheduling capability
  - Very user friendly interface

# MISOS (continued)

- Organization:
  - About 80 to 90 station technicians across Union Gas
  - MISOS users are very adaptable to new features and functionality, as long as they understand the value of the change
  - Technicians also enter their time into WARP
  - For major projects, WARP and MISOS time are reconciled on an annual basis
- Process:
  - Equipment inspections are conducted on a regularly scheduled basis (each type of equipment has a standard interval between inspections)
  - Station Capacity is not usually an issue, because capacity is normally designed to last for a period of ten (10) years, capacity utilization is monitored regularly, SCADA is set to warn the organization if station utilization is approaching capacity, and should there be an issue, there are Interruptible Gas Customers who can be temporarily shut off in peak periods without ramifications
  - There is no standard approach to data entry, therefore the data contained within MISOS is characterized by significant variability

# MISOS (continued)

- Process (continued)
  - MISOS data is not audited for accuracy
  - Pressure Factor Measurement (PFM) stations have become a regulatory requirement for large customers, to increase the accuracy of billing;  the PFMs are audited annually by Measurement Canada and Union Gas performs manual inspections prior to giving the station audit list to Measurement Canada
  - Engineering needs to check MISOS constantly in order to determine if changes have been made within MISOS
  - Engineering must approve any new station equipment before it can be used in station design and procurement
  - MISOS contains a minor planning and dispatch function that works like a calendar
  - Technicians plan their work in MISOS and the system reports when an inspection has been missed
  - Personal Digital Assistants (PDAs) may be used for data entry in the field and later synchronized with the MISOS in the office
  - There is no process for validating field work

# MISOS (continued)

- Master Data
  - Most of the fields in MISOS are optional and there is no standard approach for completing a MISOS record, therefore there is a lot of variability in the data contained within MISOS
  - Manual data entry by the Station Technicians is prone to error
  - MISOS is currently incapable of performing trend analysis on equipment failures and reliability
  - The data contained in MISOS is structured in a way that makes it challenging to relate data for analysis purposes
  - Data entry is challenging when there are as many as 350 combinations and permutations of parts and configurations for just one regulator type
  - Material numbers from SAP are used in identifying the equipment, but such numbers do not exist for each combination and permutation of highly customizable equipment
  - No land assets are contained in MISOS (e.g. walls, floor, fence, etc.)
  - Test equipment is included in MISOS, even though it is not installed in the stations (e.g. dead weight gauges)
  - Data generally uses the following format:
    - Station number (not always accurate and no standard approach)
    - Equipment type
    - Function (operator, monitor)
    - Type of function

# MISOS (continued)

- Master Data (continued)
  - All assets have unique numbers in MISOS, but there are no nameplates or identification on the equipment in the station, making it challenging to identify specific pieces of equipment
  - Contains all data since 2003 ( the predecessor system ADRS contains 15 years of data)

# MISOS Case Studies

- There are many circumstances in which the information in MISOS becomes outdated. Some examples are shown below:
  - Example 1:
    - A station is specified to run at a certain capacity and a certain size of spring is specified for the station.
    - In actuality, the station runs at a much lower pressure at which the original spring will not operate
    - The spring is changed to a smaller one in the station, but MISOS is not updated
  - Example 2:
    - During an emergency, a station technician inserts an alternative item into a station to solve the immediate problem
    - MISOS is not updated to reflect the substitute item
  - Example 3:
    - Station design might change just before construction, because the required equipment is not in stock
    - The substitute equipment might not be appropriate for the entire year
    - The station technician may forget to update MISOS when the correct equipment is installed

# MAPCON

- System:
  - MAPCON tracks preventive maintenance and repairs and contains high level asset information
  - Foxboro DCS is used to monitor station performance
  - MAPCON doesn't track hours of equipment operation
  - Since MAPCON is not integrated with the SCADA system, it has no source of equipment operation hours (a key metric in determining when to perform preventive maintenance)
  - MAPCON is also unable to track the time required to complete maintenance work
  - Technicians enter their work time into WARP
  - Reports are focused on completing work orders in a timely manner
- Organization:
  - Storage and Transmissions Operations (STO) manage the Dawn site, the Trafalgar system and the LNG site in Hagar
  - The mechanics use a paper-based system for recording their work and then hand the paper to an administrative assistant for entry into MAPCON
  - Technicians have laptops, but since they are not ruggedized, they are left in the office
  - There is an aging workforce, many of whom are not comfortable with automation

# MAPCON (continued)

- Process:
  - Work orders are completed using a paper-based approach
  - Sometimes notes and information are added to the paper work order and these notes and information may be scanned into MAPCON, but they are not searchable. A lot of work would be required to review each work order to find something
  - The person who creates the work order in MAPCON is notified when the work order is closed (when the work has been completed)
  - "Out of service" reports must be manually generated
  - MAPCON does not track equipment warranties
  - 60% of the maintenance work is unplanned and 40% is planned
  - Peak season is November to April
  - There is currently no predictive maintenance
- Master Data:
  - Asset information is contained within MAPCON to the compressor / engine level (large component level)
  - MAPCON has a large number of work codes that need to be streamlined / consolidated

# MAPCON (continued)

- Master Data (continued):
  - Asset Hierarchy within MAPCON
    - 1 – Complete system
    - 2 – Gas generator system
    - 3 – Gas generator Dawn Plant B
    - 4 – Air compressor
  - SAP has part numbers for smaller parts and MAPCON tracks equipment at a high level, therefore there is no overlap between the systems (and potentially a gap in between them)
  - SAP doesn't contain an asset hierarchy
  - MAPCON only contains 1 year of useful data

# CARS

- CARS is the system used for managing capital projects
- CARS helps the performance of equipment installation and subsequent pressure tests
- Adheres to SOX controls for materials and invoicing
- Interfaced with SAP-MM for materials and SAP-AP for invoice payment
- Interfaced with Banner for customer billing
- Interfaced with Advantex for work order issuance to USRs
- Communicates with contractors using fax functionality
- CARS monitors the need for construction permits
- Users must create permits in CARS, once the permits have been received
- Meter Requisition Functionality
  - Can submit requisitions to the meter shop, including for bulk orders
  - Meter shop pulls reports from CARS and issues materials from inventory and / or uses SAP to order materials
  - There is no interface between CARS and SAP

# CARS (continued)

- Associated Staff
  - 40 drafters who develop work orders
  - 30 personnel in the Attachment Center who create work orders for the technicians
- GIS
  - Used when drafters create maps
  - Service replacement template used in GIS
    - Alliance enters required information
    - Drafters validate data
    - Sends off work order to be completed
    - Alliance gets design from drafters through CARS
    - Indicates materials required
  - Drafters must enter data into GIS
    - Then enter the same data into CARS
  - Drafters perform manual reconciliation
    - Design materials reconciled with materials used
    - GIS will reflect what has been installed

# CARS (continued)

- Project Numbers
  - Project ID Format [01 09 0005]
    - First 2 numbers: District number
    - Second 2 numbers: Year
    - Rest of numbers: Project number
      - Created outside CARS
  - Blanket Project numbers used for smaller projects
  - Easy to track projects in SAP
- Reports
  - Head office pulls reports from GIS and SAP
    - Lengths of pipe
      - Reconciled to pay taxes
  - CPrep
    - New business projects and equipment replacement projects
    - Manage and account throughout entire process
    - Have to go between SAP and CARS Reports

# CARS (continued)

- Struggle with keeping track of external changes
  - E.g. Government cancels work
  - CARS has query, but no reports
    - Must use Crystal or Discover and the add a link on the portal
  - Advantex not built for multi-day work, so CARS is used
- Banner Interface
  - CARS → Banner interface
    - When new services and meters created
      - Need to create customers in Banner
      - For every meter, need to create customer in Banner
    - ITRON sends meter reads to Banner
    - Interface creates meters in Banner
      - Set as “Pending”
      - Requires some manual intervention
    - Banner → Advantex R8 Interface
      - Used to create work orders

# CARS (continued)

- Automated emails
  - For work orders
  - SOX controls to Alliance partners
- Microsoft Biztalk used to create the integrations

- Invoicing
  - Need to collect “Aid to Construction”
    - In case project does not meet payback requirements
    - CARS keeps track of project then sent to Banner to invoice customer
  - Contractor sends XML invoice to CARS
    - CARS sends one line to SAP
      - GST and PST is stripped and sent separately
    - To see full info on invoice, users must go to CARS
    - Alliance paid for Time and Materials
  - When pipe put into ground
    - SAP & CARS will indicate all material used including scrap (e.g. 110 m)
    - GIS only shows assets in ground (e.g. 100 m)
    - Scrap found through difference between GIS and CARS (e.g. 10 m)

# CARS (continued)

- CARS was built using .NET technology
- Improvements
  - Districts want to be able to do better project management
    - To see all the work coming up
    - To rebalance work
    - Districts have created work around with MS Project
  - In Progress
    - HST implementation
    - Large queue
    - IS queue also has fixes and enhancements
      - Including database enhancements
- Master Data
  - CARS contains
    - Customer information
    - Materials information
    - Work orders for customers
  - Does not keep track of assets in CARS
  - Uses SAP to determine asset transfer from warehouse to projects
  - CARS tracks materials used
  - SAP tracks financial aspect
  - CARS → Work order → CARS → SAP

# CARS (continued)

- Closing Work Orders
  - Required fields from contractors to close work orders
    - Install complete
    - Issue of materials
    - Invoice
  - In early days CARS had stale open order problems
    - Kevin tracks contractors to ensure orders are being closed
  - Additional stale work orders
    - Builders requesting work
      - But project never starts
      - Work orders just sit in system
    - Larger districts have more stale orders
- Time Reporting
  - CARS does have time reporting
    - No linked to WARP
    - WARP can only input time for 1 person at a time
    - CARS can input for multiple people under one project
  - North manually takes time reports from CARS and enters into WARP
    - Thunder Bay, North Bay, Kingston
    - Effort: One person in each location, 1-2 days per week

# CARS (continued)

- Project Management
  - One capital project to many work orders
  - Time charged to capital projects not to work order
  - CARS number and Project number in CARS
    - SAP only has Project number
- Support
  - 3 – System support people
  - Some developers
  - 3 – Business owners / process managers
  - Contractors
  - Caroline Hayes
  - One other support resource for new services
  - IT helpdesk
- Historical data since 2001
  - All data in 1 operational database
  - Newer records have more detail

# WARP Observations

- System
  - Custom Union Gas application built on modern architecture
  - Can create annual work plans based on activities required
  - Allows for dynamic scheduling of work
- Organization:
  - Work codes unique to each functional group
  - Primary data source for Payroll
  - Almost all Union Gas employees use WARP in some capacity
- Process:
  - Creates annual resource/work plans for many Operations groups
  - Work plans do not automatically feed to dispatch (Advantex)
    - Planners pull reports to manually plan and dispatch USRs through Advantex
  - One goal is to have a tool to effectively plan work
- Master Data:
  - WARP activity time often not checked even though it drives Payroll
  - Time spent on activities not attributed to work orders (except for Utility Services)
  - Employees manually created in WARP from HR information

# WARP Implications

- Interpretation
  - Timesheet function was intended to be universal, but due to enhancements from individual groups, WARP's function became fragmented which limited its integration with other groups and systems
  - Planning could be used for technicians, but due to the lack of integration with maintenance registers it is not possible
  - Most users just use WARP to get paid, with no repercussions if the entered time is incorrect, calling the activity data into question
  - Changes to any part of the application will affect at least ¼ of Union Gas employees, with changes to the time sheet system affecting almost every Union Gas employee

# Advantex R8

- System:
  - Advantex is a planning and dispatching tool that was installed in 2006 for the USRs
  - Advantex is very stable and is considered to be user friendly
  - It can coordinate time-slot customer appointments
  - The work and drive time contained in Advantex is compared to the GPS time for the USR vehicles
  - Advantex is integrated with Banner, GIS, eLocate and WARP (time entry is performed as one logs off of Advantex)
- Organization:
  - 380 to 385 USRs working at Union Gas on any given day
  - Focused on fixing problems within the distribution network, but is a “jack of all trades” in the North, due to the low population density
  - The USRs are an aging workforce
  - There are 6 to 7 USRs per planner

# Advantex R8 (continued)

- Process:
  - Advantex comes equipped with a tool called Workforce Optimization, which helps a planner to plan the work. It can recommend the best resource for each job, based on technical capabilities and work priorities
  - After planning is completed, work plans are issued to USRs in an overnight batch job
  - Work is then sent via the RF radio network or by the Wireless Matrix satellite system to USR laptops in the field
  - Each USR vehicle is equipped with a docking station and antenna for laptop communication
  - Drive times and Reasonable Expectations (RE) are included in the work plans
  - REs are based on 20 years of experience (rural REs are more accurate than remote REs)
  - Advantex uses three (3) job statuses to track the work effectively:
    - On route
    - Arrive
    - Complete
  - If USR runs out of work, sends a message through Advantex or telephones the planner for more work

# Advantex R8 (continued)

- Process (continued):
  - If work isn't completed during the day, the work is re-allocated the next day (may not go to the same USR)
  - Advantex performs map-based dispatching (by address based on the GPS location of the vehicle)
- Master Data
  - Advantex contains the following information:
    - USR skills
    - Location
    - Work zones
    - Name
    - Man number
    - Vehicle number
    - Phone numbers
  - Advantex contains three (3) data storage locations:
    - Operational – used in production
    - Historical – Operational information flushed to the Historical database on a daily basis
    - Data Warehouse – All completed work flushed into the data warehouse

# Advantex R8 (continued)

- Master Data (continued)
  - For regulatory purposes, Advantex maintains information from the last time that a service was touched by a USR
  - Work codes are maintained in Advantex and time entry is performed for each work code, even if multiple work codes are completed on a job

# GIS Observations

- System
  - In a refresh/upgrade cycle
  - Feeds information to multiple high-priority applications (Advantex, IRAS, SynerGEE)
  - Records changes to pipe network (including deletion) and flagging of critical assets
  - Does not keep track of the maintenance status of pipes
- Organization
  - 1200 users
- Process:
  - Processes and system well documented
  - Incorporates required fields and data validation
  - Use of a Continuous Improvement Cycle
  - Valve and Odour inspections automatically feed to Advantex
- Master Data
  - Primary data store of all outside-the-fence pipeline asset information
  - 98% of all GIS data with 95% accuracy
  - ~2/3$^{rd}$ of attributes are auto populated by SAP and CARS
  - GIS governs classification system for all installed pipelines

# GIS Implications

- Interpretations
  - De facto Master Data Management group
  - Well implemented records management for existing assets, lacking only real-time maintenance and operational status of pipelines
  - Crucial integration with work management systems for annual maintenance activities reduces manual intervention
  - Processes in place that ensure that all records are accurate and any errors found are documented as well as corrected

Filed: 2012-05-04
EB-2011-0210
J.B-4-1-13
Attachment 3

# Union Gas Asset Management Strategy Development

Project Charter

September 2011

# Purpose of project

To develop an Asset Management Strategy for Union Gas prior to the Enterprise Asset Management (SAP) technology implementation.

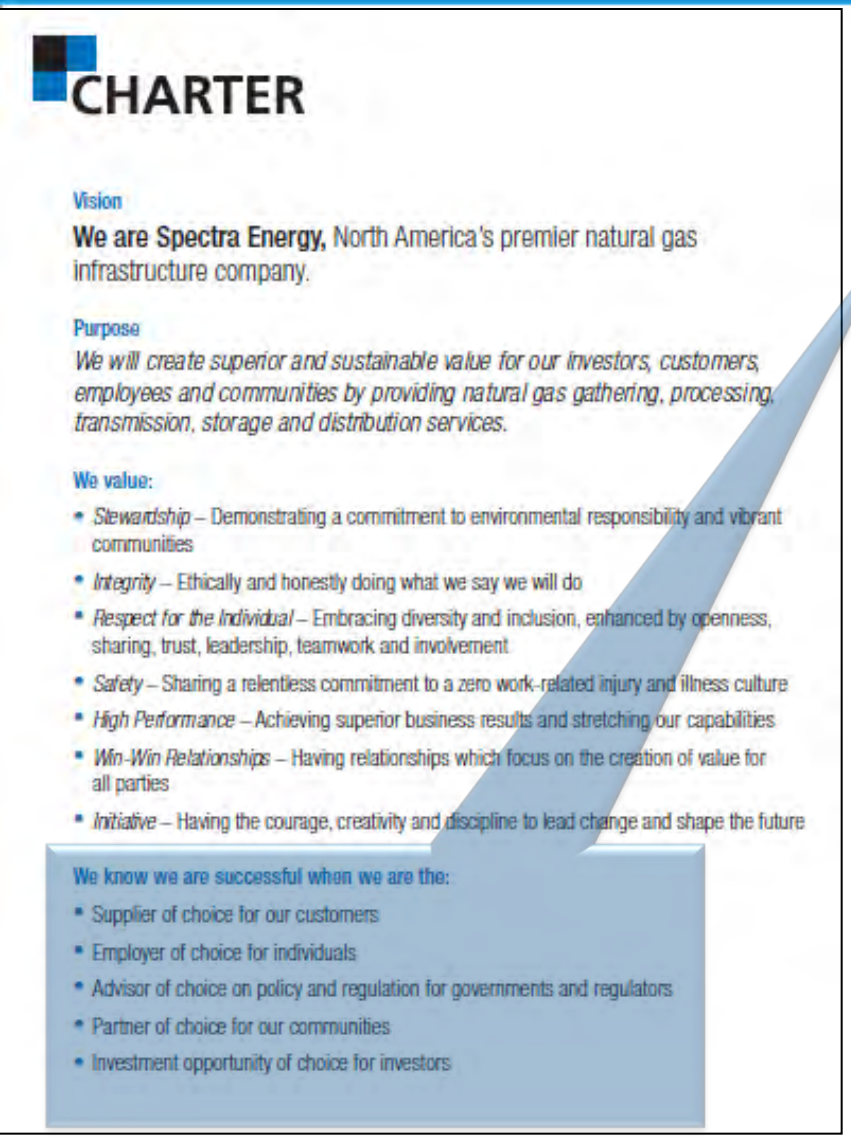
We will accomplish this by:

- Defining our Asset Management program
- Developing the value statement for SAP
- Focusing on risk management
- Ensuring compliance with OMS Element 4 and aligning with the CGA Asset Management guiding document
- Aligning with the Streamline approach

# Background - Drivers for Change

- Technology Drivers – SAP EAM
  - Operational Safety technology foundation
  - Strategic replacement of our asset based systems – some obsolete applications
  - Alignment with Streamline Program
  - Data – request for information and integrity of data
- Other Drivers
  - Operational Safety
  - Risk Management
  - OMS Element 4 – Asset Management
  - CGA Asset Management Guidelines

# Strategic Alignment



CHARTER

**Vision**

**We are Spectra Energy,** North America's premier natural gas infrastructure company.

**Purpose**

*We will create superior and sustainable value for our investors, customers, employees and communities by providing natural gas gathering, processing, transmission, storage and distribution services.*

**We value:**

- *Stewardship* – Demonstrating a commitment to environmental responsibility and vibrant communities
- *Integrity* – Ethically and honestly doing what we say we will do
- *Respect for the Individual* – Embracing diversity and inclusion, enhanced by openness, sharing, trust, leadership, teamwork and involvement
- *Safety* – Sharing a relentless commitment to a zero work-related injury and illness culture
- *High Performance* – Achieving superior business results and stretching our capabilities
- *Win-Win Relationships* – Having relationships which focus on the creation of value for all parties
- *Initiative* – Having the courage, creativity and discipline to lead change and shape the future

**We know we are successful when we are the:**

- Supplier of choice for our customers
- Employer of choice for individuals
- Advisor of choice on policy and regulation for governments and regulators
- Partner of choice for our communities
- Investment opportunity of choice for investors

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- Supplier of choice for our customers
- Employer of choice for individuals
- Advisor of choice on policy and regulation for governments and regulators
- Partner of choice for our communities
- Investment opportunity of choice for investors

# Purpose-Vision-Goals-Culture

strive higher

## PURPOSE

Our energy enhances the quality of life and the prosperity of our customers

## VISION

We will be the pre-eminent provider of natural gas storage services in the Great Lakes basin, while creating highly-valued natural gas delivery services

## GOALS

- Launch and aggressively grow the unregulated storage business
- Deliver high performance in the natural gas delivery business
- Aggressively pursue a regulatory environment that enhances opportunity and eliminates uncertainty
- Build on our high performance culture and position ourselves for the future

## CULTURE

**Safety**
- Relentless commitment to a zero work-related injury and illness culture

**Diversity & Inclusion**
- Respect for each individual
- Encouragement of each employee's unique contribution
- Employees are engaged and feel valued

**Individual Accountability**
- Accountability for personal and team performance
- Personal responsibility for skills growth and development
- Clearly defined accountabilities

**Leadership**
- Giving and receiving High expectations with an emphasis on outcomes
- supportive and challenging feedback

**Results Focus**
- Strategic Key Performance Indicator mindset (KPI)
- Return On Investment mentality (ROI)
- Creativity, innovation and continuous improvement

# Scope of Strategy Development

| What's In | What's Out |
| --- | --- |
| • Asset Management strategic elements – e.g. policy & structure<br>• Key stakeholder engagement<br>• SAP EAM value proposition | • Technology and applications<br>• Work procedures<br>• SAP EAM detailed project plan |

# Project Approach

| Actions | Approach |
|---|---|
| Kickoff meeting | Introduce concepts and develop charter and timeline |
| Engage consultant | To provide SAP and Asset Management expertise |
| Assessment of our current state | Approx 5 day assessment of our current asset management strategy & practices - gap analysis |
| Review consultant report | Detailed report is delivered with findings and recommendations |
| Visit peer companies | Review asset management strategy of other companies |
| Stakeholder workshop | 1-2 day workshop with key stakeholders to round out UG's asset management strategy |
| Strategy endorsement | Review with ULG? |
| SAP Project Plan/Business Case | Build into SAP Project plan |

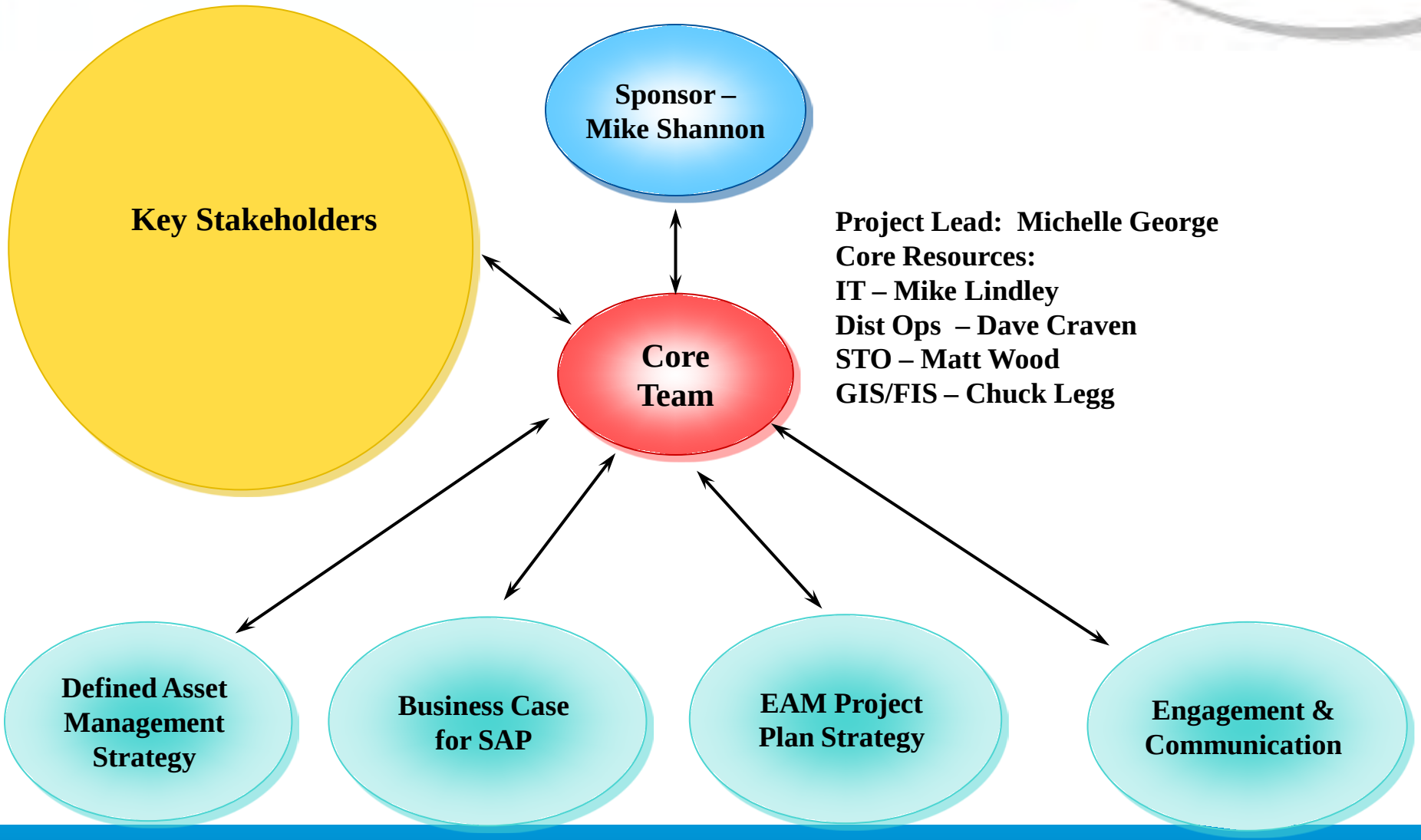
# Deliverables

1. Defined Asset Management Strategy & Program
2. Value statement for SAP EAM
3. Strategic components for SAP EAM project plan
4. Engagement & Communication Plan

# High Level Timelines

| Date | Milestone |
|---|---|
| Sept. 7 | Kickoff |
| mid Sept | Engage consultant |
| Late Oct | 5 day assessment session - break it over 2 weeks |
| Mid Jan | Visit to Fortis BC, SET West |
| Late Jan | 2 day workshop reviewing results |
| Early Q1 | Endorsement of Asset Management Strategy |
| | Communication plan |

# Project Team



# Principles and Assumptions

- EAM solution will add value to Union Gas
- EAM will be one solution
- SAP is the technology solution
- Alignment with:
  - Spectra Energy Values
  - 2012 Of Choice Goals
  - Union Gas OMS Elements

# Risks

- Resources – competing priorities
- Timeline:
  - Needs to be short to ensure focus
  - Integration with Streamline
- Keeping the focus at a strategic level vs. detailed application replacement
- Using PM (Plant Maintenance) in a utility environment vs. a manufacturing facility

# Critical Success Factors

- Strategy to apply to both STO & Distribution Operations
- Leadership support
- Alignment with SE Streamline Operations
- Organizational readiness – different levels of readiness in different functions


# strive higher

FOR THE ENERGY IN YOU

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 7/Pg 5

Union states that "EAM will supply information that will increase Union's ability to manage costs, increase the productivity of each asset and ultimately increase efficiency".

a) Please provide all Union documents that discuss and/or quantify EAM's potential for managing costs and increasing the productivity and efficiency of assets.

b) Have any of these cost and productivity savings been reflected in Union's proposed capital expenditures in Exhibit B? Please explain.

---

**Response:**

a) Please see the response at Exhibit J.B-4-1-13 e).

b) The costs are included in the IT capital budget. The productivity savings will help Union achieve the 1% productivity improvement target included in the 2012 and 2013 financial forecast as described on page 3 of Exhibit A2, Tab 3, Schedule 1.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh B1/Tab 2/Appendix A

Union provided the capitalization policy in the Appendix A of Exhibit B1 Tab 2.

a) Has Union conducted a capitalization review and comparison with other gas distributors; either in Canada or US? If so, please provide Union's internal analysis and review. If no review has been conducted, please provide reasons.

b) Does Union have a plan to conduct a capitalization review and comparison with respect to other gas distributors; either in Canada or US? If so, please provide details for the plan. If no, please provide reasons.

---

**Response:**

a) A full capitalization policy review was not conducted. Union prepared its capitalization policy using US GAAP accounting standards, in conjunction with the Ontario Energy Board's Uniform System of Accounts for Class A Gas Utilities.

   Although a full review was not conducted, Union analyzed the minimum capitalization rule policy for 6 Canadian gas and electric companies. Union's minimum rule of $1,000 is consistent with the companies examined. Please see Attachment 1 for details of the review.

b) No, Union does not plan to conduct a capitalization review. Union's capitalization policy is supported by the standards noted in part a) and no further review is required.

| Company | Minimum Rule |
|---|---|
| Alta Gas | $500 – General Plant |
| Hydro Ottawa | $500 – Distribution Plant<br>$200 – General Plant<br>$1,000 – Grouped Assets |
| Toronto Hydro | Minimum rule not specified in document reviewed |
| ATCO Gas | Mains > 2m length<br>Services – all capital<br>Structures & Improvements > $2,500<br>Leasehold Improvements > $2,500<br>M&R Equipment > $500<br>Office Furniture & Equipment > $350<br>If not specified above > $2,500 |
| Enbridge | $200 - Structures & Improvements<br>$300 – Compressor Equipment<br>$500 – Office Furniture & Equipment<br>$1,000 – Heavy Work Equipment<br>$500 – Tool and Work Equipment<br>$200 – Communication Equipment<br>$500 – Computer Equipment |
| Hydro One | $50,000 – Transmission Stations<br>$50,000 – Transmission Line Sections<br>$10,000 – Communication Line Sections, Stations or Systems<br>$5,000 – Distributing Stations or Line Sections<br>$5,000 – Administrative or Service Buildings<br>$2,000 – Minor Fixed Assets<br>$2,000,000 – Administrative Application Software |

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit A2, Tab 4, pages 5-6

a) What is the forecast volume of base LPG gas for 2012 and 2013?

b) What was the corresponding actual volume of base LPG in 2007 through 2011?

c) When does Union propose to stop the quarterly revaluation and keep the base LPG recorded at historical cost?

d) What is the historical cost proposed by Union for 2013?

e) What is the cost for 2013 if the LPG is valued based on the most recent quarterly revaluation?

---

**Response:**

a) 2012 – 1,321,700 GJ
2013 – 1,327,400 GJ

b) 2007 – 1,673,300 GJ
2008 – 1,685,800 GJ
2009 – 1,696,400 GJ
2010 – 1,322,800 GJ
2011 – 1,320,300 GJ

c) December 31, 2012.

d) Union will fix the current base LPG at the prevailing weighted average cost of gas (WACOG) rate at the time the quarterly revaluations end.

e) The historical cost for the base LPG at the most recent quarterly valuation is $6.2 million based on a WACOG rate of $4.665/GJ.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B3, Tab 1, Schedule 1

a) Please identify the line items in Schedule 1 that are impacted by the gas cost forecast.

b) Please identify the gas cost forecast used in Schedule 1.

c) Please update Schedule 1 to reflect the most recent gas cost forecast available.

---

**Response:**

a) The following lines are impacted:

Line 4 – Cash working capital.
Line 5 – Gas in storage and line pack gas.
Line 7 – ABC Receivable (gas in storage).

b) The gas cost forecast was based on a WACOG of $5.37/GJ.

c) Please see Attachment 1.

UNION GAS LIMITED
Statement of Utility Rate Base
Calendar Year Ending December 31

| Line No. | Particulars ($000's) | Forecast 2013 (a) | Forecast 2012 (b) | Difference (c) |
|---|---|---|---|---|
| | Gas Utility Plant | | | |
| 1 | Gross plant at cost | 6,374,263 | 6,208,863 | 165,400 |
| 2 | Less: accumulated depreciation | 2,753,674 | 2,640,170 | 113,503 |
| 3 | Net utility plant | 3,620,590 | 3,568,693 | 51,897 |
| | Working Capital and Other Components | | | |
| 4 | Cash working capital | 19,848 | 31,130 | (11,282) |
| 5 | Gas in storage and line pack gas | 136,380 | 133,928 | 2,452 |
| 6 | Balancing gas | 72,963 | 72,963 | - |
| 7 | ABC receivable (gas in storage) | (39,275) | (40,954) | 1,679 |
| 8 | Inventory of stores, spare equipment | 29,618 | 30,369 | (751) |
| 9 | Prepaid and deferred expenses | 4,955 | 5,066 | (111) |
| 10 | Customer deposits | (48,231) | (48,149) | (82) |
| 11 | Customer interest | (764) | (764) | - |
| 12 | Total working capital and other components | 175,494 | 183,589 | (8,095) |
| 13 | Total rate base before deduction of accumulated deferred income taxes | 3,796,084 | 3,752,282 | 43,802 |
| 14 | Accumulated deferred income taxes | 69,686 | 84,971 | (15,285) |
| 15 | Total rate base | 3,726,398 | 3,667,311 | 59,086 |

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Tab 9 [Parkway West Section 5]

No capacity created by the LCU protection at Parkway will be sold as firm transportation capacity. The facilities are proposed to be completed for November 1, 2014 at a cost of $120 million.

a) Please explain in quantitative terms how much capacity will be created at Parkway and describe the constraints preventing Union from selling firm capacity.

b) Please provide by year 2014 – onward the Additional Revenue from the Parkway West Project and Provide a Revenue Requirement 2012- forward calculation and 20 year cash flow (discounted).

c) Show separately by year the Loss of revenue from Kirkwall and provide the projected total net revenue for the Dawn-Parkway System 2012-2022.

---

**Response:**

a) Please see the response at Exhibit J.B-1-7-11 a).

b) Please see the response at Exhibit J.B-1-7-11 a) and J.B-1-7-16.

c) Please see Exhibit C1, Tab 3, Schedule 2, line 10 for the loss of revenue from Kirkwall.

Please see Exhibit C1, Tab 3, Schedule 2, line 7 and Exhibit C1, Tab 3, Schedule 5, Lines 3, 5 and 6 for the forecasted revenues for 2012 and 2013.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Ref: Exhibit B1, Summary, Schedule 2, Page 1 of 10 &
Exhibit B3, Tab 2, Schedule 4

Please provide the Status of all Leave to Construct Applications related to the 2013/2014 listed Transmission Capital projects. Include Date of Application, Docket No and projected Date of OEB Order(s).

---

**Response:**

Of the projects related to the 2013/2014 listed Transmission Capital Projects, only the Owen Sound Replacement and Parkway West Header construction require Board Leave to Construct Approval. The current schedule to submit these applications to the Board is listed below.

| Projects | LTC Application Submission Date |
|---|---|
| Parkway West Headers (2014) | Q3/Q4 2012 |
| Owen Sound Replacement | Q4 2012 |

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: B1 T1 Table 1 page 1

Please add columns to show actuals for each year 2007-2009 inclusive.

---

**Response:**

Please see Attachment 1.

UNION GAS LIMITED
Statement of Utility Rate Base
Calendar Year Ending December 31

| Line No. | Particulars ($000's) | Board Approved 2007 | Actual 2007 | Actual 2008 | Actual 2009 | Actual 2010 | Actual 2011 | Forecast 2012 | Forecast 2013 |
|---|---|---|---|---|---|---|---|---|---|
| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) |
| | Gas Utility Plant | | | | | | | | |
| 1 | Gross plant at cost | 5,170,809 | 5,145,936 | 5,448,662 | 5,696,516 | 5,839,769 | 5,998,663 | 6,208,863 | 6,374,263 |
| 2 | Less: accumulated depreciation | 2,014,712 | 2,012,800 | 2,132,365 | 2,257,113 | 2,374,895 | 2,505,353 | 2,640,170 | 2,753,674 |
| 3 | Net utility plant | 3,156,097 | 3,133,136 | 3,316,297 | 3,439,403 | 3,464,874 | 3,493,309 | 3,568,693 | 3,620,590 |
| | Working Capital and Other Components | | | | | | | | |
| 4 | Cash working capital | 32,672 | 30,724 | 31,354 | 29,958 | 30,505 | 31,678 | 31,784 | 20,007 |
| 5 | Gas in storage and line pack gas | 188,792 | 158,726 | 132,045 | 129,556 | 167,629 | 150,999 | 154,168 | 156,991 |
| 6 | Balancing gas | 129,618 | 129,618 | 127,752 | 128,148 | 94,338 | 79,764 | 72,963 | 72,963 |
| 7 | ABC receivable (gas in storage) | (53,791) | (62,901) | (68,198) | (72,892) | (46,774) | (55,323) | (46,329) | (44,901) |
| 8 | Inventory of stores, spare equipment | 28,469 | 31,035 | 27,180 | 28,734 | 29,238 | 28,465 | 30,369 | 29,618 |
| 9 | Prepaid and deferred expenses | 2,741 | 3,233 | 2,317 | 3,470 | 4,341 | 5,080 | 5,066 | 4,955 |
| 10 | Customer deposits | (43,902) | (49,859) | (63,688) | (61,710) | (56,816) | (50,281) | (48,149) | (48,231) |
| 11 | Customer interest | (300) | (438) | (515) | (541) | (622) | (736) | (764) | (764) |
| 12 | Total working capital and other components | 284,299 | 240,138 | 188,247 | 184,723 | 221,838 | 189,646 | 199,108 | 190,638 |
| 13 | Total rate base before deduction of accumulated deferred income taxes | 3,440,396 | 3,373,274 | 3,504,544 | 3,624,126 | 3,686,712 | 3,682,955 | 3,767,801 | 3,811,228 |
| 14 | Accumulated deferred income taxes | 169,502 | 170,560 | 156,777 | 141,274 | 116,410 | 99,698 | 84,971 | 69,686 |
| 15 | Total rate base | 3,270,894 | 3,202,714 | 3,347,767 | 3,482,852 | 3,570,303 | 3,583,258 | 3,682,830 | 3,741,542 |

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: B1 T2 Table 1 page 1

Please expand this table by adding Union's internally forecasted/budgeted capital spending for each year 2007-2011 inclusive.

---

**Response:**

Please see the response at Exhibit J.B-1-2-2.

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: B1 T2 page 2

The updated evidence states that the actual 2007 utility rate base was $68.2M less than the Board approved 2007 rate base of $3,270.9M. Please provide the amount by which the revenue requirement would have been lower in 2007 had the approved rate base been $68.2M less than the amount actually approved.

---

**Response:**

Of the $68.2 million reduction in rate base between 2007 Board-approved and actual results, $23 million was due to net utility plant, $30 million due to gas in storage with the remaining $15 million due to other working capital components. Price fluctuations due to the changing gas cost forecast go through the deferral account ($0.2 million). The revenue requirement would have been further reduced by $4.1 million.

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: B1

Please provide the approved (by Spectra) capital budgets for each year 2007-2011 inclusive.

---

**Response:**

Please see Attachment 1.

Union Gas Limited
Spectra Approved Budget

| Line No. | Particulars ($ millions) | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| 1 | Storage | 6.6 | 6.1 | 3.0 | 19.2 | 37.4 |
| 2 | Transmission | 110.6 | 67.9 | 52.7 | 27.3 | 51.1 |
| 3 | Distribution | 91.6 | 112.8 | 93.3 | 99.0 | 116.5 |
| 4 | General | 34.3 | 29.4 | 24.7 | 28.9 | 38.0 |
| 5 | Overhead | 59.4 | 57.3 | 60.9 | 65.6 | 51.8 |
| 6 | Total | 302.5 | 273.5 | 234.6 | 240.0 | 294.8 |

* Note - The Spectra Board Approved Budget includes the projects that have a regulated and unregulated component and excludes all unregulated projects.

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: A2 T3 S1, page 8

Please provide any differences between the capital budgets submitted for Senior Management Review and Approval and the final capital budget approved for each year 2007-2013 inclusive.

---

**Response:**

Attachment 1 identifies by budget cycle the differences between the capital budget submitted for Senior Management Review and Approval and the final capital budget approved for years 2011-2013. This information is not available for years 2007-2010 inclusive.

# 2011 - 2012 Budget Cycle ( $ Millions)

## 2011 Budget Cycle

| | 2011 | |
|---|---|---|
| Budget Submitted | 298 | |
| July 29th Review | 0 | |
| August 12th Review | 2 | Addition of Supply Excellence project. |
| August 24th Review | -5 | Removal of the Corporate Aircraft. |
| Final Approval Budget | 295 | |

## 2012 Budget Cycle

| | 2012 | 2013 |
|---|---|---|
| Budget Submitted | 281 | 376 |
| August 4th Review | 0 | 0 |
| August 19th Review | 0 | 0 |
| August 29th Review | 0 | 0 |
| September 20th Review | 0 | 0 |
| Final Approval Budget | 281 | 376 |

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: General

Please provide the impact on the revenue deficiency of a decrease in 2013 rate base of $10M.

---

**Response:**

A $10 million decrease in 2013 rate base would decrease the revenue deficiency by $0.9 million.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 1, page 2

Rate base growth from 2007 to 2013 is $470.6 million. Gross plant has increased by $1.2 billion over 2007. Please identify the largest components of that increase.

---

**Response:**

Please see Attachment 1 for additions from 2008 - 2013.

Summary - Major Gross Plant Additions 2008 to 2013

| Project / Program | In-Service | $ Millions |
|---|---|---|
| Underground Storage Projects | | |
| Dawn Plant J | Sep-11 | 22.9 |
| Total Underground Storage Projects | | 22.9 |
| | | |
| Transmission Projects | | |
| Parkway B | Jan-08 | 79.6 |
| Strathroy to Lobo | Oct-07 | 1.9 |
| Bright Retrofit / Re-Aero | Dec-08 | 83.0 |
| Integrity Management Program | Ongoing | 42.1 |
| West GTA (Halton Hills) | Aug-09 | 27.7 |
| Lobo A & B | Dec-11 | 45.5 |
| Owen Sound Replacement | Dec-13 | 19.1 |
| Total Transmission Projects | | 298.9 |
| | | |
| Distribution Projects | | |
| Hamilton Service Centre | Nov-13 | 30.6 |
| Burlington Service Centre | Apr-08 | 17.3 |
| Windsor Service Centre | Jun-09 | 24.1 |
| Kingston Service Centre | Oct-09 | 16.4 |
| Fort Frances Replacement | Ongoing | 10.6 |
| Thunder Bay Power Plant | Nov-13 | 29.0 |
| New Business | Ongoing | 233.4 |
| Meter and Regulator Replacements | Ongoing | 69.8 |
| Municipal Main Replacements | Ongoing | 86.2 |
| Service Replacements | Ongoing | 11.6 |
| Total Distribution Projects | | 529.0 |
| | | |
| General | | |
| Transportation Replacements | Ongoing | 43.2 |
| ITE Project | Ongoing | 38.0 |
| Total General Projects | | 81.2 |
| | | |
| Major Components of Increase in Gross Plant | | 932.0 |

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada PipeLines Limited ("TCPL")

Reference: Exhibit B1, Tab 1

Preamble: TransCanada seeks to better understand facilities that are included in rate base.

a) For:
   i) All pipeline segments with an outside diameter of NPS 12 or larger; and
   ii) Any distribution line serving industrial customers or power generators with an outside diameter of NPS 4 or larger.

   Please identify all facilities or portions of facilities that, in any of the last 10 years (2002 through 2011) have experienced:

   i) Less than 80% utilization of capacity on an annual basis;
   ii) Less than 60% utilization of capacity on an annual basis;
   iii) Less than 40% utilization of capacity on an annual basis;
   iv) Less than 20% utilization of capacity on an annual basis.

b) Please provide a table listing the capacity expansions of the Dawn-Parkway system since 2002, including:
   i) the type of expansion (compression or looping);
   ii) the specific facilities involved in the expansion (e.g. new x h.p. compressor at Bright, x km NPS 48 loop from Brooke to Strathroy, etc.);
   iii) the capacity created by the expansion;
   iv) the capital costs of the expansion; and
   v) the volumes and terms of the incremental contracts associated with the expansion.

---

**Response:**

a) All of Union's distribution and transmission facilities included in approved rate base are sized to meet peak day demand under design day conditions. Accordingly, the utilization of Union's distribution and transmission facilities will be less than 100% unless Union is experiencing a design day.

b) Please see the response at Exhibit J.G-10-10-3.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Ref: Exhibit B1, Summary Schedule 1

Please provide an exhibit that broadens Exhibit B1, Summary Schedule 1 to include 2007, 2008 and 2009 Actuals between Columns (a) and (b) of that Exhibit.

---

**Response:**

Please see the response at Exhibit J.B-4-4-1.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit A2, Tab 1, Schedule 1, page 3

Please provide a detailed breakdown of the updated figure $20 million listed as "Rate Base Growth Net of Tax Changes and Debt Costs".

---

**Response:**

| Line No. | Particulars ($Millions) | |
|---|---|---|
| 1 | Common equity | |
| 2 | Debt costs and preferred equity | (10) |
| 3 | Add back change in short-term debt to proposed equity structure change | 2 |
| 4 | Depreciation | 23 |
| 5 | Other financing | 1 |
| 6 | Property & capital tax | (4) |
| 7 | Income tax | (11) |
| 8 | | 20 |

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit B1, Tab 2, Appendix, page 13

Please confirm that the Applicant closes capital assets to regulatory rate base when they are available for use, even if they are not actually "used and useful" for regulatory purposes. Please provide a list of all capital assets in that category as of December 31, 2011.

---

**Response:**

Confirmed. On page 13 of Union's Capitalization Policy, it states that depreciation commences in the year that the asset or component is considered available for use (i.e. placed into service). In-service is further defined in the policy on page 7. There are certain factors to consider in determining whether a project is in-service, including whether or not gas is flowing to the pipeline. Union's construction practises are such that there is not a significant delay between completion of construction and use of the asset. Union considers all of its assets to be used or useful. The listing requested is not available.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit B1, Tab 1, Table 4, Updated

a) What is driving the increase in gas in storage and line pack gas in 2012 and 2013 relative to the actual 2011 level? Please disaggregate the increase into the component due to the change in volume and the change due to a change in the cost of gas.

b) Please explain the increase noted in (a) above in relation to the reduction shown for balancing gas.

c) Please explain the change in ABC Receivables (gas in storage) shown for 2012 and 2013 relative to the actual level for 2013. Please disaggregate the change into components related to the volume of gas in storage and the cost of the gas.

d) Please explain the reason for the increase in the value of inventory of stores and spare equipment forecast for 2012 and 2013 relative to the levels recorded in 2010 and 2011.

e) Please explain the reduction in customer deposits of about $2 million in 2012 and 2013 relative to the actual level for 2011.

---

**Response:**

a) The increase in gas in storage and line pack gas is a result of a higher average volume of gas in storage over the calendar year, priced at the applicable reference price. A volumetric increase from 2011 is driven by 2 main factors:

1. actual weather in the winter of 2010/11 was colder than normal and therefore drove inventory levels down below normal for the first part of 2011.
2. Union's sales service base has been growing due to return to system from direct purchase and therefore there is a requirement for higher levels of gas in storage for system customers offset by the requirement for balancing gas for direct purchase customers.

| | 2012 | 2013 |
|---|---|---|
| Volume variance to 2011 | 14.5 | 17.3 |
| Price variance to 2011 | (11.3) | (11.3) |
| Total variance to 2011 | 3.2 | 6.0 |

b) One of the main drivers for the increase to gas in storage is directly related to the decrease in balancing gas. The need for an adjustment between balancing gas and system gas in storage is reviewed annually and if necessary dependant on direct purchase's requirement for balancing gas a transfer is made to/from system gas in storage from/to balancing gas.

c) The 2011 ABC Receivables represent actual consumption and gas vendor prices whereas the 2012 and 2013 ABC Receivables are calculated using weather normalized consumption and a forecasted gas vendor price. The result is a $9.0 million variance between 2011 and the 2012 forecast. $3.5 million of this variance is due to the colder than normal weather in early 2011 that drove increased consumption by consumers, which then increased the amount payable to the gas vendors during that time period. Also during 2011 the average gas vendor price decreased by 10.5%. This accounts for the remaining $5.5 million of the variance which is due to a forecasted reduction in gas vendor prices in 2012.

   The $1.5 million reduction from 2012 to 2013 is due to lower consumption based on the new weather normal model used in 2013.

d) The value of inventory of stores and spare equipment is higher in 2012 and 2013 relative to 2010 and 2011 due to increased costs as a result of inflation and the write-off of obsolete parts related to a decommissioned compressor late in 2011 and not reflected in the 2012 and 2013 forecast.

e) Customer deposits are forecast to decrease as result of greater participation in Union's Equal Billing Plan and Automatic Payment Plan. Customers that participate in both plans are not required to provide a customer deposit. The average amount of the customer deposit is also expected to decline as a result of decline in the commodity portion of the bill due to lower gas prices.

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: B1 T1 Table 4, page 6

a) Please describe fully the methodology used in forecasting customer deposits.

b) Please provide the interest rate paid on customer deposits.

c) Please explain why customer deposits are forecasted to be significantly less in 2012 and 2013 than in 2010 and 2011.

---

**Response:**

a) The number of customers with deposits is estimated by month based on past experience adjusted for customer additions. The average deposit is based on actual deposits for the current year and prior year experience, in this case between January 2010 and June 2011. These two figures are multiplied to obtain a monthly balance which is then converted to a rate base figure using the average of monthly averages.

b) A rate of 0.75% is paid on customer deposits.

c) Customer Deposits are decreasing due to a reduced number of customers and a declining deposit as a result of the reduction in the cost of gas.

UNION GAS LIMITED

Answer to Interrogatory from
Consumers Council of Canada ("CCC")

Ref: Exhibit B1, Tab 1, page 6

Please explain why there was a significant decrease in customer deposits from 2010 to 2011-2013. Please explain why there has been a decline in 2013 of ABC receivables of $8.9 million.

---

**Response:**

For customer deposits please see the response at Exhibit J.B-5-4-1.

The decline in the ABC Receivable balance is due to reduced volume related to fewer customers and a lower cost of gas. This is partially offset by a corresponding decrease in deliveries from the gas vendors.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-Housing Providers of Ontario ("FRPO")

Ref: Exhibit A2, Tab 4, pages 5-6

Accounting for Line Pack Gas: Union states "Union does not expect any material impact to utility earnings as a result of changing the accounting for base LPG."

a) What cost was used to move the gas to Property, Plant and Equipment?

b) Please summarize all changes to accounting and associated ratemaking as a result of this change.

---

**Response:**

a) The cost included in Property, Plant and Equipment (PP&E) for line pack gas (LPG) is the prevailing weighted average cost of gas (WACOG) and continues to be revalued quarterly. Union is proposing to fix the historical cost of the current LPG at the prevailing WACOG rate upon approval by the Board to remove base LPG from the quarterly revaluation process. Based on the WACOG of $5.37/GJ used in the 2013 forecast the value of line pack gas transferred is $9.452 million.

b) The value of LPG included in PP&E will change from being revalued quarterly to being fixed at the historical cost for accounting purposes. For rate making purposes, LPG will still remain a component of rate base however, changes in WACOG will no longer impact rate base with respect to LPG.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exh A2/ Tab 2/ Pg.3

As part of the settlement agreement in EB-2010-0039, Union hired an independent consultant Black and Veatch (B & V") to review Union's cost allocation methodologies. Union filed the consultant's report in EB-2011-0210. Please answer the following questions with respect to the B&V report:

a) In the report, B&V made certain recommendations. Please confirm that Union has adopted all the recommendations. Also, describe the changes that have been made to cost allocations as a result of the report. Please provide a detailed response.

b) In its report, B&V recommended that Union should derive a revised cost allocation factor for the allocation of Union's vehicles and heavy equipment used in its Dawn storage and transmission operations to its unregulated storage operations. Please describe the changes made to the cost allocation factor as a result of this recommendation.

c) Please provide the impact on ratepayers/utility operations as a result of the B&V report.

---

**Response:**

a) Both recommendations 1 and 2 in the B&V report deal with establishing more robust documentation and providing readers with more clarity and supporting references. Union has implemented these recommendations in the 2010 and 2011 Earnings Sharing & Disposition of Deferral Accounts and Other Balances submissions.

Recommendation 3 recommended that Union revise the allocation factor used for vehicles and heavy work equipment. This recommendation has not been implemented or reflected in evidence submitted. Union felt it was prudent to wait for the Board's approval of our unregulated cost allocation methodology in EB-2011-0038 prior to implementing this recommendation as the change proposed shifted dollars out of the unregulated operation back to the regulated operation. Board approval was received on January 20, 2012 in EB-2011-0038 so Union intends to adjust the vehicle and heavy work equipment allocation factor starting in 2012 on a prospective basis.

Recommendation 4 was to prepare two storage adjustments that were identified during the B&V review. These adjustments were made by Union during 2011.

No changes were made to cost allocations as a result of this report.

b) Please see the response at a) above.

c) Allocations did not change as a result of the B&V report and consequently there is no impact to the ratepayer.

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: A2, T2, page 7

Please explain how working capital is allocated to unregulated operations.

---

**Response:**

Refer to Exhibit A2, Tab 2, Page 7 of 8, "Working Capital" for an explanation of how working capital is allocated to unregulated operations. The regulated allocation of cash working capital is based on regulated O&M and cost of gas only. As a result, an allocation to unregulated operations is not required.

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: A2 T2 page 6

a) Please explain how the 37.7% storage and deliverability allocator for allocating costs to Union's unregulated operations are determined?

b) Does the 37.7% allocation reflect current allocation and usage of assets?

c) What is the impact on the deficiency of changing this allocator from 39.2% to 37.7%?

---

**Response:**

a) In the Board-approved 2007 cost study, Union's ex-franchise storage operations were allocated 45.3% of Union's storage space and 39.2% of Union's deliverability. Adjusting the Board-approved 2007 cost study for the NGEIR decision resulted in Union's unregulated storage operations being allocated 40.2% of Union's storage space and 35.1% of Union's deliverability. The average of the adjusted storage space and deliverability resulted in an unregulated factor of 37.7% ((40.2% + 35.1%) / 2).

b) No, the 37.7% allocation factor applies to assets in existence at the time of the NGEIR decision.

New storage assets with new capacity added since the NGEIR decision were allocated 100% to unregulated storage operations. The combination of existing and new assets allocated to unregulated storage operations reflects the current use of assets for unregulated storage services.

c) 39.2% was the 2007 Board Approved Storage Deliverability allocator (EB-2005-0520). This allocator was determined based on 92.1 PJ being required for in-franchise customers. The NGEIR decision (EB-2005-0551) required Union to reserve 100 PJ for in-franchise customers. The Storage Deliverability allocator was adjusted to 35.1% to reflect this requirement.

This approach was approved by the Board in its EB-2011-0038 decision.

Adjusting the allocator from 39.2% to 37.7% is not appropriate.

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Ref: A2 T2 page 8

Does use of compressor fuel correlate more closely with storage volumes or rather with the frequency of injections or withdrawals and with average volumes withdrawn and injected? Please explain.

---

**Response:**

In Exhibit A2, Tab 2, Page 8, the references to the "forecast volume" of storage refers to the forecast activity for injections and withdrawals.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-Housing Providers of Ontario ("FRPO")

Reference: Exhibit C1, Tab 6

From the overrun figures provided in Appendix A, please provide the total penalty that Union Gas would charge a third party shipper for an Unauthorized Storage Overrun as depicted in October of 2011. Please include both the space and deliverability penalties recognizing that injections were still occurring on days when the non-utility inventory was greater than 100% of its allocation.

---

**Response:**

In October of 2011, Union did find that the non-utility storage balance exceeded its entitlement by 2%. Union worked quickly to execute a mitigation plan to reduce the non-utility balance to below 100% of entitlement. Union purchased services from third party service providers and withdrew the equivalent of 2.5% of its maximum non-utility storage balance at a cost of $1.1 Million.

To the extent that a customer is in a similar situation and is able to communicate and execute their mitigation plan immediately, Union would work with the customer to not apply penalty charges.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit B1, Tab 2, Appendix, page 14

Please provide details of all storage-related AROs in the Test Year, including the type and amount of each, and an evidence reference showing how those AROs are allocated between regulated and unregulated storage operations.

---

**Response:**

The Asset Retirement Obligation included in the Test Year is $127.530 million which is made up of the following:

| Line No. | Asset Retirement Obligation | ($000's) |
|---|---|---|
| 1 | Legal | 123,236 |
| 2 | Asbestos | 649 |
| 3 | Storage Wells | 3,595 |
| 4 | Other | 50 |
| 5 | Total ARO | 127,530 |

Legal includes Transmission Mains and Distribution Mains and Services. The ARO related to storage is $3,595,000 and relates to the obligation to safely abandon storage wells at the end of their useful lives. Union's methodology is that Storage ARO's are allocated between regulated and unregulated operations based on the allocation of the underlying asset. For example, wells are allocated 37.66% to unregulated operations. Since the annual accretion on the Storage Well ARO is not material, Union has not yet allocated any storage ARO's to the unregulated operation.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Ref: B1, T2, Page 7

Union apparently spent $13.1 million in capital on unregulated storage projects. Please explain how the financing and ownership costs of these projects are kept separate from the regulated utility accounts, with respect to rate base, depreciation, interest during construction, insurance, and the like, and how are the physical assets themselves distinguished.

---

**Response:**

The $13.1 million of capital expenditures identified is for maintenance capital projects that do not result in an increase in capacity or deliverability. The allocation between regulated and unregulated is in the same proportion as the original allocation of the base assets. Costs are allocated between regulated and unregulated for all cost types, including interest during construction. A separate asset structure has been set up to record and track the assets that have been allocated to the unregulated operation. The unregulated asset structure rolls up to a unique general ledger account and depreciation expense calculated on unregulated assets posts to a unique depreciation expense account. There is no identifying characteristic on the physical assets to identify them as either Transmission, Storage & Transmission Shared, Storage Only or Unregulated Storage.

For a more comprehensive description of the cost allocation methodology, please see Union's 2010 Earnings Sharing & Disposition of Deferral Accounts and Other Balances (EB-2011-0038), Exhibit A, Tab 4, Attachment 1.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit A2, Tab 3, Schedule 1, Appendix C

Please provide the immediately prior version of this "Revised" document.

---

**Response:**

Please see Attachment 1, for the immediately prior version of the document in Exhibit A2, Tab3, Schedule 1, Appendix C.

# 2012 and 2013 Capital Budget Instructions

February 2011

# Budget Assumptions

- Interest During Construction (IDC) – 4.29% (2012 and 2013)
- USD Exchange – 1.00 USD = 1.019 CAD
- Salary & Wage Increase – **(To be provided)**
- Leakage & DREAM Model – available on the Union Gas Portal site
- SAP version 50 (both years)
- Link to 2012 and 2013 Instructions and Documentation *(including: Instructions, WBS Elements, Component Listings; IFRS – Capital vs. O & M, SE Budget Categories):* *2012 and 2013 Instructions & Documentation*
- Inflation – 2.1% for everything other than those listed in the "Inflation Indices

# Inflation Indices

| | 2012 |
|---|---|
| Steel Pipe | 2.0% |
| Plastic Pipe | 2.0% |
| Fittings | 2.0% |
| Meter & Regulators | 2.0% |
| Fleet Cost | 2.1% |
| General Travel | 2.1% |
| Contract Labour | 3.2% |
| Tools | 2.0% |
| Furniture | 2.0% |

| | 2013 |
|---|---|
| Steel Pipe | 1.8% |
| Plastic Pipe | 1.8% |
| Fittings | 1.8% |
| Meter & Regulators | 1.8% |
| Fleet Cost | 2.1% |
| General Travel | 2.1% |
| Contract Labour | 4.0% |
| Tools | 1.8% |
| Furniture | 1.8% |

# Consumer/Service Forecasts

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## 2012 Customer/Service Forecast

| | Consumers | Services |
|---|---|---|
| Windsor | 1,036 | 806 |
| Chatham | 291 | 198 |
| Sarnia | 381 | 326 |
| London | 2,840 | 2,582 |
| Brantford | 934 | 785 |
| Waterloo | 3,843 | 3,355 |
| Hamilton | 2,656 | 1,989 |
| Halton | 3,513 | 3,302 |
| Kingston | 2,356 | 2,160 |
| NW Thunder Bay | 430 | 386 |
| NW Timmins | 175 | 118 |
| NE Sudbury/SSM | 1,030 | 923 |
| NE Muskoka | 895 | 802 |
| **Total** | **20,380** | **17,732** |

## 2013 Customer/Service Forecast

| 2013 | Consumers | Services |
|---|---|---|
| Windsor | 1,163 | 904 |
| Chatham | 323 | 220 |
| Sarnia | 420 | 359 |
| London | 3,138 | 2,852 |
| Brantford | 1,027 | 864 |
| Waterloo | 4,274 | 3,731 |
| Hamilton | 2,975 | 2,228 |
| Halton | 3,955 | 3,718 |
| Kingston | 2,606 | 2,390 |
| NW Thunder Bay | 455 | 408 |
| NW Timmins | 180 | 122 |
| NE Sudbury/SSM | 1,032 | 927 |
| NE Muskoka | 943 | 848 |
| **Total** | **22,491** | **19,571** |

# CAPITAL PROJECT GUIDELINES

- **Capital Budget Template Instructions:**
- The capital budget requires detailing by the following categories in order to apply the proper loadings to the projects. **DO NOT ADD LOADINGS TO YOUR COSTS.**
  - Salary/Wages
  - Material
  - Other
- Capital Budget Upload Templates will be posted on Sharepoint.
- See the template instructions within the template for complete details on how to populate the template.
- **NOTE:** IDC and loadings will be calculated within SAP on budgeted dollars. The loadings are currently being reviewed and may differ from the percentages on the template used in the 2010 Budget. You will need to reconcile your Plan with SAP once the loadings have been applied.

# Guidelines - continued

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**All Projects**

- **Templates –** When projects are created in SAP – templates reside in **11** (formerly 99 or 00) and must be used. (e.g. – 01-**11**-DAU, 22-**11**-DAO, 33-**11-**DAD) The correct loadings to be applied to the projects are within the new templates.
- **NEW BUDGET CATEGORIES –** will be available in SAP (drop down selection). You will be required to select the appropriate category when creating your project in SAP. Details to follow once available.
- Capital Projects that are being carried forward from one year to the next should use the same project number as past years even though it is identified with a project year other than 12 or 13.
- **Abandonment Costs** (costs of removing old plant) & Salvage Costs (amount received from the sale of the old plant) need to be planned in the 9000 WBS element series.
- **Reinstated:** WBS elements for groundbeds and rectifiers.

# Guidelines - continued

- **Schedule 3's will not be required for routing purposes.** They should be prepared and kept locally and require the Project Submitter and the Project Sponsor to sign off on them. The Schedule 3's will need to be uploaded to the Sharepoint site as follows:
  - **Risked Based Projects – April 8th**
  - **All other projects – April 30th**
- The Schedule 3's need to be uploaded into the proper SE Budget Category Folders (e.g. Contractual, Economic Justification, In Franchise Growth, etc) **Please indicate the Budget Category on the Schedule 3**. Links to Sharepoint site for uploading Schedule 3's:
  - 2012 SE Budget Categories
  - 2013 SE Budget Categories

- **Project Submitter** – responsible for the physical construction of facilities or purchase of assets and management of funds allocated for the project.
- **Project Sponsor** (similar to Project Approver for requisitions) – responsible for the overall success of the project and refers to the head of the department that will be the most obvious beneficiary of the project.

# Guidelines - continued

- **Cashflow** the project when you expect the actual **costs to be incurred**. Use an appropriate method to arrive at the cashflow per month by considering:
  - Historical spending – can be used as a reference but remember you have different projects each year with different cashflow requirements;
  - Avoid dividing by 12 months;
  - Review the entire portfolio of work – can it all be done in the timing?

# Guidelines - continued

- **Interest During Construction (IDC)** will need to be considered (IN SAP run ZPPMR029 – Allowance for funds used during construction plan). **Attach the IDC report (from SAP) to the Schedule 3.** The following rules apply for considering IDC:
  - *Construction & Software Projects* meeting the following criteria:
    - *Projects > $1M and*
    - *Construction period > 12 months*
    - *CWIP (construction work in progress) from previous year if the above criteria are met.*
  - *Exceptions:*
    - *Services (major & blanket)*
    - *Scattered mains*
    - *Scattered meter sets*
    - *Meter/regulator purchases*

# Guidelines - continued

- **Early Order Materials for 2012 Projects**
  - This process is to facilitate the pre-ordering of long lead time items for known projects. The intent is that materials can be ordered in the Fall of 2011 for 2012 projects.
    - Budgetary dollars do not need to be included in the 2011 capital budget for 2012 construction projects.
    - A requisition will need to be created in order to have the materials ordered; however, the cashflow should not be started until January 2012.
    - The materials must be ordered late enough in 2011 so that they **are not** delivered until January 1, 2012.

# Guidelines - continued

**New Business Mains/Services/Meter & Regulator Blankets**

- **2012 and 2013 Requirements:**
  - Budget to same level of detail as historical process.
  - Assumptions based on forecast provided by Head Office.
  - Schedule 3's – indicate the Budget Category.

**Replacement Projects (General, Municipal, Leakage, Services)**

- Specific general replacement projects **<$200k** are to be included in a Division blanket and not separately identified in SAP.
- General replacement blankets are to be budgeted in SAP Priority 7 – Replacements.
- Municipal projects/blankets are to be budgeted in SAP Priority C – Mains Municipal.
- The blanket amount will need to be supported and justified through specific projects, historical data, etc.

# Guidelines - continued

- **Replacement Projects (excluding blankets) > $200k must provide:**
  - Asset details of the plant being replaced**.** For example – a station rebuild project would require an estimated percentage of the existing facility being retired.
  - Business Case, Leakage Model (if required), CPREP cost estimates and Risk Ranking; Please indicate Risk Ranking and Budget Category on Schedule 3.
- **2012 Requirements – General, Municipal, Leakage, Services:**
  - One Schedule 3 per blanket with a list of each project planned as part of the blanket, Leakage Model for leakage projects.
  - Risk Ranking must be completed for all projects within the blanket.
- **2013 Requirements – General, Municipal, Leakage, Services;**
  - One Schedule 3 per blanket with a list of each project planned as part of the blanket.
  - High level cost estimates for blankets (based on historical costs). **No risk rankings required at this time.**
  - Projects >$200k will require Schedule 3 with business case, Leakage Model (if required), CPREP cost estimates and risk ranking.

# Guidelines - continued

- **Major Projects**
  - All projects **> $200k** are to be separately identified, supported and budgeted as such in SAP.
  - Only specific projects classified as New Business Major (>$200k) are to be budgeted in SAP Priority 4 – New Business – Major.
  - Only specific projects classified as Replacement Majors (>$200k) are to be budgeted in SAP Priority 9 – Replacement Majors.

  - **2012 Requirements:**
    - Schedule 3 required for each project > $200k including full business case, Leakage Model (if required), Dream runs (if required), CPREP cost estimates and Risk Ranking (Replacement Majors);

  - **2013 Requirements:**
    - Schedule 3 required for each project > $200k including full business case, Leakage Model (if required), Dream runs (if required), CPREP cost estimates and Risk Ranking (Replacement Majors);

# Guidelines - continued

- **Reinforcement Projects**
  - **ALL** reinforcement budget dollars are to be identified as specific projects and set up as such in SAP.
  - There is to be no division blankets for reinforcement projects.

  - **2012 Requirements:**
    - Schedule 3 required for each project (regardless of cost) including Business Case, CPREP cost estimates and Risk Ranking.
  - **2013 Requirements:**
    - Schedule 3 required for each project (regardless of cost) including Business Case, cost estimates at a higher level. (e.g. Based on historic trends)
    - **No Risk Ranking required at this time**.

# Guidelines - continued

**Risk Based Category –** includes projects that improve, upgrade or replace operating infrastructure and are subject to ranking based upon OMS risk analysis.

- Projects in this category include:
  - Leakage replacements
  - General Replacements and Major Replacement projects
  - Station Replacements
  - STO projects based on condition ie. RTU upgrades, turbine overhauls, lube oil systems etc.
- Risk Ranking (consequence driver and corresponding likelihood) must be identified on your Schedule 3.
  - One comprehensive financial schedule 3 may be completed for a blanket but each known project requires a separate project justification (Sch 3c) with risk ranking justification and leakage model if required.
- **Risk rank review meetings will take place between April 8th and 30th** . Any risk rank changes will be communicated with originator by April 30th. Review teams are as follows:
  - Distribution Station projects– Jeff Falkiner, Kevin Bowers, Charlie Higgins
  - Distribution Pipeline projects – Scott Walker, Kevin Bowers, Charlie Higgins
  - STO projects – Jeff Falkiner, Jim Harradine, Bob Wellington
- A follow up call will be scheduled to allow more discussion regarding risk ranking
- Please contact Denise Spadotto or risk rank review team members with any questions.

# Capital budget categories

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| Budget Category | Description | Union Gas Examples |
|---|---|---|
| Regulatory / Code Compliance | Projects required to meet prescriptive regulatory requirements and all projects that Spectra has committed to a regulatory agency to complete under Goal Oriented / Performance Based regulations. | • Integrity<br>• Certificate of Approval<br>• Meter & regulator (replacements)<br>• Odourant upgrades |
| Contractual | Projects that are required due to a binding non-revenue generating contract. Sample projects include Joint Venture Agreements, Long Wall Mining (US) and Municipal Replacements (Union). | • Municipal |
| Support Operations | Projects required to improve, upgrade or replace non-operating infrastructure (i.e. nothing directly attached to gas processing, gas compressors or the pipeline). These projects typically would not survive the risk ranking process, but are extremely important to the success of the business unit. Individual projects typically cost less than $50,000 but can exceed this with management approval. | • Tools<br>• Roof/building upgrades & replacements<br>• Telephone system replacements |
| Risk Based | Projects that improve, upgrade or replace operating infrastructure and are subject to ranking based upon risk analysis (probability and consequence). | • Leakage replacement<br>• Replacements due to age & condition |
| Economic Justification | Projects that require an investment of Maintenance Capital dollars to either realize an O&M savings or generate incremental revenues which are not underwritten by a commercial contract. Hurdle rate requirements have not been established. | • Transportation replacements<br>• New buildings |
| In Franchise Growth | Union Gas is required to connect customers that request service. | • New Business<br>• Reinforcement |
| Overheads | Separated to meet Canadian accounting requirements. | • Overheads |
| AFUDC | Separated to meet Canadian accounting requirements. | • Does not apply to UG |
| Other | Projects that do not meet requirements for categories 1 – 8. | |

# Guidelines – (Head Office Support Groups – listed below, Engineering & STO)

## Blanket Projects for Unspecified Capital Salary/Wages

- When a department's salary/wages and employee expenses are directly attributable to capital projects but the specific project has not been identified, blanket projects can be created in order to capture the capital plan. These will be "**planning only"** projects and the actuals costs will be charged to the specific projects identified during the year. Examples of departments with these blanket projects are: Engineering, Lands, Regulatory, Storage Planning and STO.

- Please use the following Project number for these projects:

# Project Numbers

| | |
|---|---|
| • Corrosion Eng–PLAN-Labour Expansion | 37-XX-969 |
| • Corrosion Eng–PLAN-Labour Maintenance | 37-XX-964 |
| • EDE Admin Eng–PLAN–Labour Expansion | 37-XX-975 |
| • EDE Admin Eng–PLAN–Labour Maintenance | 37-XX-972 |
| • Elect/Control Eng-PLAN-Labour Expansion | 37-XX-977 |
| • Elect/Control Eng-PLAN-Labour Maintenance | 37-XX-974 |
| • Lands – PLAN – Labour Expansion | 37-XX-954 |
| • Lands – PLAN – Labour Maintenance | 37-XX-950 |
| • Major Projects Eng–PLAN–Labour Expansion | 37-XX-971 |
| • Major Projects Eng-PLAN-Labour Maintenance | 37-XX-970 |

# Project Numbers

| | |
|---|---|
| • Mapping/Drafting-PLAN-Labour Expansion | 37-XX-967 |
| • Mapping/Drafting-PLAN-Labour Maintenance | 37-XX-962 |
| • Measurement Eng-PLAN-Labour Expansion | 37-XX-968 |
| • Measurement Eng-PLAN-Labour Maintenance | 37-XX-963 |
| • Pipe/Const Eng-PLAN-Labour Expansion | 37-XX-965 |
| • Pipe/Const Eng-PLAN-Labour Maintenance | 37-XX-960 |
| • Procurement-PLAN-Labour Expansion | 37-XX-980 |
| • Regulatory-PLAN-Labour Expansion | 37-XX-956 |
| • Regulatory-PLAN-Labour Maintenance | 37-XX-952 |

# Project Numbers

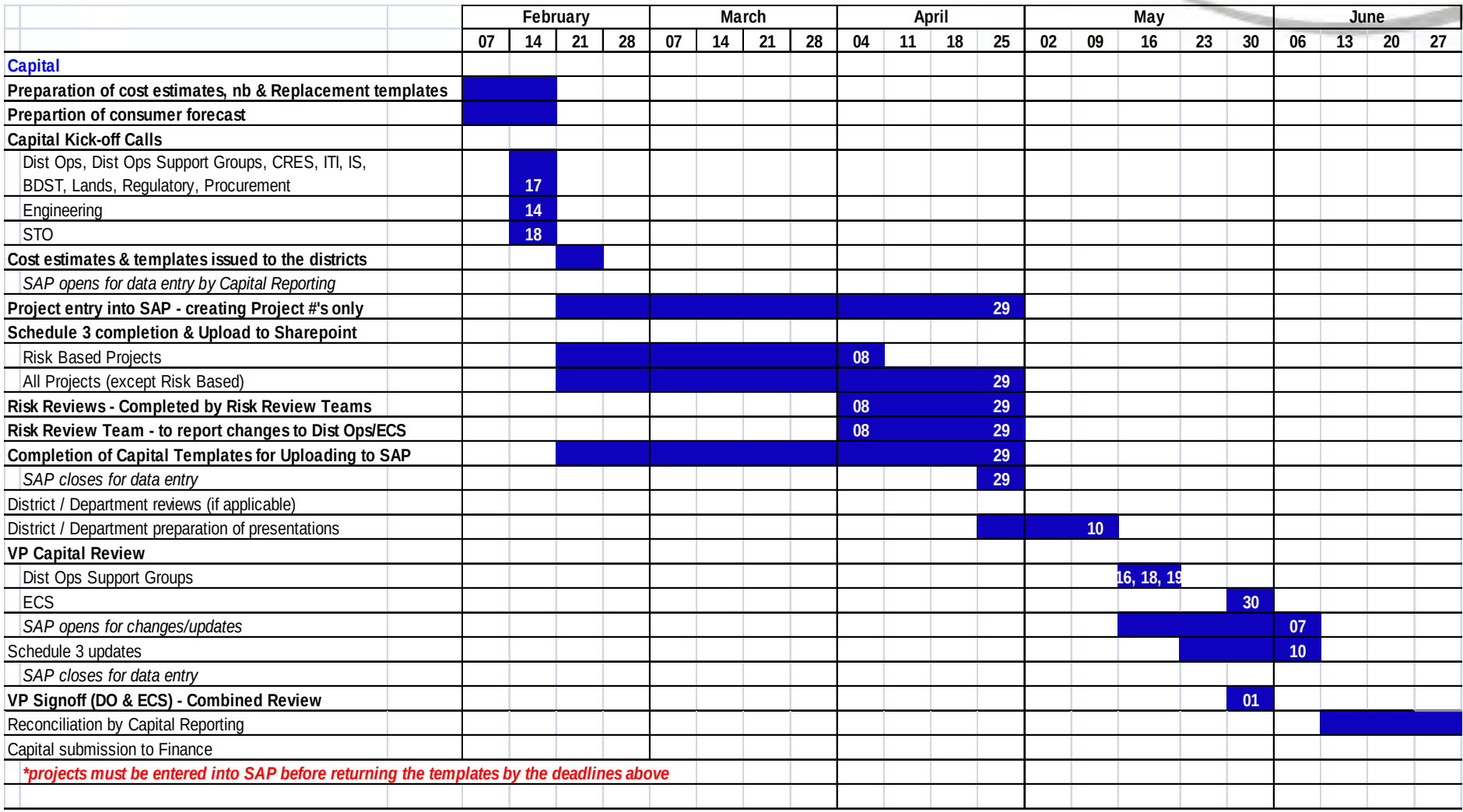
| | |
|---|---|
| • STO Eng-PLAN-Labour Expansion | 37-XX-981 |
| • STO Eng-PLAN-Labour Maintenance | 37-XX-982 |
| • Station Eng-PLAN-Labour Expansion | 37-XX-966 |
| • Station Eng-PLAN-Labour Maintenance | 37-XX-961 |
| • Stor Plang-PLAN-Labour Expansion | 37-XX-957 |
| • Stor Plang-PLAN-Labour Maintenance | 37-XX-953 |
| • System Planning Eng-PLAN-Labour Expansion | 37-XX-976 |
| • System Planning Eng-PLAN-Labour Maintenance | 37-XX-973 |
| • Welder/Fuser Eng-PLAN-Labour Expansion | 37-XX-979 |
| • Welder/Fuser Eng-PLAN-Labour Maintenance | 37-XX-978 |

# Regulated / Non-Regulated Projects

- Separate non-regulated and regulated capital expenditures. For 100% non-regulated projects, use “800” series for project numbers as well as the non-regulated WBS elements 8XXX series. If possible, reserve the “800” series for 100% non-regulated projects.
- All other storage/Dawn projects need to have both regulated and non-regulated WBS elements included in the projects. **The planned dollars need to be allocated between regulated and non-regulated.** See Chart Below:

| Facility | Regulated % | Non-Regulated % |
|---|---|---|
| Dawn Plant B | 80.14% | 19.86% |
| Dawn Plant C | 80.14% | 19.86% |
| Dawn Plant D | 80.14% | 19.86% |
| Dawn Plant E | 100.00% | |
| Dawn Plant F | 80.14% | 19.86% |
| Dawn Plant G | 80.14% | 19.86% |
| Dawn Plant H | 80.14% | 19.86% |
| Dawn Plant I | | 100% |
| Dawn Plant J | 57.55% | 42.45% |
| All Union Gas owned Storage Pools (excluding Heritage Pool) | 62.34% | 37.66% |
| Heritage Pool | | 100% |

# Timeline



| | February | | | | March | | | | April | | | | May | | | | | June | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 07 | 14 | 21 | 28 | 07 | 14 | 21 | 28 | 04 | 11 | 18 | 25 | 02 | 09 | 16 | 23 | 30 | 06 | 13 | 20 | 27 |
| **Capital** | | | | | | | | | | | | | | | | | | | | | |
| **Preparation of cost estimates, nb & Replacement templates** | | | | | | | | | | | | | | | | | | | | | |
| **Prepartion of consumer forecast** | | | | | | | | | | | | | | | | | | | | | |
| **Capital Kick-off Calls** | | | | | | | | | | | | | | | | | | | | | |
| Dist Ops, Dist Ops Support Groups, CRES, ITI, IS, BDST, Lands, Regulatory, Procurement | | 17 | | | | | | | | | | | | | | | | | | | |
| Engineering | | 14 | | | | | | | | | | | | | | | | | | | |
| STO | | 18 | | | | | | | | | | | | | | | | | | | |
| **Cost estimates & templates issued to the districts** | | | | | | | | | | | | | | | | | | | | | |
| *SAP opens for data entry by Capital Reporting* | | | | | | | | | | | | | | | | | | | | | |
| **Project entry into SAP - creating Project #'s only** | | | | | | | | | | | | 29 | | | | | | | | | |
| **Schedule 3 completion & Upload to Sharepoint** | | | | | | | | | | | | | | | | | | | | | |
| Risk Based Projects | | | | | | | | | 08 | | | | | | | | | | | | |
| All Projects (except Risk Based) | | | | | | | | | | | | 29 | | | | | | | | | |
| **Risk Reviews - Completed by Risk Review Teams** | | | | | | | | | 08 | | | 29 | | | | | | | | | |
| **Risk Review Team - to report changes to Dist Ops/ECS** | | | | | | | | | 08 | | | 29 | | | | | | | | | |
| **Completion of Capital Templates for Uploading to SAP** | | | | | | | | | | | | 29 | | | | | | | | | |
| *SAP closes for data entry* | | | | | | | | | | | | 29 | | | | | | | | | |
| District / Department reviews (if applicable) | | | | | | | | | | | | | | | | | | | | | |
| District / Department preparation of presentations | | | | | | | | | | | | | | 10 | | | | | | | |
| **VP Capital Review** | | | | | | | | | | | | | | | | | | | | | |
| Dist Ops Support Groups | | | | | | | | | | | | | | | 16, 18, 19 | | | | | | |
| ECS | | | | | | | | | | | | | | | | | 30 | | | | |
| *SAP opens for changes/updates* | | | | | | | | | | | | | | | | | | 07 | | | |
| Schedule 3 updates | | | | | | | | | | | | | | | | | | 10 | | | |
| *SAP closes for data entry* | | | | | | | | | | | | | | | | | | | | | |
| **VP Signoff (DO & ECS) - Combined Review** | | | | | | | | | | | | | | | | | 01 | | | | |
| Reconciliation by Capital Reporting | | | | | | | | | | | | | | | | | | | | | |
| Capital submission to Finance | | | | | | | | | | | | | | | | | | | | | |
| ***projects must be entered into SAP before returning the templates by the deadlines above** | | | | | | | | | | | | | | | | | | | | | |


# strive higher

FOR THE ENERGY IN YOU

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit A2, Tab 3, Schedule 1, Appendix C, page 17

Please explain in detail the "risk ranking" process.

---

**Response:**

Please see the response at Exhibit J.B-4-1-3d).

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit A2, Tab 3, Schedule 1, Appendix A, page 18

Please identify in the Application all "projects that require an investment of Maintenance Capital dollars to…realize an O&M savings". For any of those projects that have business cases showing the economic justification, please identify them in the evidence or provide them in the response to this question. For any that do not have business cases, please provide whatever economic justification document the Applicant relied on in approving the project.

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**Response:**

Projects that require an investment of maintenance capital dollars to realize an O&M savings are Transportation Replacements and New Buildings. Please see the response at Exhibit J.B-4-1-3 and Exhibit J.B-1-5-13 respectively for the economic justification of these projects.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Ref: Exhibit B1, Tab 4, page 7

Please provide a copy of the CB Richard Ellis report.

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**Response:**

Please see the response at Exhibit J.B-1-5-13.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-Housing Providers of Ontario ("FRPO")

Ref: Exhibit B3, Tab 2

Please provide Continuity of Property, Plant and Equipment and Continuity of Accumulated Depreciation tables for Total Plant and Unregulated Plant for 2011, 2012, & 2013.

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**Response:**

Please see the response at Exhibit J.G-1-8-1 a).

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-Housing Providers of Ontario ("FRPO")

Ref: Exhibit B1, Summary Schedule 2

For each hybrid utility/non-utility project (e.g. lines 1, 3, 4, 10, 11, 12, 13, 14, 15, 19, 20, 21) and General and Other project (e.g. lines 142-174) please describe, in detail, how the total project cost is allocated between utility and non-utility ("unregulated"), including any allocations of utility costs between storage and transmission.

---

**Response:**

Project expenditures have been allocated between regulated and unregulated based upon the asset that is being constructed (or is expected to be constructed in the case of the forecast). Union allocates these assets based upon the Board-approved 2007 cost study methodology. The methodology was approved by the Board in EB-2011-0038.

| Description | Allocation to Unregulated | Comment |
|---|---|---|
| New Storage asset | 100% | Based on the NGEIR decision (EB-2005-0551) any new storage assets that increase capacity or deliverability, constructed after the decision will be assigned to unregulated. |
| Replacement Storage asset or new storage assets that do not increase capacity or deliverability. | 37.7% | Based on cost allocation methodology approved by the Board in EB-2011-0038. |
| Replacement Storage Asset plus improved operational efficiencies and /or growth opportunities | Replacement is allocated base on the historical (allocation) and cost of incremental capacity is allocated 100% to unregulated. | Allocated the portion of costs associated with the increased efficiency and/or growth of that storage operation to the unregulated storage operation. |

| | | |
|---|---|---|
| Replacement of Storage & Transmission Assets – compression | 19.9% | Based on cost allocation methodology approved by the Board in EB-2011-0038. |
| Replacement of Storage & Transmission Assets – Measuring & Regulating | 9.9% | Based on cost allocation methodology approved by the Board in EB-2011-0038. |
| Replacement of Storage Assets – Dehydration | 22.2% | Based on cost allocation methodology approved by the Board in EB-2011-0038. |
| General Assets | 2.9% | All general plant (other than vehicles and heavy equipment) based on the cost allocation methodology that was approved by the Board in EB-2011-0038. |

The asset allocation described above applies to the projects identified in Attachment 1.

| Line No. | Function | Regulated Actual 2007 | Total Actual 2007 | Regulated Actual 2010 | Total Actual 2010 | Regulated Actual 2011 | Total Actual 2011 | Regulated Forecast 2012 | Total Forecast 2012 | Regulated Forecast 2013 | Total Forecast 2013 | In Service Date | Unregulated Allocation Factor | Cost Allocation Desciption | Justification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Storage** | | | | | | | | | | | | | | |
| 1 | Dawn Plant F Compressor | 1,744 | 2,176 | | | | | | | | | December 29, 2006 | 19.9% | New storage and transmission compression assets. | This project forms part of the Dawn-Trafalgar Facilities Expansion Program (2006 - 2007 winter), which allows for the incremental expansion of system capacity by adding pipeline sections and compression capability, as required, to meet growth in market demand. |
| 3 | Dawn Plant J | | | 5,757 | 10,004 | 15,426 | 26,805 | 1,169 | 2,031 | | | September 30, 2011 | 42.5% | Replaced Dawn Plant A (Storage and Transmission asset) plus provided incremental capacity which is 100% unregulated. | The Dawn A plant reciprocating compressors, ranging from 35 to 50 years old exceed the legislated Provincial Air emissions standards. The existing A plant has to be replaced in order to comply with the legislation. |
| 4 | STO Dehy Incinerator Installations | | | 766 | 1,228 | | | | | | | November 3, 2010 | 37.7% | Dehydration Incinerator located at storage pools therefore replacement storage asset. | As part of the Comprehensive Certificate of Approval with MOE, benzene emissions from storage pool dehydrators were identified as unacceptable. MOE mandated that incinerators be installed on all 5 storage pool hydrators before the next operating season after 2008/2009. |
| 10 | 27,600 Volt Dead Buss Closure | | | | | 655 | 819 | | | | | November 1, 2011 | 37.7% | Replacement of storage asset. | In the event of a utility (Hydro One) power failure all the individual plant generators at Dawn will start to feed emergency power to their specific areas of the Dawn Plant. If any one of these generators fail during operation and Hydro One power is still not available, that entire section of the facility will have NO POWER to support the associated plants continued operation. We need to have the ability to generate our own power from the 600 Volt system back up to our 27,600 Volt company owned network to allow an alternate power source to the failed area of the plant. |
| 11 | Dawn B Gas Generator Miidlife | | | | | 1,170 | 1,462 | | | | | October 1, 2011 | 19.9% | New storage and transmission compression assets. | The Dawn B RB211 is due for a midlife overhaul in order to maintain unit reliability. Overhauls must occur when the unit has operated for 25,000 hours, but recent repairs have extended the limit to 30,000 hours. The unit currently has operated in excess of 30,700 hours. |
| 12 | Dawn Fire Hydrant System Upgrade | | | | | 626 | 783 | 400 | 500 | 200 | 250 | August 31, 2013 | 19.9% | New storage and transmission compression assets. | The south yard fire hydrant system is antiquated, unreliable, does not have enough water capacity and the coverage is also inadequate. Recently the JHSC condemned the south yard fire pump because it failed to start the last 3 attempts and parts are not available for the 1943 Continental engine. |
| 13 | ECS Mandaumin Pool Modifications | | | | | | | 408 | 680 | | | November 1, 2012 | 37.7% | New storage with no incremental capacity | This project consists of construction of a separator, tank, and choker valves at wells 4, 6, and 7. These facilities will increase operational efficiency of the Mandaumin pool, allowing improved injection and withdrawal capacity. |
| 14 | STO Hagar Exhaust Stack Replacements | | | | | | | 800 | 800 | | | Summer 2012 | 0.0% | Regulated storage asset - not located at Dawn facility. | The purpose of this project is to reduce the KVGR exhaust noise by 25 dBA, and reduce the JVG, Turbine #1 and #2 exhaust noise by 15 dBA. This work has been identified in our Comprehensive Certificate of Approval and needs to be completed in order to comply with the CC of A. |
| 15 | STO Hagar Tank Painting | | | | | | | 500 | 500 | | | June 1, 2012 | 0.0% | Regulated storage asset - not located at Dawn facility. | The scope of the project is to repaint the entire LNG Storage Tank. It is currently degraded and outer tank metal is exposed to harsh elements of Northern Ontario weather. The paint is peeled on various sections exposing primer last barrier of protection. |
| 19 | Emergency Shut Down Valve | | | | | | | | | 320 | 534 | November 1, 2013 | 37.7% | New storage with no incremental capacity | This project will install Emergency Shutdown Valves (ESV) on all injection/withdrawal wells. The initial phase of this project targets pools that contain wells with the highest risk consequence ratings. High consequence wells were selected based upon: proximity to the nearest residence, distance from Dawn and maximum well flow. |
| 20 | CS - Sewage Lagoon Upgrade | | | | | 805 | 1,005 | | | | | December 15, 2011 | 19.9% | Asset that supports both the storage and transmission assets. | Recently the need for additional upgrades has become necessary due to age of the system and the fact that over the years of use, capacity has diminished. The need to add additional treatment to the wastewater effluent has also become necessary following the recommendations of the licensed Lagoon operator and the engineering companies Union Gas has hired to study the Lagoon operation. Now there is a requirement to make upgrades to the Lagoon to meet the wastewater guidelines as set out by the Ministry of the Environment. |
| 21 | Storage Projects listed above | $ 1,744 | $ 2,176 | $ 9,993 | $ 14,702 | $ 18,682 | $ 30,874 | $ 4,449 | $ 5,964 | $ 6,440 | $ 7,157 | | N/A | Subtotal of above lines. | |

| Line No. | | Function | Regulated Actual 2007 | Total Actual 2007 | Regulated Actual 2010 | Total Actual 2010 | Regulated Actual 2011 | Total Actual 2011 | Regulated Forecast 2012 | Total Forecast 2012 | Regulated Forecast 2013 | Total Forecast 2013 | In Service Date | Unregulated Allocation Factor | Cost Allocation Desciption | Justification |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | | Storage Projects less than $500,000 | 3,926 | 5,028 | 1,938 | 3,159 | 5,123 | 5,985 | 6,965 | 8,341 | 5,122 | 6,329 | | | | |
| 23 | | | $ 5,670 | $ 7,204 | $ 11,931 | $ 17,861 | $ 23,805 | $ 36,859 | $ 11,414 | $ 14,305 | $ 11,562 | $ 13,486 | | | | |
| | | | | | | | | | | | | | | | | |
| | | **General** | | | | | | | | | | | | | | |
| 142 | | SCADA Replacement | 796 | 820 | 3,152 | 3,247 | 2,588 | 2,666 | | | | | December 22, 2011 | 2.9% | General Assets allocation rate. | This project is to replace the SCADA host system (not field equipment or telemetry infrastructure), as the hardware and software is >10 years old and obsolete. The SCADA system is used to operate the Union Gas transmission, storage and distribution systems. |
| 143 | | Customer Support Reliability | 564 | 581 | | | | | | | | | January 28, 2007 | 2.9% | General Assets allocation rate. | Ensure funding is available for Contract Resources and third party IS vendors to maintain compliance with internal and external mandates. These dollars will be utilized to hire contractors and professional services in support of Union Gas IT applications. |
| 144 | | ESPM (NGEIR) | 1,876 | 1,932 | 0 | | | | | | | | June 15, 2008 | 2.9% | General Assets allocation rate. | In response to the OEB Natural Gas Electric Interface Review ("NGEIR") process, Union Gas entered into a Settlement Agreement on June 13, 2006. As part of this Agreement, Union committed to offering new exfranchise power services. This capital project will fund the changes required to offer these new services. |
| 145 | | Cafeteria Equipment Upgrade - Safety Initiative | 111 | 114 | 0 | | | | | | | | November 20, 2008 | 2.9% | General Assets allocation rate. | Upgrade the kitchen equipment and food display units in order to offer healthier food options in a reinvented atmosphere that encourages Union Gas employees to choose the cafeteria over dining elsewhere. |
| 146 | | IT Demand Management - Bus Development/S&T | | | | | 2,719 | 2,801 | | | | | ongoing | 2.9% | General Assets allocation rate. | Uses allocate IT capital to group a dozen smaller projects into a single submission to be managed by IT Demand Management, based on emerging demands. |
| 147 | | Probability and Risk Optimization | | | 1,167 | 1,202 | 579 | 597 | | | | | February 28, 2012 | 2.9% | General Assets allocation rate. | This project reviews the historical use of assets (molecule, space, Dawn to Parkway transportation, and deliverability) to determine opportunity for increased revenues. |

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-Housing Providers of Ontario ("FRPO")

Ref: Exhibit B1 Tab 6, page 19

Please a description of the function of the Great Lakes Controller's 36" By-pass.

a) Please provide a quantification of the increased design throughput efficiency expected.

b) Does the expected throughput efficiency increase the total delivery capability of the Dawn plant?

c) If so, why does the non-utility not attract any cost for this upgrade?

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**Response:**

a) Great Lakes supply volumes vary widely throughout the winter. Please refer to the graph of Great Lake's deliveries provided in the response at Exhibit J.B-1-13-2 d). This variability is expected to continue. The Great Lake's 36" by-pass is being proposed to lower the pressure drop when flows received from Great Lakes are high. For example, when flow rates reached 48,737 103m3/d, as seen on February 18, 2011, the expected pressure drop through the control valve segment would have been reduced by 80%. This asset will provide transmission services only.

b) Due to the highly variable Great Lakes deliveries at Dawn, Union has not included an increase in total delivery capability on design day. Expected throughput efficiency is gained when Great Lakes volumes are high.

c) The non-utility business is not allocated any costs for the Great Lakes Controller by-pass as the asset provides transmission service only.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-Housing Providers of Ontario ("FRPO")

Ref: Exhibit B, Tab 2, Schedule 2

Union proposes to adjust transmission plant by negative $9,328,000 and increase underground storage plant an equal amount.

a) What portion of this is related to the reassignment of Oil Springs East costs?

b) Please explain the adjustment Union proposes to make to non-utility storage plant.

c) If Union does not propose to adjust non-utility storage plant, please explain why Union believes that no adjustment is required.

---

**Response:**

a) None.

b) No adjustment to non-utility storage plant is required.

c) Traditionally all assets within the Dawn yard have been categorized as Storage assets for accounting purposes. During cost allocation, assets whose function is to provide Transmission services are reassigned. The $9,328,00 adjustment relates to Tecumseh Measurement and Total Measurement assets that are located within the Dawn yard, but are currently classified as Transmission. An adjustment has been made in 2013 to correct the inconsistency in accounting.

   No allocation to non-utility storage is required as these are assets within the Dawn yard providing regulated transmission services.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-Housing Providers of Ontario ("FRPO")

Ref: Exhibit G3, Tab 3, Schedule 1
EB-2005-0520 Exhibit G3, Tab 3, Schedule 1

Separation of Base Pressure Gas

a) Please provide total GJ's of Base Pressure Gas and the unit price of that gas as represented by the respective Base Pressure Gas amounts for each of the two cost studies.

b) How was the separation of cost of base pressure gas effected between utility and non-utility storage (i.e., please provide the amount and unit cost of Base Pressure Gas transferred to non-utility storage).

---

**Response:**

a)

| | | 2007 Cost Study | 2013 Cost Study |
|---|---|---|---|
| Base Pressure Gas ($000s) | 1 | $48,544 | $35,204 |
| Volume ($10^3 m^3$) | 2 | 1,511,949.20 | 965,303.22 |
| Cost per ($10^3 m^3$) | 3 = 1 / 2 | $32.11 | $36.47 |
| Heat Conversion Factor | 4 | 37.75 | 37.75 |
| GJ | 5 = 2 * 4 | 57,076,082 | 36,440,197 |
| Cost per GJ | 6 = 1 / 5 | $0.85 | $0.97 |

For comparative purposes, the Heat Conversion Factor from the 2013 Cost Study was used for both the 2007 and 2013 calculation.

b) The cost of base pressure gas was allocated between regulated and unregulated using the methodology approved by the Board. As storage pools are used for storage only, the allocation to the unregulated operation was completed using the 37.66% allocation factor.

| | |
|---|---|
| Base Pressure Gas transferred to Unregulated ($000s) | $18,336 |
| Volume ($10^3$ $m^3$) | 569,400.08 |
| Cost per ($10^3$ $m^3$) | $32.20 |
| Heat Conversion Factor | 37.75 |
| GJ | 21,494,853 |
| Cost per GJ | $0.85 |