ONTARIO ENERGY BOARD

EB-2012-0451
EB-2012-0433
EB-2013-0074

IN THE MATTER OF an application by Enbridge Gas Distribution Inc. for: an order or orders granting leave to construct a natural gas pipeline and ancillary facilities in the Town of Milton, City of Markham, Town of Richmond Hill, City of Brampton, City of Toronto, City of Vaughan and the Region of Halton, the Region of Peel and the Region of York; and an order or orders approving the methodology to establish a rate for transportation services for TransCanada Pipelines Limited;

AND IN THE MATTER OF an application by Union Gas Limited for: an Order or Orders for pre-approval of recovery of the cost consequences of all facilities associated with the development of the proposed Parkway West site; an Order or Orders granting leave to construct natural gas pipelines and ancillary facilities in the Town of Milton; an Order or Orders for pre-approval of recovery of the cost consequences of all facilities associated with the development of the proposed Brantford-Kirkwall/Parkway D Compressor Station project; an Order or Orders for pre-approval of the cost consequences of two long term short haul transportation contracts; and an Order or Orders granting leave to construct natural gas pipelines and ancillary facilities in the City of Cambridge and City of Hamilton.

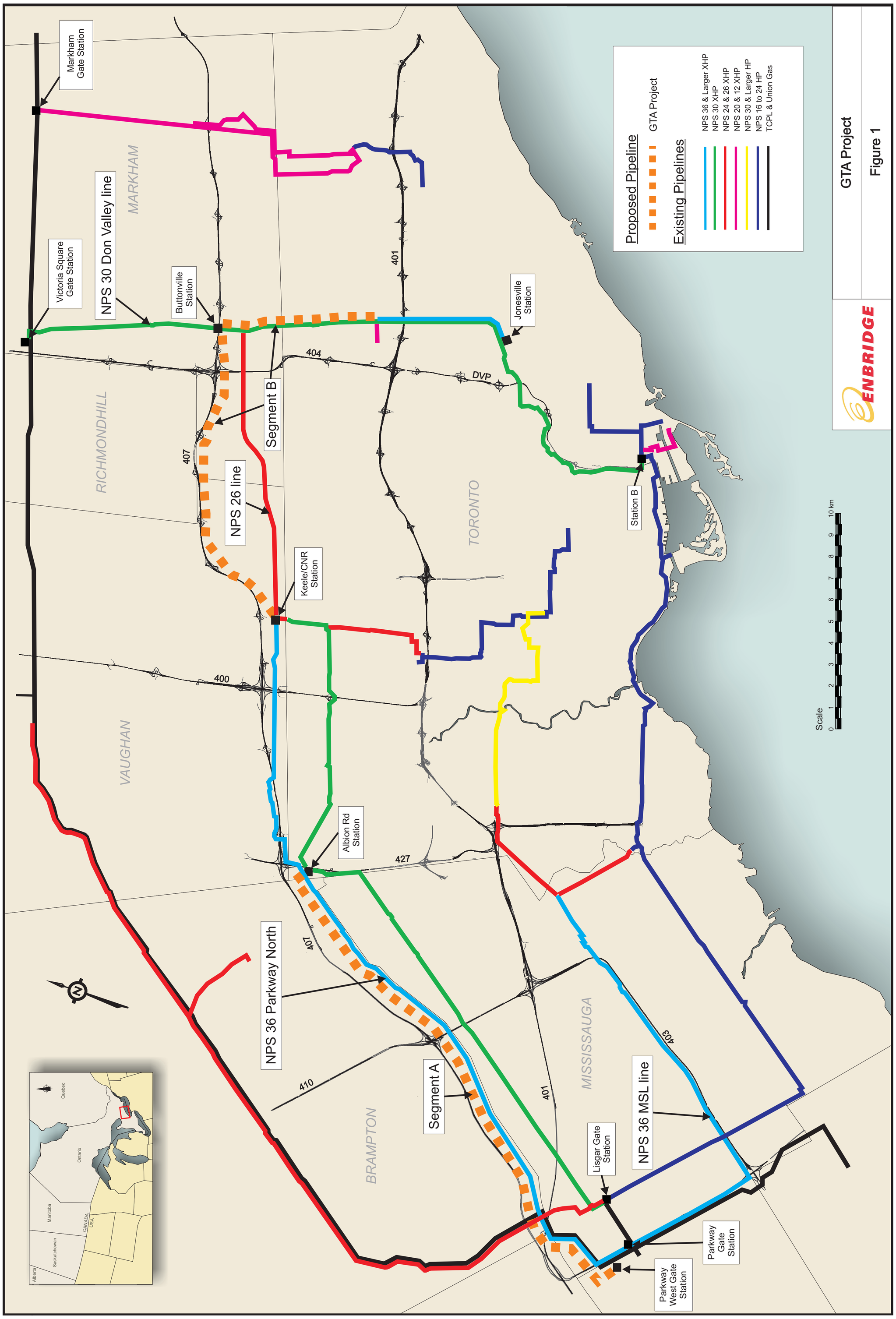
Association of Power Producers of Ontario

Cross Examination Compendium

Of

Enbridge Gas Distribution

Filed: 2012-12-21
EB-2012-0451
Exhibit A
Tab 3
Schedule 1
Attachment
Figure 1



due to the assignment and procured at a liquid hub thereby increasing security of supply.

40. Enbridge recently bid into Union's April 24, 2012 Open Season for 400,000 GJ/d of capacity from Dawn to Parkway in 2015. The awarding of this capacity is contingent on regulatory approval of the GTA Project. Enbridge also intends to bid into an upcoming TransCanada open season for capacity from Niagara Falls to Parkway for service in 2015.

41. Assuming a continuation of existing contracting practices, the Company expects it would require approximately 519 TJ/d of STFT and 158 TJ/d of peaking supplies in order to meet projected peak day demand in 2014. These peak day requirements are outlined in Table 2 above. The Company has not yet determined peak day requirements for 2015[11] and consequently is basing the benefits calculations on the expected gas supply portfolio for 2014.

42. Attachment 1 provides details and assumptions related to the calculation of the expected gas supply benefits should the GTA Project be approved. Tables A1 to A3 list toll, fuel, and commodity pricing assumptions. By replacing approximately 100,000 GJ/d of peaking supplies and 300,000 GJ/d of STFT to the Enbridge CDA with supplies sourced from Dawn and Niagara the Company expects to generate gas supply savings of approximately $410 million over the 2015 to 2025 timeframe for system gas customers. Table A4 provides details for this calculation. A shift in DP delivery point obligations can be expected to generate benefits as well. 200,000 GJ/d of DP deliveries at Dawn rather than the Enbridge CDA[12] could generate savings of approximately $101 million over the 2015 to 2025 timeframe for DP customers. Table A4 provides details for this calculation as well. Overall the

[11] Peak day requirements for 2015 will be provided when the Company applies for 2015 rates.
[12] Deliveries to the Enbridge CDA are assumed to be procured at Dawn.

(iii) Other large industrial customs can vary but are generally 70 to 700 kPa (10 to 100 psi)

(iv) Delivery pressures to commercial and industrial customers can vary depending on their operation but are generally 14 to 700 kPa (2 to 100 psi)

(v) Residential customers have a 2 psi or lower delivery pressure, generally 1.74kPa (7 inches water column)

e) Typical minimum system pressures on Enbridge System are noted below:

Pressure Category	Minimum System Pressure
Intermediate Pressure	70 kPa (10psi)
High Pressure	410 kPa (60 psi)
Extra High Pressure	690 kPa (100psi)

Minimum system pressures, throughout the distribution system, are governed by either the minimum inlet pressure required to maintain the required outlet pressure of the district station or by a minimum delivery pressure of a specific customer.

Enbridge does not track the customers that have ‘behind the meter’ pressure enhancing facilities nor do 'behind the meter' pressure enhancing facilities have impacts on the distribution system requirements.

f) See response to BOMA Interrogatory #25 (d), part (ii) at Exhibit I.A1.EGD.BOMA.25 for operating system description.

g) Please refer to APPrO Interrogatory 10 at Exhibit I.A4.APPrO.10.

h) No question asked

i) As noted in EB-2006-0305, the looping of the Don Valley line from Sheppard Avenue to Jonesville station in 2008 was to replace the capacity on the XHP system that was attributed to PEC. As referenced in Exhibit A, Tab 3, Schedule 1 Table 2, the GTA system requires additional facilities from Sheppard Avenue to the proposed Buttonville station.

The reduction in pressure on the Don Valley line from 450psi to 375psi will result in a decrease in capacity at Station B of 165 TJ. In order to accommodate the future system growth and the pressure reduction on the Don Valley line, the proposed facilities are required.

j) Please see response to BOMA Interrogatory #15 at Exhibit I.A1.BOMA.EGD.15(a).

ENBRIDGE GAS DISTRIBUTION INC. RESPONSE TO
ASSOCIATION OF POWER PRODUCERS OF ONTARIO INTERROGATORY #1

INTERROGATORY

Reference: EB-2012-0451 Exhibit A Tab 3 Schedule 1 Purpose Need & Timing

Preamble: Enbridge has indicated that while the GTA Reinforcement Project helps to meet multiple needs, the primary benefits are to manage operational risks and meet the 10 year system growth requirements. This is a significant capital program affecting all rate classes and APPrO would like to better understand the need for these facilities, and would first like to explore the operational risks of the system and how this reinforcement alleviates such risk. Paragraph 10 indicates that the reserve or unutilized capacity is used to accommodate necessary pressure and/or flow reductions required to mitigate downstream vulnerabilities, manage day to day maintenance, integrity programs, unplanned events, and balance system flows.

a) Please explain what is meant by 'downstream vulnerability'.
b) Please explain how using reserve capacity is used to balance system flows and if the primary system capacity is also able to provide such balancing?
c) Please explain how Enbridge is accomplishing these tasks today without the proposed reserve capacity.
d) In terms of system maintenance, it is understood that Enbridge has developed a comprehensive asset management plan with a related work and asset management system. Some of the benefits of these comprehensive systems ought to be to use these extensive management systems to identify potential problems and take corrective action on a planned basis in advance of an emergency situation. Further they ought to be able to be used to also schedule maintenance during times other than times when the design day flow is expected to occur? If so, does this not reduce the need for reserve capacity over time rather than increase such need?
e) Please express the current average daily flow observed by Enbridge during the period April-November on their GTA XHP system as a percentage of the aggregate GTA XHP system design flow on the design day of the year.
f) Does Enbridge have an OEB approved design policy to determine how much reserve capacity should be included in pipeline designs? If so, please

provide.

g) Is there an industry standard on the inclusion of reserve capacity in pipeline designs? If so please provide.

h) In the event that there is no Board approved, or industry design standard used to determine the amount of excess capacity, please explain in detail how Enbridge arrived at the targeted capacity that is included in the GTA reinforcement design that will act as reserve capacity.

i) How much total reserve capacity has been provided for in the GTA Reinforcement design?

j) How much is the annual owning and operating cost of providing this reserve capacity that is being proposed?

k) Enbridge appears to be changing the entry point of 400,000 GJ/d of supply currently entering the distribution system at Victoria Square to Parkway. Will the facilities that are no longer used to transport gas from Victoria Square be considered as reserve capacity?

l) Please provide a description of the major incidents that have occurred over the last 5 years where Enbridge was not able to accommodate the 'downstream vulnerabilities, or other maintenance activities with the reserve capacity in the system that existed at the time. Please detail any incremental costs that may have been incurred in managing such incidents.

m) In the event that the Board were to approve the proposed facilities including the reserve capacity requested, please indicate the annual operations and maintenance savings that will occur from having the flexibility proposed in this expansion.

n) It is understood that both Union and TransCanada are primary suppliers of gas transportation services to Enbridge and do provide certain redundancy protection in their compressor designs to protect against mechanical equipment failure. Is Enbridge aware if either Union or TransCanada has reserve pipeline capacity included in their peak day pipeline design (i.e. not LCU compressor station design) to accommodate similar types of risks on their system as the risks raised by Enbridge?

RESPONSE

a) Downstream vulnerability refers to any situation that requires a change from normal operation. As described in Exhibit A, Tab 3 Schedule 3, Page 12 Paragraph 21 this could be but is not limited to integrity activities, maintenance activities, planned construction work, or unplanned system events, such as damages to plant.

b) Reserve capacity allows Enbridge to redirect flows on alternate supply paths and can be used to balance flows on the system to meet nomination requirements. The existing system capacity can also be utilized to perform balancing functions, but is constrained during near peak conditions, or when abnormal conditions exist on the distribution system.

c) The system is managed today as planned construction activities are conducted during non-peak time from April to October. Fortunately, major unplanned events that have occurred on the system have by chance happened during non-peak gas consumption times when demand was low enough to provide sufficient reserve capacity.

d) Enbridge generally plans maintenance activities on the system during non-peak conditions and leverages the Asset Plan to identify and prioritize these activities. However, as Exhibit A, Tab 3 Schedule 3, Paragraph 26 discusses there are many situations that could result in a temporary reduction of system pressures. Should one of these events occur at a time where the system lacks sufficient reserve capacity, there could be a loss of service to firm customers.

e) The following table provides a summary of the average daily flow during the April to November time from in 2012. The forecasted peak flow is the estimated demand at design conditions in the GTA influence area.

	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12
Daily flow to GTA Influence Area (TJ)	669	350	290	318	311	336	535	867
Forecasted peak (TJ)	2388	2388	2388	2388	2388	2388	2388	2388
Daily as percentage of peak	28%	15%	12%	13%	13%	14%	22%	36%

f) There is no OEB approved design policy that relates to reserve capacity.

g) There is no industry standard on reserve capacity. However, the distribution system must have the ability to redirect flows during an abnormal operating condition. Exhibit A, Tab 3, Schedule 3, Attachment 4, Section 7, Pages 31 and 32 discuss the findings of an independent review of the GTA system.

h) An Enbridge distribution system design consideration is the ability to lower the operating pressure of any single pipeline that is operating above 30% SMYS to less than 30% SMYS at a design day condition.

i) The approximate reserve capacity specifically at Station B is 160TJ/day in 2015 and reduces to 130TJ/day by 2025. This is the capacity on the distribution network at Station B and assumes that the gas contracts are available from upstream supplies. This is a function of both increased pipe facilities and also network synergies created by removal of network constraints.

j) The reserve capacity created is a result of meeting the project objectives and cannot be isolated from the total project costs.

k) Once pressures are reduced on the Don Valley line, there will be available capacity on the facilities that transport gas from Victoria Square.

l) Incidents or activities relating to the existing reserve capacity.

- In 2008, a leaking fitting required the isolation of the NPS 30 main in November. A maintenance force majeure was called and PEC was taken off the system. Additional costs were a refund of the demand charges to PEC.

- In 2008, a section of the Don Valley line was relocated. Given that this is the only main that can supply the required contract delivery pressures, bypasses were required at each location the new pipe was tied into the existing system. The additional cost was on the order of several hundred

thousand dollars. With the facilities proposed, the existing main would have been sectionalized and depressurized.

- A fire at the Lisgar Gate station in 2009 resulted in an extended outage of this facility. This incident occurred in late summer and the extended duration of the outage meant that heating load was increasing and resulted in lower pressures in the south Etobicoke area.

m) The new facilities will increase system flexibility when completing maintenance work and repairs. For example, it is possible that the facilities might allow a repair without installing a bypass which could result in savings, although they are very difficult to quantify at this time.

n) Enbridge cannot comment on reserve capacity on the Union Gas or TransCanada mainline systems.

UNDERTAKING JT1.11

UNDERTAKING

TR 1, page 102

To provide how much growth can go through Station B in 2015

RESPONSE

To clarify, the Company understands the question to be how much of the forecasted load growth to 2025 (correction from 2050 in transcript) of approximately 190,000 GJ/d in the project area would be required to go through Station B.

By 2025, approximately 15 TJ/d of growth will have been added at Station B.

allowing Gas Control to swing supply from west to east and vice versa depending on demand and supply availability. In addition, Gas Control is also required to manage hourly demand within reasonable tolerances to contractual limits. The connectivity offered by the NPS 26 between the XHP systems at either end of the GTA allows the Company to manage hourly peaks. Pressure restrictions on this line would limit Gas Control's ability to manage its upstream portfolio within contract parameters.

26. As noted above, flexibility provides the ability to respond to changed conditions. When possible, maintenance and integrity activities are undertaken during periods of low demand, when there is greater reserve capacity. Planned maintenance activities usually extend from April to November, however, it may also be required in periods of higher demand. These activities include pressure/flow reductions for welding, tie-ins, or leak or damage repairs; to mitigate the risk of damage when construction or maintenance is executed in the immediate vicinity of the pipeline; or, to carry out integrity inspection activities. Temporary reductions can be required for an extended period of time based on results from the integrity management program or from an engineering assessment, ending only after the underlying condition identified can be safely remediated. In some instances, the duration may extend over the entire winter. In 2012, over 20 integrity inspections were performed across the Enbridge franchise. As per Company policies, governing regulations and standards, immediate indications[15] must be mitigated within one week of the discovery. However, if immediate indications cannot be mitigated within the specified timeframes, other actions may be required. For example, among the pipelines inspected this year, systemic pipeline defects were discovered in two pipelines. As a result, these two pipelines are currently reduced to 80% of the normal operating pressure until an additional assessment can be completed in 2013.

[15] Immediate indications are pipeline features discovered through integrity inspections that must be mitigated within a specific time frame. Otherwise, operating pressures may be restricted for longer periods of time.

stations with capacity greater than 300TJ/d, their capacity is distributed more evenly across multiple receipt points.

7.1. System Design Strategies

7.1.1. Distribution System Design

Natural gas utilities typically design systems to handle peak coincidental day deliverability requirements plus any additional projected growth. Planned outages such as those associated with major projects, operational maintenance activities are normally performed outside of peak delivery season.

Systems are generally designed to provide peak hour delivery using a steady state flow criteria based on a historical low temperature. The actual delivery characteristics for a typical utility are bimodal, with a peak occurring in the morning hours and again in the early evening. The peak hour average is approximated 20% greater than the average hourly flow. Inherent in the basic design is some margin of redundancy which provides limited flexibility to shift supply between points. With few supply points and a large concentration at a single point this limited flexibility is reduced further.

In addition to point capacity the intermediate pipeline system from the gate station to the customer must have sufficient pipe capacity to allow redirected supply to move across the system to the area of the outage. Generally distribution systems are designed to dual feed any area. Distribution systems characteristically operate smaller diameter lines at lower pressure, which also have lower capacity as a result of pressure losses. Concentration of supply results in the need for a larger diameter trunk line, similar to Enbridge's XHP and HP lines, to move supplies across the system.

For the metropolitan areas examined, Chicago has the highest concentration of 23% at a single gate station. In the event of an outage this could be redistributed to other large gate stations in the system. By comparison, Peoples Gas as an individual utility serving the city of Chicago within the Chicago metropolitan area has city gate capacity of approximately 2.2 times peak day demand.

With the large concentration of capacity, the existing GTA system is unable to move adequate supply to other points in order to mitigate an outage. Given the relatively small diameter of the HP and XHP lines compared to the volume of gas delivered through Parkway station, the system does not have the pipe capacity to reallocate supply across the system.

7.1.2. Pipeline Industry Response to Improve System Reliability

In light of recent events such as the outage experienced in New Mexico in 2011 or hurricane Sandy in 2012, steps which can be made to increase system flexibility and reliability are pragmatic. For example, high utilization

Filed: 2012-12-21
EB-2012-0451
Exhibit A
Tab 3
Schedule 3
Attachment
Figure 2