UNDERTAKING JT1.2

UNDERTAKING

TR 1, page 16

To confirm whether Sombra is included in category (line 106) and, if so, to indicate whether there are any methodological or realignment changes that being made with respect to inclusion of non-utility assets.

RESPONSE

There are no specific costs included in this line item associated with the Sombra Compressor Station.

In any event, if there were costs associated with the Sombra station, once Enbridge implements changes to the accounting treatment as described in the response to Undertaking JT1.1, as planned, then an appropriate share of the costs will be assigned to the non-utility storage business through the allocation of Plant and the A&G Overheads.

Witness: J. Sanders

UNDERTAKING JT1.3

UNDERTAKING

TR 1, page 18

To provide the increase in deliverability as a result of the KVT compressor pressure upgrade on a percentage basis.

RESPONSE

There will be no net increase in deliverability (or injectability in this case) resulting from the proposed pressure upgrade of the KVT compressor units. With the proposed increase in the maximum outlet pressure, approximately 240 million cubic feet per day ("mmcfd") of flow would be made available between an inlet pressure of 700 psig and an outlet pressure of 1200 psig. With the current configuration of these units, approximately 390 mmcfd of flow is available between an inlet pressure of 700 psig and an outlet pressure of 1000 psig.

The benefits of having the 240 mmcfd of flow available with this maximum outlet pressure are first, increased reliability for all operations (as originally proposed) and second, the increased injection capability at the higher pressures. The increased reliability comes from the distribution of the flow at the higher pressures over a larger number of compressors or in other words, the operations becomes less reliant on the fewer compressors currently capable of operating above 1000 psig. With the potential development of additional storage capacity achieved through the increase of the maximum operating pressures of existing pools, having more compressors capable of operating above the 1000 psig range is a benefit. This capability would be incorporated into the design of a future non-utility project with 100% of the incremental cost being assigned to the non-utility operations. The reliability benefit would be realized by utility operations at no cost.

Witness: J. Sanders

UNDERTAKING JT1.4

UNDERTAKING

TR 1, page 35

To list schedules to the Black & Veatch report that will be provided in future regulatory filings, and what previous schedules will no longer be filed.

RESPONSE

The schedules which potentially will be required to be filed in future regulatory filings will be entirely dependent on the structure and parameters of the regulatory model to be used for rate setting in each future year.

However, the schedules which the Company believes could be relevant and would be providing, at least in cost of service ratemaking applications, are as follows:

a) B&V Schedule 1
b) B&V Schedule 6 – Allocated O&M Costs by Cost Centre by Month
c) B&V Schedule 6 – Example of Monthly Worksheets for O&M Cost Allocation
d) B&V Schedule 4 (for the relevant period)

Witnesses: K. Culbert
J. Sanders

UNDERTAKING JT1.5

UNDERTAKING

TR 1, page 43

To provide breakdown of capital budget between utility and non-utility for the metering replacement in the 3-D seismic referenced in Exhibit I-B4-8.1 using the Black & Veatch Schedule 5 methodology.

RESPONSE

Metering Replacement – This project was driven by the underlying need for enhanced gas inventory management. This project was the replacement of the existing utility assets that had been in place prior to the NGEIR Decision and any subsequent development of unregulated storage. The measurement equipment is required for the continued operation of utility capacity and deliverability. There was, however, an incremental cost implication based upon the deliverability requirements of the unregulated storage operation.

Following the logic set out in the B&V Schedule 5 Capital Project Assessment process, the Meter replacement project was determined to not be a General Plant asset and its primary purpose was not to increase either storage capacity or deliverability.

1. Is this project a General Plant asset? No.
2. Is the project's primary purpose to increase storage capacity and/or deliverability? No
3. Does the project replace, recondition or bring existing asset up to a regulatory or corporate standard? Yes
4. Does the project create, or was it built, to support additional storage beyond that of the original asset? Yes
5. Allocate Costs- Charge amount required to replace original asset to the account and/or entity of the original asset and charge balance to EGD unregulated storage.

Based on the outcome that results from the Schedule 5 logic, the allocation of the cost was then determined as described in the response to Exhibit I, Issue B6, Schedule 8.11.

Witness: J. Sanders

3-D Seismic Program - This project was also driven by the underlying need for enhanced gas inventory management. This project was an enhancement of the storage reservoir assets that had been in place prior to the NGEIR Decision and any subsequent development of unregulated storage. EGD believes that the information provided by the 3-D seismic project is required for the continued responsible operation of the utility capacity and deliverability regardless of the development of incremental capacity and deliverability for the non-utility business.

1. Is this project a General Plant asset? No.
2. Is the project's primary purpose to increase storage capacity and/or deliverability? No
3. Does the project replace, recondition or bring an existing asset up to a regulatory or corporate standard? Yes
4. Does the project create, or was it built, to support additional storage beyond that of the original asset? No
5. Charge all costs to the account and/or entity of the original asset.

Based on this outcome, 100 percent of the cost of this phase of the 3-D seismic program was allocated to the utility (see Exhibit B1, Tab 2, Schedule 2, page 8 and Exhibit I, Issue B6, Schedule 8.1, page 3, Line 70.5333.10).

Should the Company, at some point in the future, want to use that data for the purpose of locating new wells, either for replacement of existing wells or to create additional storage capacity or deliverability, then the costs associated with re-interpreting the data and any other modeling work required for this purpose would be borne by the line of business that requires the well.

As an example, prior to the decision to acquire 3D seismic data for all of the EGD storage pools, the non-utility operation had the need for 3D seismic data to locate incremental injection/withdrawal wells. This work was done on the Wilkesport pool in 2008 at cost of approximately $600 thousand as part of an overall project to complete reservoir simulation at a cost of $905 thousand as shown on Exhibit I, Issue B6, Schedule 8.1, page 3, part c, Line 74.5204.07. One hundred percent of the cost of this project was allocated to the non-utility operation. In 2010, the utility operation had the need for a replacement well and used the Wilkesport 3-D data and computer simulation to locate the Wilkesport 14 H well. No cost was allocated to the utility for the use of these assets. This demonstrates the symmetrical utilization of the integrated assets and the synergies that this creates.

UNDERTAKING JT1.6

UNDERTAKING

TR 1, page 46

To confirm whether Company has a document called "Interactive Assessment Report" and corresponding spreadsheet, or to confirm that it is actually the document dated a month later.

RESPONSE

Please see the attached Interactive Assessment Report and corresponding spreadsheet.

Witness: L. Chiotti

ENBRIDGE GAS DISTRIBUTION

ASSET MANAGEMENT
INTERACTIVE ASSESSMENT
And PAS 55 COMPLIANCE
PROJECT REPORT
(DIAGNOSIS)

The Woodhouse Partnership Limited

2nd September 2005

Final Version

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Version	**Sections**	**Amendment Details**	**Date**
Final		Includes Enbridge comments from draft 1	2/9/05

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CONTENTS

1 Executive Summary

Asset Management is the label being used increasingly to describe the *co-ordination* and *alignment* of processes in combination with the use of tools and techniques designed to optimise the combination of cost, performance and risk for the management of physical assets. For Enbridge Gas Distribution, asset management is the main business of the company.

This report summarises the findings of a structured Asset Management review; an "interactive assessment" of the current position of Asset Management within Enbridge Gas Distribution (EGD). The interactive assessment is based on Publicly Available Specification 55, a specification for the optimized management of physical infrastructure assets issued by the British Standards Institution. The assessment was designed to ascertain how far towards best practice in asset management EGD had progressed, and to identify an appropriate prioritized program of actions to best position the company to address challenges leading up to the anticipated introduction of incentivised regulation in 2008.

Before we proceed with our summary we would like to put the observations into perspective. EDG is undoubtedly a historically successful regulated business. Furthermore it achieved this performance without compromising its excellent and enviable safety record or losing the loyalty and commitment of its workforce. To EDG's great credit it has recruited and retained a loyal and dedicated workforce. The level of enthusiasm and thirst for knowledge is one of EDG's success stories. We have commented on the potential risks associated with potential burnout of that enthusiasm elsewhere in the report. If EGD can maintain that level of responsiveness to change amongst its workforce and successfully prioritise initiatives, then its people will be a key enabler to its successful implementation of an Asset Management approach. However, our task is to identify opportunities for further improvement and ensure the sustainability of this performance within a changing regulatory regime.

It is clear from the Interactive Assessment that EGD has pockets of excellence within its various departments. Some synergy exists between departments in terms of supporting initiatives but each department has very different AM processes. This lack of aligned AM processes and structured cross functional teamworking means that we will need to produce a route map for best Asset Management practice, that takes these factors into account.

EGD is currently in the process of embedding an ambitious program of changes to its asset information systems, EnVision. This has inevitably coloured the findings of the assessment and it is recognised that the client has a number of improvement activities currently underway to address known problems emerging during the rollout. Nevertheless it was considered that to exclude EnVision would not give a realistic or useful assessment. This report therefore includes some commentary on issues associated with EnVision, but has concentrated on the processes that use the information and how they support asset related decisions.

In agreement with the sponsors, we have confined the bulk of our report to the "physical box" of Asset Management with some consideration of the interaction with business and strategic aspects where they will impact on the Physical Asset Management processes. Programs and processes within the red dashed line below are within the scope of the review (see figure 1 below)

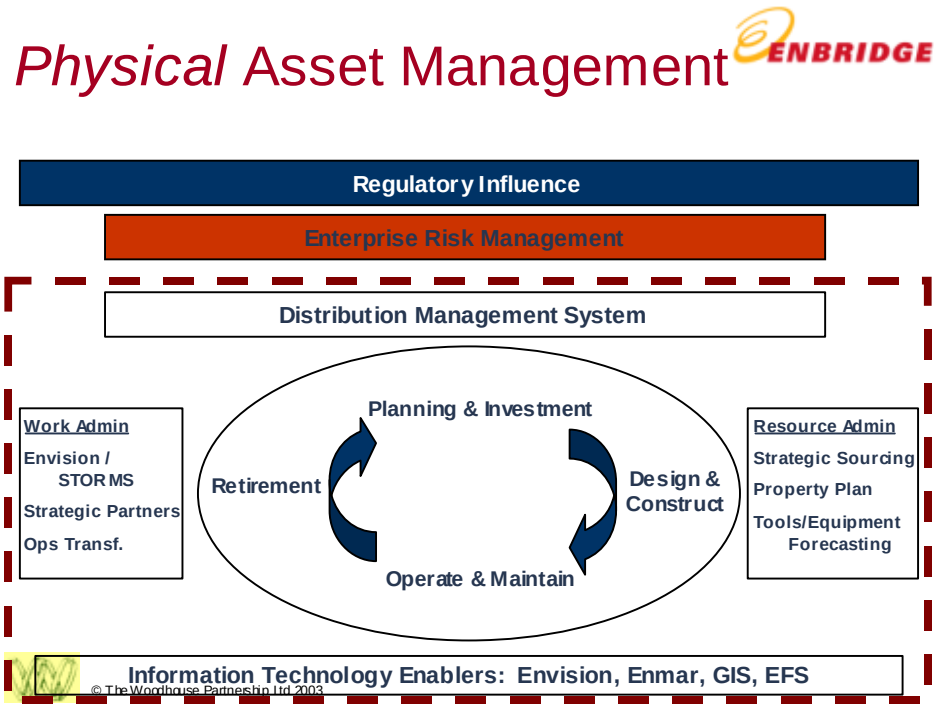


Figure 1

Overall comments:

- **The company is not yet fully compliant with the PAS 55** standard though it has a significant number of areas that are at *awareness* level and some areas that are close to *excellence*. (see section 8 for full details of PAS55 compliance scores)

- The Interactive assessment, although restricted to the "physical box", showed areas where EGD was **displaying good practice and in some cases best practice against the PAS55** specification. The assessment also identified areas where substantial improvement and change were necessary to meet AM best practice.

- EGD has a **culture of corporate responsibility, safety and high professional integrity**. There are many specific examples of good practice, and the company has sought out ways to improve and become more effective - particularly by reducing operational costs.

- The introduction of KPIs across the business has generally been a success story, but there are areas where these are not working so well. They are generally weaker on the asset performance side – with the notable exception of

the Public Safety and Reliability Index which is an example of best practice. Nevertheless there are several actions needed to prevent the development of functional 'silos' and **conflicting objectives**. These arise where departments seek to maximise their own KPIs where in fact an overall company view is needed. An example would be where individual managers prioritise their expenditure independently rather than using a common criticality framework.

- **There are too many initiatives currently underway**. The burden for delivery of these initiatives appears to be falling on the shoulders of a specific group of willing and capable people. The use of this small experienced group of individuals is impacting on the capability of the organisation to deliver the 'day job'. This is resulting in many individuals being overloaded and more worrying, putting some of them into a stressful situation at work that they recognise and can articulate. (See sections 6 and 7). The mindset is that every initiative is a priority. There is opportunity to rationalise and co-ordinate initiatives; **the introduction of a senior accountable project board would assist in delivery**.

- The business planning process is not well integrated with the business. In particular there are opportunities to **improve the capital planning processes** and use asset and financial information consistently to build a long-term prioritised plan. At present the consensus is that EGD is generally reactive rather than proactive. **There is opportunity to move expenditure between operational and capital budgets.**

- It is clear that all departments have a number of specific plans. They each have plans for achieving budgets and achieving balanced scorecard targets. These **plans are not aligned directly to the strategic plan**. The strategic plan is aspirational and it needs to be transformed into the main source of direction that feeds into the Asset Management Plan. There is little evidence of co-ordination between departments on the management of physical assets except at the highest management levels and the processes for selecting candidates for replacement (for example) are inconsistent.

- The communications activity currently taking place is ad-hoc and functionally driven. In the same way that other plans need aligning to the strategic plan, a communications plan needs to be drawn up that is aligned with the strategic plans. Key messages that flow from the Strategic plan need to be identified and built into the communications plan. **There is an opportunity to set up and use Asset Performance information as the driver for the key message cascade within Enbridge.**

- The documentation of asset management policy and strategy is in place at a detailed level, but scattered among operational documents. At a strategic level, the policy on processes such as asset replacement, inspection and maintenance are **not clearly visible or consistently applied**.

- **At present the collection of data and the highly detailed scheduling of work is presenting a significant burden on EGD**. There are delays in processing critical information, and it is not currently possible to provide timely information to support managing the business. The relative importance of asset information and how it is to be used to support improving business effectiveness is not well understood. Most of the anticipated savings from EnVision is associated with improving the efficiency of delivery.

- Training and succession management is inconsistent and **not always aligned with the either the strategic or business plans**. There are concerns that there is not a co-ordinated approach to ensuring that the appropriate skills and personnel resources will be in place to match business requirements. Succession plans are in place at managerial level, but there was consistent feedback from the assessment indicating concern that engineering training was not adequately co-ordinated to address specific company needs and that skilled craftsmen were not being developed to fill the anticipated gaps as staff retire.

- The concepts incorporated in asset management are widely understood within pockets within EGD, although there is also confusion around what the term 'really means' and the implications of applying it within the company. A short summary to translate the messages embedded in PAS 55 to improve common understanding is included in Section 3 of this report. **This can be translated into a roadshow as a part of the communication plan.**

The overall performance of EGD as an asset management organisation could be improved by joining up some of the business processes, and spreading some of the good practice that already exists in pockets. For example feedback from maintenance should connect to the prioritisation of the asset replacement plan – so maintenance and replacement processes should be connected (operational and capital expenditure). There is good work currently in progress to develop corporate risk management, and highly detailed work is supporting this in engineering. Ideally asset management processes clearly link across the business (Fig 2 is illustrative):

- 'Bottom up'. Information from the assets feeds upwards for consideration and inclusion at a strategic level. The business processes need to facilitate this, the following are illustrative: Data is gathered from asset condition feedback. The trending of data combined with specific incidents initiate engineering investigation which in turn result in changes to policy & strategy. These are realised in the asset replacement and maintenance plans & documentation. Asset based risk evaluation uses the same information and engineering analysis – the asset level risk evaluations support the strategic level risk management.
- 'Top down' – The strategic level management direction and risk management similarly drive down through the business processes to steer and influence the business at operational level. For example corporate risk associated with assets leads to engineering investigations which results in a consistent asset level strategy being applied across the business. Common priorities and

methodologies are translated into specific asset management objectives and performance measures..

This approach ensures that risk management is integrated into the business and that the optimum mix of capital and O&M is achieved. **For Enbridge this could lead to moving expenditure from O&M into capital solutions.** Practical steps include the identification, quantification and targeting of **'lost opportunities'**, the use of modern **risk-based decision tools**, the evaluation of short-term versus long-term benefits (including **Life Cycle Costing** methods), the **multi-disciplined team-working** to identify and resolve systemic technical problems, and a number of **culture change** and **training** initiatives.

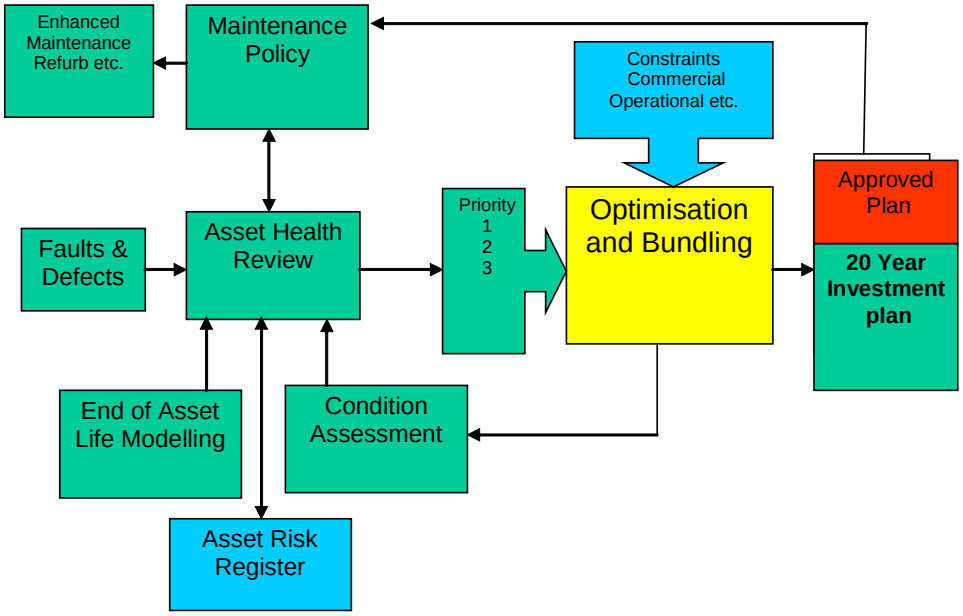


Fig 2

Figure 2 shows in simple block diagram form how processes for condition assessment, maintenance and replacement can be connected effectively. Central to this diagram is an 'asset health review', which is a mechanism for the evaluation of asset condition and performance. Typically this is a 'cross functional' team comprised of knowledgeable staff from engineering and financial disciplines. Information on asset condition and performance is collated using available sources – faults and defects, condition assessment, identified risk issues, maintenance feedback etc. The output from the review includes a prioritised target list for replacement and a target list for maintenance review.

Other elements of the processes are also shown in simplified form. To achieve a practical plan, the replacement work needs to be grouped together into packages or 'bundles' appropriate to efficient contract delivery and in line with various constraints, which may be commercial and operational. A plan is then proposed and prioritised, and progress for approval. It may be that not all of the preferred technical plan can be approved or delivered (e.g. there may be resource limitations or financial constraints). An important aspect of the concept is the feedback from the plan to

maintenance and the asset health review process. This recognises that not all the preferred work is achievable, and initiates modification to the maintenance policy to manage the implications. To use a typical example, if planned replacement of all cast iron main in a preferred time slot were not achievable, this feedback loop initiates consideration of enhanced monitoring or other operational measures to manage the risk until replacement is achieved.

Engineering and operations work well together, and there were many examples of engineering consulting with known expertise residing elsewhere in the business. There was less evidence that best practice and strategic approaches were shared across disciplines, technology and geography, for example practice has evolved differently in, say, Niagara and Central – this may be for good reasons but there is not a good engineering audit trail. In framing and solving future problems it will be necessary to ensure that the environment that company operates within fully supports cross-functional team working. Cross-functional teams need to be established so that they can cover technical, financial and commercial operations to ensure that a complete business solution is obtained.

A common framework for managing 'initiatives' would be advisable, with some commonly recognised criteria for assessing benefit, prioritising, and allocating resource. **A common governance approach with a co-ordinated program plan for multiple projects**, with a senior project board, measured deliverables and key check stages is recommended. A review and realignment of the current initiatives is suggested, with a probable outcome of some deferment or cancellation together with a more balanced level of resource commitment.

The best practice improvement cycle show in figure 3 below is only adopted in an ad hoc mode. There is not a systematic approach to using data and engineering knowledge to review and improve policy – it tends to happen as a reaction to an event or as the result of an initiative. At an organisational level, this assessment has also identified some areas of significant concern; the Asset Management centred concepts of business integration and alignment with business objectives are not in place and need to be established as a matter of priority. These should relate to the use of specific procedures or decision evaluation methods.

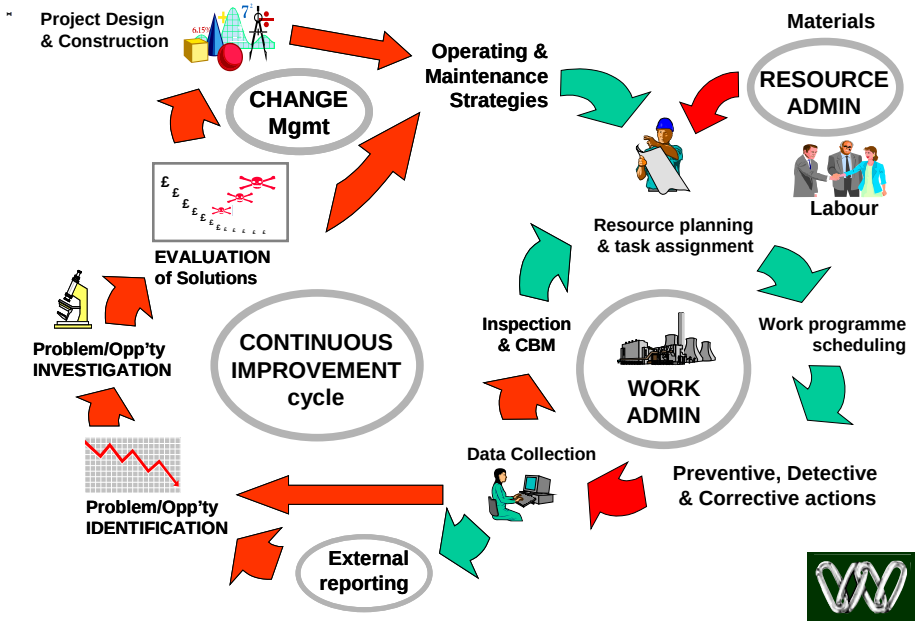


Fig 3 Asset Management Processes

Work Management:

The processes that have been built with EnVision are currently causing business inefficiencies. There is serious concern in the following areas:

- Entry of work in the work management system.
- Entry of site records.
- Work scheduling.
- Information flows across the contractual interface with strategic alliance partners (including invoicing).
- Operational financial information, reporting and forecasting.
- Managing data accuracy.

The focus of the efficiency savings predicted is in the work management cycle (see fig 3 above) where EGD has previously made large cost savings; the continuous improvement cycle is more likely to present opportunities for savings in our view.

The areas where specific opportunity for addressing the current problems at a strategic level are:

- Simplify data entry of work – both the mechanics of data entry and the level of detail currently being programmed. The current strategy appears to be seeking to identify work at a finer level of detail than any of the front line staff or SDA partners consider practicable.
- Review the strategic decision to centralise work scheduling, also clarify the roles and responsibilities of field supervisors and schedulers.
- Review the use and value of data being collected, and rationalise it. Clear linkage to business value to support asset decisions, financial management and performance monitoring are required.

- Appropriate data accuracy, timing and reporting requirements need to be identified. This links to having clear accountability for data, and adequate resources.
- Training and communication. At the appropriate level - particularly to those who are not IT literate.

Although in theory many of these issues should be improved when Envision has bedded down and with the successful implementation of Field Vision, most of these issues actually need addressing very urgently and if this is not done then the impact of Field Vision is likely to be negative. At present the business is working around the IT in order to make the business operate, and Field Vision will expose this and cause further bottle necking.

Conclusions

To summarise, the findings of the interactive review confirmed that EGD is overall a performing well in asset management and would compare favourably with other other Canadian utilities. Measured against world best practice, there are a number of areas where EGD can improve which have been indicated in this executive summary. These are anticipated to result in improved organisational performance and an approach to asset stewardship that would put EGD in a strong position to influence future regulatory strategy and maximise future business opportunities.

2 Introduction

The Woodhouse Partnership Ltd (TWPL) was contracted by Enbridge Gas Distribution (EGD) to undertake work specified in a request for proposal entitled 'Development of a Strategic Asset Management Operating Model', (April 2005, Carolyn Teehan, Program Manager Integrity Group). The principal deliverables set out were:

- Roadmap
- Gap Analysis
- Implementation Plan
- Benchmarking Study
- Competitive opportunity scan

The approach to be adopted was set out in the TWPL tender submission and agreed following presentations to the EGD management team during 17th to 18th June 2005. The major elements to this work were scoped as follows:

Roadmap development. This is a two-step process; an interactive assessment followed by a workshop to develop the roadmap. The interactive assessment, conducted during July 2005, included 50 one to one interviews with EGD staff, and 10 focus group sessions with small groups of staff or alliance contractors. In addition evidence was collected from EGD operational documentation and other sources (such as communications, reports and presentations) to support the review. The review used PAS 55 as a framework and specification to determine how far EGD had progressed towards 'best practice' as set out in this specification. A database was used to assist in the collection and analysis of the results of interviews. As a necessary part of the process, TWPL also examined the 'softer' elements of the asset management culture including leadership and resistance to change. The roadmap is to be developed with EGD management during September 2005, following the production of a draft report of the review findings. The outcome of the roadmap combines gap analysis with a prioritisation process based on benefit and 'time to implement' to ensure that maximum opportunity is identified.

Gap Analysis. Gap analysis was undertaken following the review, and used the concept of 'innocence to excellence' in evaluating the current position of EGD. The method of collecting the interview data allowed the results to be analysed and graphically displayed.

Implementation Plan. Following agreement of the roadmap, a plan will be developed in conjunction with EGD and based on the roadmap, taking due consideration of business priority and other ongoing initiatives.

Benchmarking study. Following the interactive review, consideration will be given during the road mapping process as to whether specific benchmarking activities are appropriate, or the whether site visits/liaison with other organisations will help EGD to align with examples of best practice. An early opportunity in this area was identified with National Grid (UK) to liaise on the rollout EnVision and Field Vision.

Competitive Opportunity Scan. Identification of business opportunities for EGD arising from the adoption of 'best practice asset management'. It is anticipated that this will be an emerging picture moving forwards towards incentivised regulation, with opportunities arising with electricity distribution businesses in Canada.

Interactive Workshops. Workshops introducing decision support tools and techniques for asset management to EGD. Two workshops were added to the original scope of work to look at specific areas of interest arising during the interactive review. These focussed on criticality/asset risk management and APT decision support tools. The concept of asset health review to integrate condition and performance information feedback into AM processes. The workshops were used to explore solutions which could be included in the roadmap with EGD staff.

3 What Should Asset Management Mean to EGD?

One consistent message from the senior team was the desire for a simple message on 'asset management' that could be readily communicated and was relevant for EGD, and to address this specific need this section of the report has been included.

Technically 'asset management' is defined by PAS 55 as:

Systematic & coordinated activities and practices through which an organization optimally manages its physical assets and their associated performance, risks and expenditures over their lifecycles for the purpose of achieving its organizational strategic plan.

This is not an easy or comprehensible message, and trying to improve or simplify the definition usually results in an alternative tangle of words. "Asset Management" is the label being used increasingly to describe the ***coordination*** **and** ***alignment*** of processes in combination with the use of tools & techniques designed to optimise the combination of cost, performance and risk. It is a discipline which is still evolving in response to the challenge of providing long term, sustainable stewardship of assets in a competitive business environment which often encourages short term solutions and cost cutting. The following is an attempt to convey the essence of good asset management:

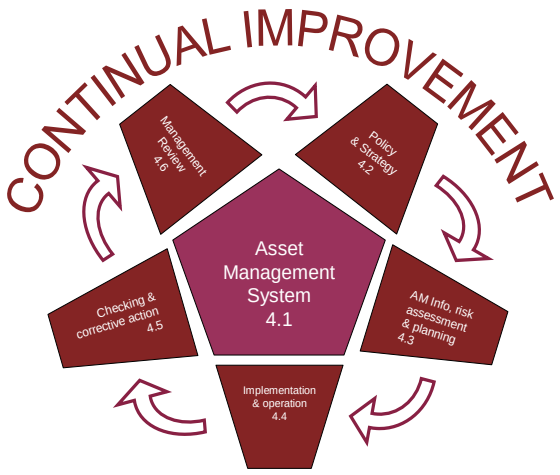


Figure 4

- The needs and welfare of the assets are understood and considered in business terms.
- Asset management takes a responsible long-term view, based on whole life asset costs and business needs.
- Accountabilities, responsibilities and processes are well defined.
- Processes are consistent, joined up and integrated across the business. e.g. Feedback from maintenance is connected to the investment process etc.

- Asset objectives and plans are part of strategic objectives and plans. It joins up through the business so policies lead to strategies lead to plans lead to implementation.
- Appropriate information and evaluation supports decisions on assets – such as replacement or inspection.
- Concepts of risk management, quality assurance, performance management and business improvement are built in and aligned.

The diagram below epitomizes the way that asset management works in practice:

Figure 5

Asset managers usually have to determine the optimum mix of cost, risk and performance and be able to defend the decisions and policies they have adopted. EGD already do 'asset management' – it is the main business of the company. The disciplines and 'best practice' approach evolving across the world is in response to business pressures, often emerging as the result of incentivised regulation, and there are areas where EGD can improve and put themselves in a good position to face challenges ahead.

In concrete terms, following an asset management route is likely to result in:

- Alignment of processes to give efficiency and consistency, leveraging benefit from the investment in information systems and spreading examples of best practice more widely.
- Putting in place a defensible audit trail. What is done, when and why.
- Better use of information to provide informed and consistent decisions.
- Improved planning (especially capital spend) and asset risk management.
- Alignment and control of existing initiatives, including training.
- Better understanding of critical asset information, and the priority of effective expenditure.

This should provide tangible business benefits in the following areas – noting that the reason asset management has developed is to manage businesses facing business challenges:

- Reducing operational costs by removing ineffective tasks and optimising test intervals.
- Shifting some expenditure from O&M to capital.
- Improved internal efficiency by reducing overlaps and process misalignment.
- Improved effectiveness by prioritising and managing initiatives.

- Putting in place a defensible audit trail for plans and policy to use in negotiating future regulatory strategy.
- Position the company to take advantage of competitive opportunity by being able to demonstrate how value can be leveraged from business acquisitions.
- The net effect should improve support to staff, and relieve the observed stress to individuals thus avoiding future poor performance.

It is anticipated that the road mapping and subsequent implementation plan will quantify the potential benefits.

3.1 Integrating Asset Management into the Business

We should stress that Asset Management is fundamentally an *integration* of existing and new 'best practices'. Correcting or improving one part of the jigsaw will yield little or no benefit when compared with a cohesive plan to join the whole together. "Asset Management" is the label being used increasingly to describe the ***coordination*** **and** ***alignment*** of processes in combination with the use of tools & techniques designed to optimise the combination of cost, performance and risk. It is a discipline which is still evolving in response to the challenge of providing long term, sustainable stewardship of assets in a competitive business environment which often encourages short term solutions and cost cutting.

We would like to draw particular attention to this key difference (Asset Management integration concepts, compared to specific 'solutions' or methodologies). One of the clear and widely acknowledged observations of our study was that Enbridge had many examples of good practice or initiatives but they were failing to deliver their potential. This is a common complaint in many industries, and is addressed by a coordinated approach against an outline "route map" that builds each good idea, process or tool into a single picture.

The tighter integration of business objectives into day-to-day practices, and locally-adapted opportunism and continuous improvement, require constant interchange of information, both 'vertically' and 'horizontally'. Planners need to optimise the combined picture. Best practice interchange to and from Asset Management planning is illustrated graphically and is shown below:

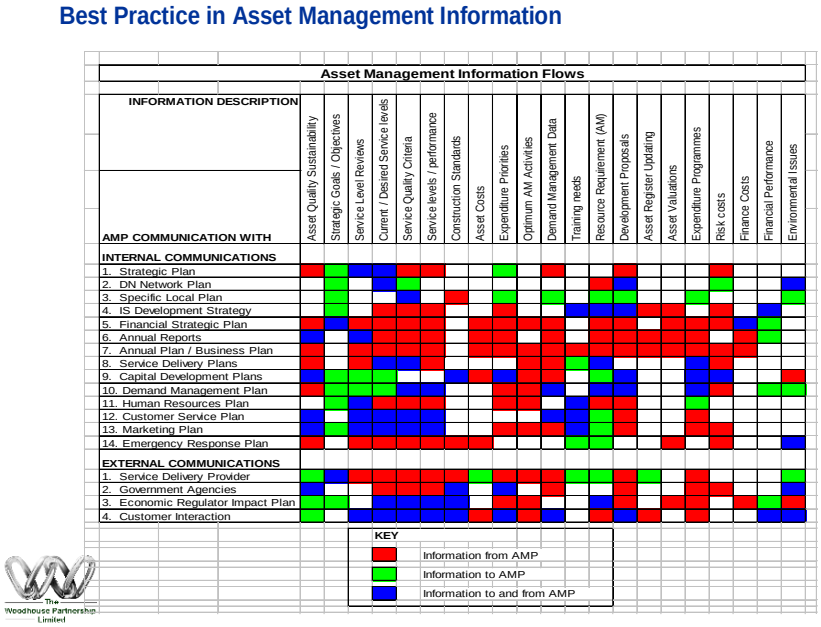


Figure 6

4 Data Sources and Acknowledgements

This report is based on the interviews conducted with many departments and individuals. Approximately 100 staff and contractors took part in this review, either through one to one interviews or through focus groups. TWPL is grateful to all of them. We found an open, honest and constructive enthusiasm for the approach being developed. A full list of all the interviewees, all those involved with the ten Focus Groups and those who attended the two Asset Management Workshops is provided in **Appendix 1.** We would want to extend a "*special thanks"* to the following Enbridge people, without whose help and assistance, this whole complex process of data gathering would not have been so effective.

Carolyn Teehan – whose enthusiasm never seem to waver for a moment along with her desire to squeeze 20 interviews into 1 day ….. plus a couple of focus groups for good measure. Carolyn stretched us to capacity but was always involved in the true sense with finding the solution to any potential problem that might have prevented us achieving what Enbridge wants out of this exercise. Perhaps we should thank her children and her husband as well for tolerating her changing her vacation to meet the needs of this project and being available at the end of a telephone line during her vacation.

Jon Mok – whose help in looking at the records and documentation of Enbridge. His approach was so thorough and we feel sure he now has an insight into Enbridge's policies and strategies that will enable him to mature into a real engineering asset to the company …… plus we'll know who to ask when we want to find a policy document.

Jody Howze – her ways of getting things done we never ceased to admire. If the computers weren't working Jody fixed it …. If the English muffins were not where they were supposed to be at breakfast time for those who'd travelled miles to get to the focus group meeting Jody fixed it ….. if we wanted to know a good restaurant for an evening Jody knew where to go …. If we needed any support at all Jody would be there…. And we truly appreciated it.

To all three of you and the many others that helped us gather our data we would like to say thank you. Your help, support and enthusiasm has been refreshing. The author's of this report believe that Enbridge have the kind of people who can make this approach work and we are determined to do all that we can to ensure that Enbridge is successful ….. we feel we owe to all those who have tried so hard to make our task as successful as possible.

5 Interactive Review Process

This report is based on the interviews (in confidence) conducted with many departments and individuals. The process was conducted by Keith Rimmer and Peter Jay, principal consultants of The Woodhouse Partnership Ltd. during July 2005.

The review comprised 3 parts:

- One to one interviews conducted between TWPL consultants and staff of EGD. The interviews were a combination of questions examining leadership and enabling issues, and questions based on the 'asset management best practice' model contained in PAS 55. The PAS 55 questions were based on a database which allowed interviewees to assess the current EGD position against a scale of 'innocence to excellence' by comparing against examples of each level for a number of questions relevant to their experience, position and knowledge.

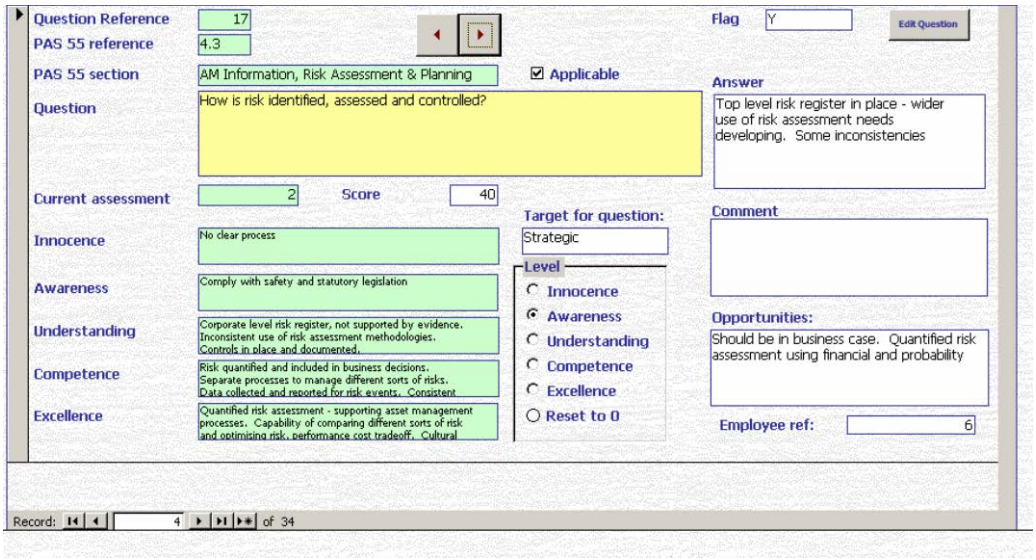


Fig 7

Fig 7 is an illustrative screenshot of a typical question and response.

- Focus groups where peer groups of employees or strategic alliance partners took part in a workshop to identify how EGD was positioned against PAS 55 and capture feedback and recommendations.
- A scan of available documentary evidence to explore the EGD position against PAS 55 in areas which would be recorded in processes, procedures etc. This was also used to validate the findings of the interviews and focus groups. A summary spreadsheet was prepared and used to collate documentary evidence for elements of PAS 55 which were not investigated by interview or required further evidence.

6 Focus Groups

In addition to the one to one interviews with Enbridge staff, the interactive review included 10 focus group sessions of approximately 3 hours duration. This enabled approximately 40 staff from both EGD and strategic alliance partners to contribute to the review in facilitated sessions. These sessions were designed to fact find in a structured way information from the front line staff, supervisors and management teams relevant to Enbridge's current performance against the PAS 55 guidelines.

The focus groups comprised the following. In all cases there were representatives selected from across the geographic areas, to obtain a realistic view and identify differences:

- Front Line Technicians – operations
- Front Line Technicians – services
- Front Line Technicians – construction
- Front line supervisory – operations
- Front line supervisory – technical services
- Front line supervisory – construction
- Operations managers
- Construction managers
- Strategic distribution alliance – services
- Strategic distribution alliance – construction

6.1 Structure

The format of the focus groups evolved during the sessions, but the structure was basically as follows:

1. An icebreaker session where the group were invited to place themselves and the organisation on a grid mapping challenge against support.
2. An introduction to the origins of PAS 55 and a pragmatic view of the characteristics of a good asset management organisation.
3. A facilitated session where the group were invited to identify existing gaps against the idealised model. In later groups the 'model characteristics' were used to benchmark the current situation.

As might have been anticipated, the current issues with the roll out of EnVision inevitably coloured the exercise. We have tried to identify more the underlying issues that are coming through - it is universally recognised that it will take some while before the system has bedded in. Generally it is accepted that eventually EnVision issues will be resolved, and people are aware of the great efforts being made to address the situation.

The simplified vision of a good asset management organisation used to focus the discussion were contained in the following bullet points:

- We know who is accountable for what.
- What I am doing makes sense – we are doing the right things at the right time – things are done for a reason.
- Everyone is pulling the same way, there are not overlaps, and infighting isn't happening
- Initiatives have an aligned purpose and are under control
- We know what state our assets are in and where the poor performers are – we are managing the current situation, and we are planning for the future problems before they hit us.
- Things are challenging – I am kept busy, but I know where I fit in and it is worthwhile.
- Things change – I can make things change – quickly if necessary
- Performance measures relate to things I can influence and they are responsive.
- We know where are at and where we are heading
- Risk is under control - it is a safe system
- Asset information is collected and used – we don't treat all equipment the same way
- There is a sensible and well understood priority to things
- The business is sustainable – we are looking after the equipment for the duration – not for the short term
- Performance of the system is excellent
- Customers service is excellent
- Enbridge is 'responsible & efficient'

In addition, many of the groups were invited to identify one thing they would wish to change at work.

Participants in the focus groups were open and frank in their feedback. In order to respect their confidentiality, the results have been grouped and sometimes paraphrased. The feedback also inevitably represents a view from the perspective of the contributor, and in some cases it is necessary to elaborate in order that the context is understood.

The purpose of the focus groups was not only to identify shortfalls, but also to good practice and opportunities.

6.2 Summary Findings from Focus Groups

Focus group participants were invited to plot themselves on a graph with axes of 'challenge (of the job)' versus 'support (people processes etc.)'. This was partly by way of an icebreaker to the focus group sessions, but the technique has been used in research to identify where people are underutilised or stressed. Fig 8 shows the scatter of feedback from all the participants.

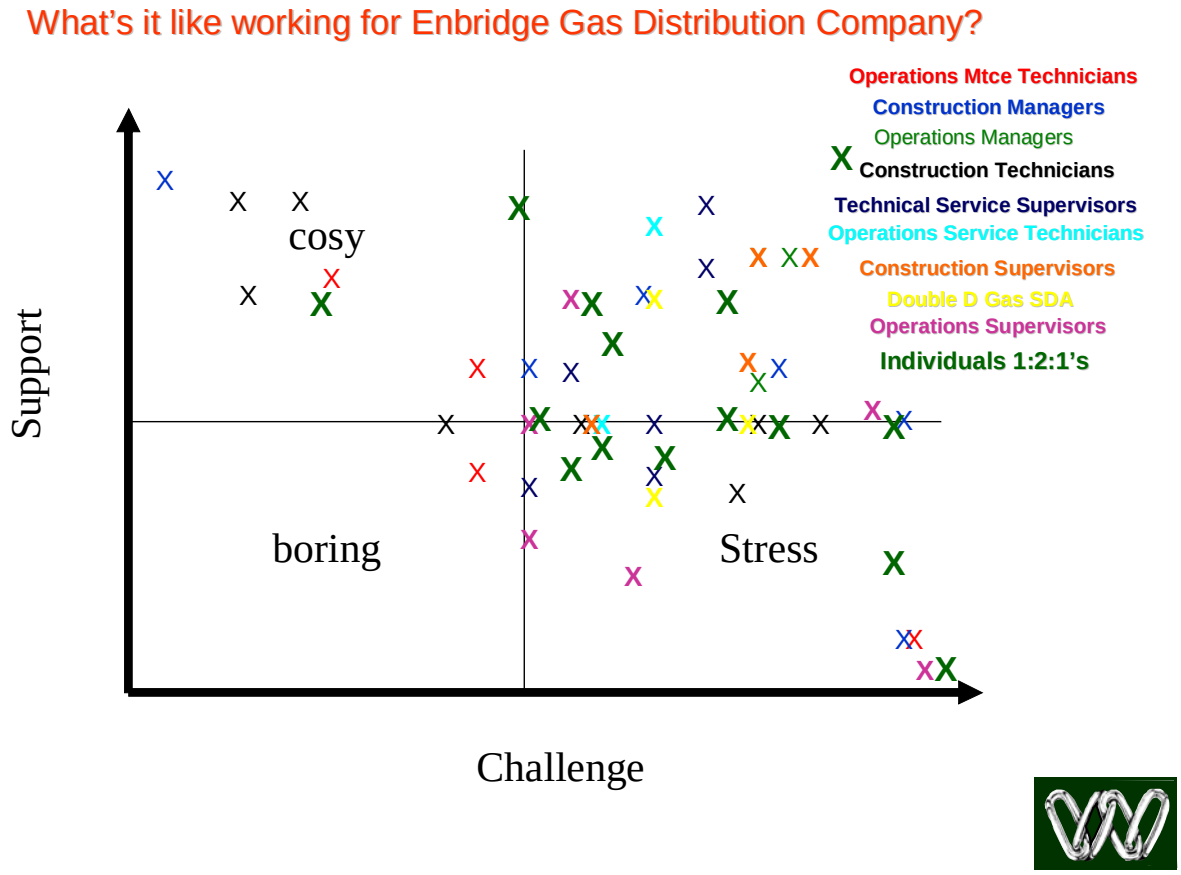
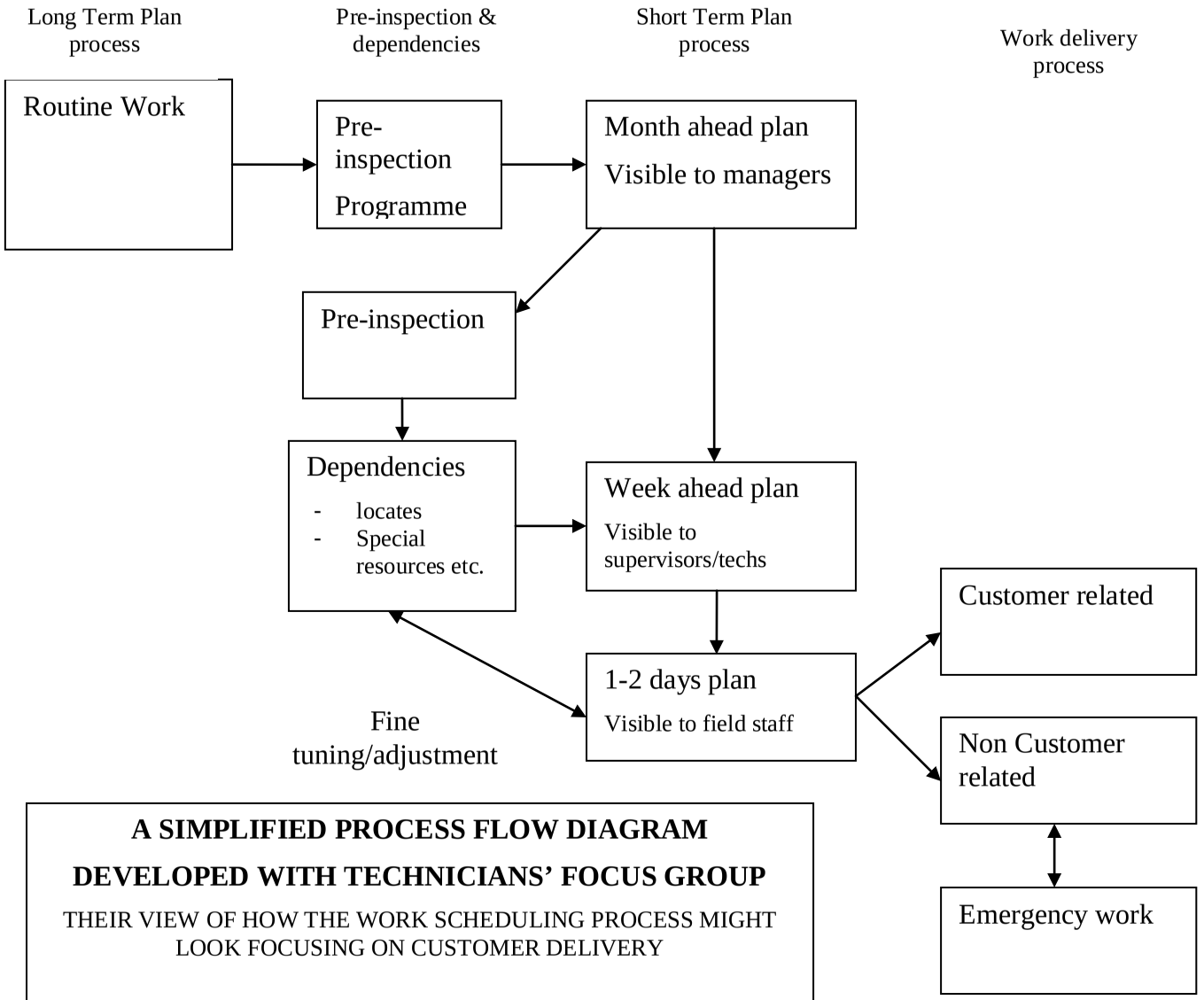


Figure 8

Although the overall clustering of the results might at first appear to be in the top right hand quadrant – which is the sector that research suggests high performing companies are positioned – it is also true that a significant number of individuals are in the 'stress' sector, and a few in the 'cosy' sector. This reflects the observation that some individuals are highly loaded (e.g. initiatives and EnVision related issues), and do not believe that they are being supported by those around them or the organization. The long-term effect of this situation leads to stress, poor performance and may lead to health problems. The situation can be improved by organizational support, including training, even where the challenge is outside the organization's control. Other options include the redistribution of work.

A collation of the feedback from focus groups is included in Appendix 3 of this report.



A SIMPLIFIED PROCESS FLOW DIAGRAM

DEVELOPED WITH TECHNICIANS' FOCUS GROUP

THEIR VIEW OF HOW THE WORK SCHEDULING PROCESS MIGHT LOOK FOCUSING ON CUSTOMER DELIVERY

7 Interview Summary

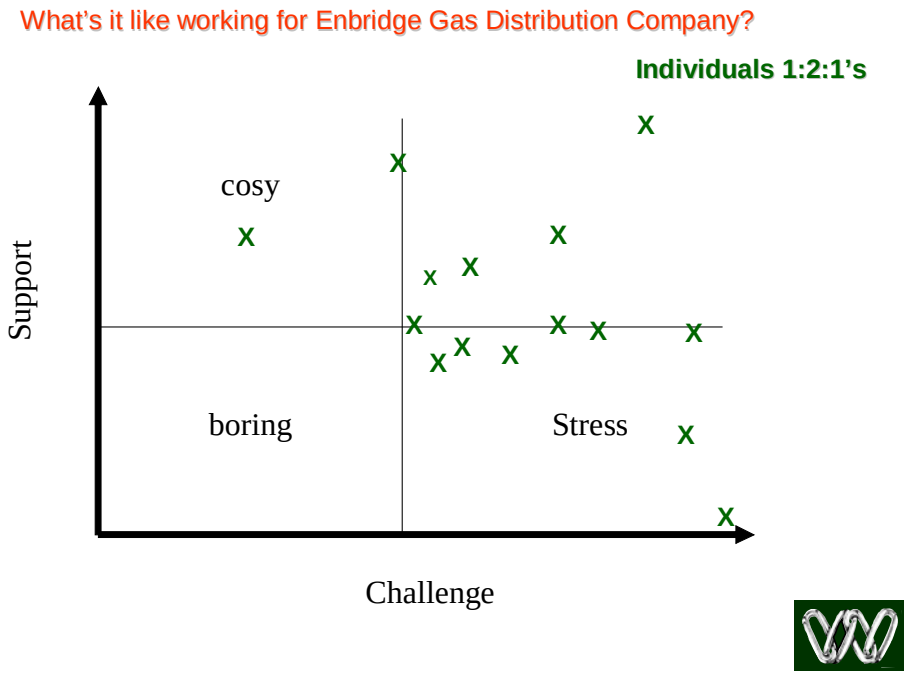


Figure 9

This is equivalent graph from individual interviews to that shown in Fig 8 (section 6.2). The approach was adopted part way through the interview process, in order to provide a more constructive response to the question 'what is it like working for Enbridge Gas Distribution'? It is an observation that among the one to one interviewees, who were mainly managers and team leaders working at the Toronto head office, that a higher proportion placed themselves in the 'stress' sector than those in the focus groups. The same general explanation and comments provided in section 6.2 applies for this exercise.

Each person interviewed was asked for their opinions regarding the deployment of an Asset Management Approach. They were asked to identify both potential benefits of such an approach and any risks they could foresee associated with taking this approach. The questions put to them were: -

Question 1 - "What can you see as the potential benefits of an Asset Management approach?"

Question 2 – "What risks do you see in taking an Asset Management approach?"

Below are their responses to these questions. They have been grouped into 7 general headings and a summary of the results is included below. In appendix 5 are the detailed comments of each individual interviewee. It can be seen from these results that actions will be needed to address the risks that Enbridge staff have identified to an Asset Management approach. This reports has identified those and these will be considered in the development of the road map.

A further question was asked (it became known as the "***broken wand"*** question – people were only allowed to express <u>one</u> wish) of each individual interviewee to help us identify areas of frustration.

Question 3 - "If you could change just one thing at work, what would it be?**"**

This question allowed us identify areas of individual concern and also helped remove any preoccupations with concerns at work that might otherwise get in the way during the interview. A summary of these results is included below and the detail responses are included in Appendix 5.

SUMMARY Question 1

What can you see as the potential benefits of an Asset Management approach?

Total comments = 122

- People 36
- Customer 3
- Society 4
- Key performance 65
- Regulation 8
- Communications 6

SUMMARY Question 2

What risks do you see in taking an Asset Management approach?

Total comments = 102

- Leadership 29
- Communications 8
- People 10
- Policy & Strategy 26
- Resources (People & Time) 24
- Processes 3
- Results Data Capture 2

SUMMARY Question 3

What can you see as the potential benefits of an Asset Management approach?

Total comments = 136

- Leadership 47
- Communications 6
- People 19
- Resources (People & Time) 19
- Policy & Strategy 14
- Processes 8
- Results Data Capture 25

8 Analysis of PAS 55 Database Responses – Innocence to Excellence

50 staff were interviewed individually by TWPL consultants using an electronic questionnaire based on PAS 55, which included guidelines on 'innocence to excellence' expected characteristics in order to try to ensure consistency. The question set comprised 175 questions, designed to explore all aspects of asset management, but these were refined down to an average of around 15 questions that were explored with each interviewee. These were chosen to align with their areas of knowledge, and to try to explore as much of Enbridge's business as practicable in a relatively short exercise. This inevitably means that in for some questions, there are few responses. There are also significant differences around the company in practice, processes and AM capability, and it would be fair to say that for many asset management activities examples were found within Enbridge of 'excellence', but it was also found that there were inconsistencies in the way things were done between departments and geographically. It was also found that there were differences between expectations and theoretical processes and the responses that were given to actual practice. For these reasons, care needs to be taken in analysing the outputs from the questionnaire, and the reported results in the following tables and graphs have included some indicators to assist in understanding. In a number of areas, additional evidence was requested, particularly where an apparent weakness was based on a sample of one or two interviewees, or where the information was best researched by identifying procedures etc. within Enbridge Gas Distribution.

Details of the findings of the questionnaire are included in Appendix 4 of this report, which includes breakouts of the responses in groups of questions aligned to the PAS 55 framework.

9 Interactive Workshops

A total of 20 staff participated in 2 interactive workshops that took place on 16th and 17th August 2005. These workshops were designed to introduce EGD staff to some specific asset management tools and techniques that had been identified during the interactive assessment as possible areas for further exploration. These were grouped into

- A workshop focussing on CAPEX decisions, including asset risk, criticality and decision support.
- A workshop focussing on OPEX decisions including optimisation techniques for maintenance and inspection policy.

TWPL led the sessions, and they were a combination of introductory theory, demonstrations/trials of APT decision support software and breakout sessions looking at how and where EGD might usefully progress and implement the ideas. This report has included the feedback from the sessions as being relevant to the development of the future roadmap.

The groups discussed how they would prioritise all initiatives / project s for both Capital and operational expenditure and how this could be built into the whole life cycle of the asset. They listed the benefits of using these approaches and also the enablers that they recognised should be in place before the use of any IT decision-making tools could assist in this process.

Each group was asked the question "*If you could use this tool on just one problem at work, what would it be*? ". Below are their answers: -

- *When it is worthwhile to spend $ on new CX expansion*
- *For rate case project prioritization*
- *Understand premiums paid*
- *Feasibility for large diameter projects for growth or reinforcement*
- *Cast Iron acceleration – 3yrs vs 6 yrs*
- *Alternative technology development vs investment in infrastructure / growth of traditional plant*
- *Kerotest valve bolt replacement program*
- *Comparison to Engineering funnel (APT Project)*
- *Shortermism vs longtermism*
- *Fully trained, engaged and contributing staff to support effective asset management*
- *Run APT Maintenance/Inspection on all different plant – compare what we are doing now with APT tools results*
- *Data collection – compare APT requirements – check that we have appropriate – sufficient – what is needed*
- *Materials – check frequency of inspections on incoming items*
- *Check reliability of incoming items*
- *Emergency stock – use Spares APT tool*
- *Support Business decision making – how could APT tolls help*
- *Understand how to deal with output of APT tools – resistance to the results – how do we deal with that – how do we get acceptance*
- *Use on Inspection frequency*
- *Failure mechanisms / root cause – feed this information into lifecycle picture – get better understanding on how to do that*
- *Regulators replacement – a good example to use APT tools on*

Each group was asked *"What enablers would be needed to use the tools effectively?"* These enablers were recognised as needing to be in place before the use of decision-making tools could be used effectively. Below are their answers: -

Using a "**Super user**" group as the basis of deploying the decision making tools, then the following enablers are needed: –

- *understanding of the tool – its objectives*
- *Good asset management background*
- *Knowledge of systems / data*
- *Good facilitation skills*
- *Analytical – stats*
- *Engineering – operations – financial understanding*
- *Training*
- *Access to accurate information*
- *Reduction in initiatives & focus*
- *Process to assist/support (process map)*
- *Resources*
- *High level / governing team*
- *Sponsorship*
- *Clear lines of accountability and responsibility*

Each **Contributor** to the input session of using a" **decision-making tool"** would need the following enablers to be inplace*:* -

- *AM background – understanding and its objectives*
- *Data pertaining to their area and expertise*
- *Knowledge of codes, P&P , regulatory, AM process*
- *Time & priority*
- *Corporate sponsor*
- *Strategic goal*
- *Set of deliverables (KPI's)*
- *Culture change*
- *Industry education*
- *Updated job descriptions*
- *Technical specialists*
- *Data mining.*

General requirements/enablers were seen as being: -

- *Built into Business plan – so it's going to happen*
- *Appropriate people*
- *Senior Management endorsement – sponsorship at the top*
- *Need to know beforehand the topics / problems it will be expected to deal with*
- *Need data that is accurate – particularly costs – work needs to be done to identify true costs of activities*
- *Training - in the use of the IT tool – in being able to contribute to completion of data sheets*
- *Time to do the exercises – pull the info together*
- *Resource – sounds like a full time job*
- *Communications to appropriate people – share their involvement – let them know what's expected of them*
- *Supportive law department*
- *Linkage to strategic plans*

10 Documentary and other Evidence

TWPL were provided with access to EGD operational and policy documentation, together with management presentations, reports and the company website. This information was used to supplement and confirm the findings from the interviews and focus groups. A number of elements of the review were more appropriately and easily researched directly from documentary sources. TWPL were much assisted in the collation of the evidence by Jon Mok of EGD who researched evidence from available sources to support the elements of the review which were contained in a summary spreadsheet directed towards documentary evidence of PAS 55 compliance, and included in this report as Appendix 2.

11 Conclusions

11.1 Format and Background

The assessment was based on Publicly Available Specification PAS 55, and follows the framework of this document, which is closely aligned with the format of British and International standards. e.g. ISO9000 series:

In addition leadership and enablers including human resources were included in the review. The outcomes were evaluated and scaled using the following 5 heading:

1 ***Innocence**: the company does not even realise the nature of its problems. Until some imperative for change is acknowledged, there is no cause to question existing practices.*

2 ***Awareness**: at least the existence of problems or opportunities is acknowledged. Active searching for solutions and exploring pilot studies in areas of greatest urgency.*

3 ***Understanding**: both the existence and nature of problems are understood - and a plan is usually in place to address them. 'Getting the basics right' is demonstrably in progress.*

4 ***Competence**: Latest thinking, modern tools and integrated, collaborative improvements are underway with visible hard evidence of their effects.*

5 ***Excellence:** All aspects represent industry leadership with inspirational performance and continuous improvement – likely to be in prime demand for site visits to 'see how it is done'.*

In reviewing the operational aspect of Asset Management in EGD we compared it with the best practice asset management processes as illustrated in the following diagram:

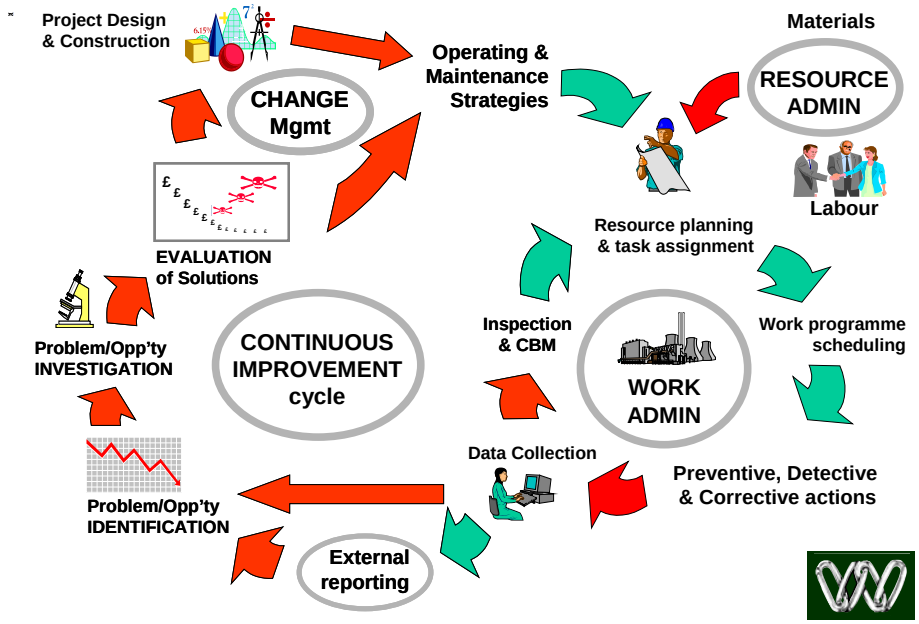


Figure 10

The green-arrow basic Asset Management operations and their connectivity in EGD are not functioning well at present, due to the reorganisation of resource planning and work program scheduling and practical administrative issues with data collection. It is in this work administration cycle that most of the predicted gains from EnVision are anticipated. **The review and realignment of the current processes is urgent.**

The continuous improvement cycle (shown in red arrows), is the area where there is potential for improvement. Most of the policy and strategy relating to this cycle is not well defined or documented. Out of this cycle come both **opportunities for capital expenditure to reduce operational costs,** and the opportunity to **remove or reduce ineffective work** from plan – usually this is achieved by optimising the planned intervals for inspection and maximising condition based or non-intrusive testing.

There are some specific good practice examples in EGD; it should be recognised that equipment failures are always investigated and solutions engineered, there is good pro-active work addressing known degradation modes in pipework, and the Public Safety & Reliability Index is a good example of feedback. More generally the feedback processes are not well understood or fragmented and there is little evidence of cost, risk performance optimisation or whole life cost modelling. It was a general comment that people were uncertain what information was required or how to use it constructively to build business decisions.

The investment in the information system via EnVision and Field Vision should enable asset and finance information to be combined and used with appropriate decision support tools and techniques. This will provide a strong audit path to defend current practices in addition to the development of continuous improvement mechanisms and a well-managed investment programme.

11.1.1 Concepts Awareness

There is a need for a simple clear message to be spread about ‘asset management’. Although there is good philosophical understanding of the concepts, Enbridge need a straightforward message about what ‘asset management’ means to them and how it will be applied. This is probably best addressed by developing some well drafted and simple storyboard (combination of TWPL and EGD input), which includes the specifics of any changes agreed for EGD. There is a need to communicate this appropriately, supported where needed with training.

11.1.2 Culture, Environment and Sustainability

EDG’s culture demonstrates on the one hand that it is capable to respond to change. The number of change initiatives that are underway clearly demonstrates that the people within the organisation are not resistant to change and this is true from Gas Technicians to Vice-Presidents.

On the other hand, the culture of continuous improvement and learning is not embedded. The environment where challenging the status quo or indeed the company direction is still seen as career threatening. This behaviour of challenging what is happening is seen as being outside the norm. This has led to people participating rather than getting fully involved in many of the initiatives. Failure and being associated with a failed initiative, is seen as not good for career paths and status. The understandable reaction as a result of this, has led to many people keeping an arms length approach to their involvement – they limit their commitment to participation only. EDG has an opportunity to influence behaviours so that a continuous improvement approach can become the norm. This will require failures to be identified and analysed so that the lessons can be learnt in a structured way. Failures need to

be turned into opportunities so that a real learning environment can develop. This type of environment will be essential if an Asset Management approach is to be successfully deployed.

Having said that, EDG is ideally suited for a major committed drive to achieve the undoubted benefits in Asset Management that are available. The workforce have demonstrated that they understand and can articulate the benefits of this approach (see Appendix 7.1 "Benefits of an AM Approach" – outcomes of 1:2:1's)

However, the current short-term focus on delivering all the initiatives that the EMT have identified as being a priority for EDG is a significant barrier that needs to be addressed. **(**see Appendix 7.2 "Perceived Risks to Adopting an Asset Management Approach" – outcomes of 1:2:1's and Focus Groups**")** This lack of focus on what is business critical has created a mindset that every initiative or project is the priority. There are in evidence already significant stress indicators amongst those who were interviewed on a 1:2:1 basis or participated in the 10 Focus Groups. For people to be so open in 1:2:1's and so vocal in peer groups (i.e. 10 focus groups) as to the negative impact that this lack of a clear priority and criticality of effort is having on them, in our experience is relatively unique. It is a clear indicator that this issue needs immediate attention. The asset management approach is to focus on what is *worth* doing, *when*, taking correct account of the evaluated risks, and short- versus long-term effects. This approach will begin to address the perceived lack of priority and demonstrate a clear criticality path.

Two workshops were conducted during the Interactive Assessment process that addressed some of the issues identified above. They were: -

Workshop 1 - Criticality Workshop & Workshop 2 - Lifecycle Workshop

The workshops had the opportunity to see how a set of decision making tools could help in the decision-making steps within the asset management process described in section 1 Figure 3. The 2 groups were asked to identify key enablers hat would need to be in place to ensure that the decision-making tools would be used effectively. Both groups recognised that the tools in themselves were only part of the answer and that effort was needed to understand how and when to use the tools. The detailed outputs of these sessions can be found in section 9.3 and the introduction of these enablers will be considered within the development of the roadmap. It was evident to both groups that that some form of cross functionally agreed criticality funnel would be of enormous and immediate benefit in deciding priority for both CAPEX and OPEX initiatives. .

EDG is also a fairly conservative organisation, with many outstanding individuals and substantial engineering experience but there are plenty of subjective decisions and habit-evolved processes. In the future "'new world" of a competitive environment and business/risk accountability this may be difficult for some to digest though there are many who have indicated and demonstrated an enthusiasm for such a situation. So the motivation for adaptation to a new competitive environment will need to involve both carrot and stick – often in these circumstances the prize for success is enormous, and the penalty for inflexibility and the dinosaur approach is severe!

One thing is certain, however. If Asset Management is seen as just another initiative, the new flavour of the month, then it will falter and shrivel away. The specific recommendations below are chosen to minimise this risk.

12 Summary Results

The overall picture is that the company has a number of opportunity areas for improvement which have been summarised in the executive summary – section 1 of this report. For every section of the assessment (with few exceptions) there were found to be examples of good and in some cases best practice but it was often the case that there was inconsistency in application and disconnections between processes. Much of the high level policy and strategy is not well defined or accessible for assets. The following summary graph shows the average scored against the group of questions under each major PAS 55 heading:

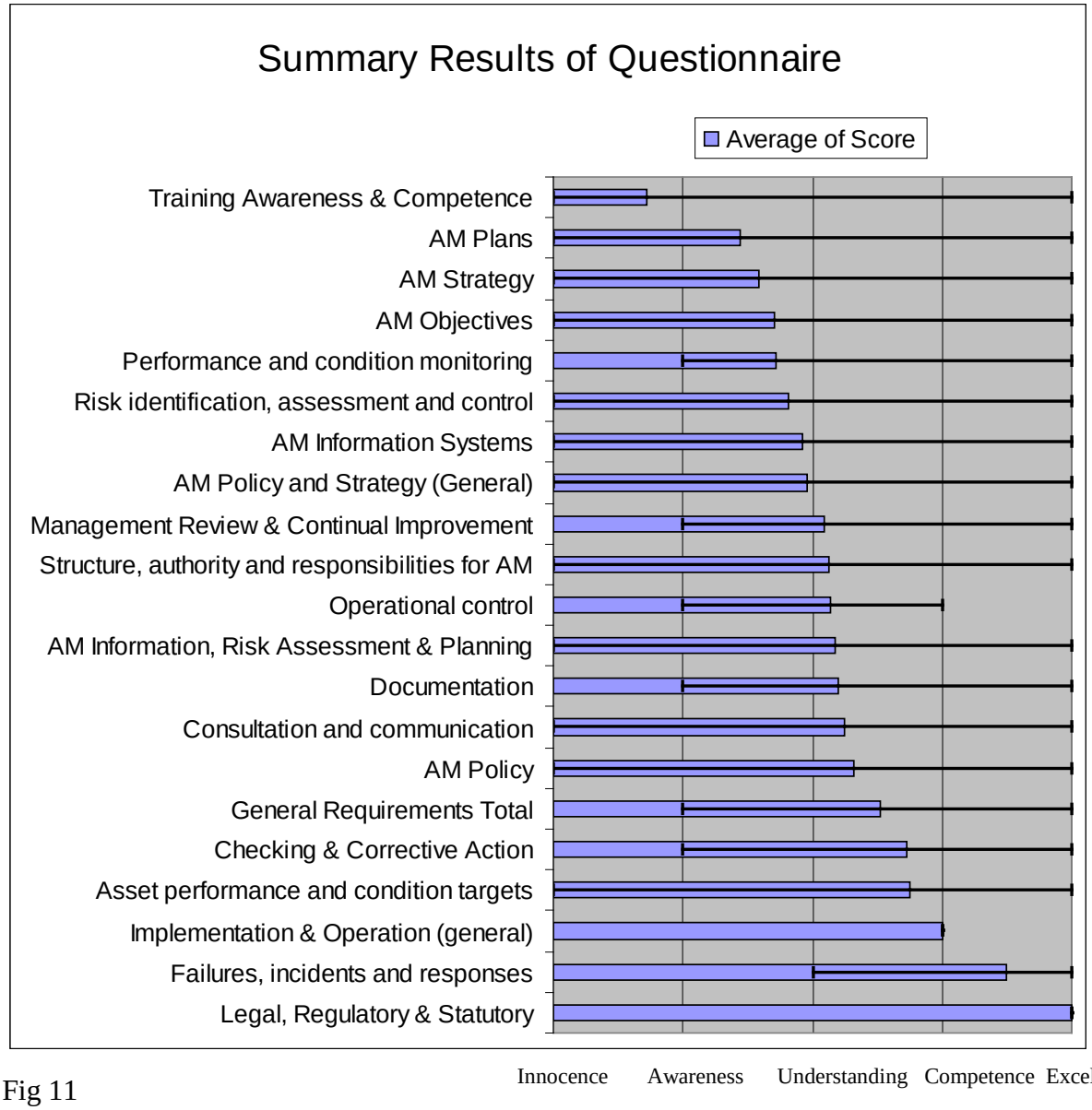


Fig 11

Error bars are used to show the highest and lowest individual assessments recorded. It will be noted that in most cases the maximum score recorded at least one instance where the interviewee considered EGD was in the 'excellence' category. The following table is the source data for this graph, and includes additional statistical data. Section 9 of this report and Appendix 4 provide further discussion of this summary information and supporting detail.

PAS Ref	PAS 55 section	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
4.1	General Requirements Total	27	20	100	40	70.37
4.2	AM Policy and Strategy (General)	42	16	100	20	59.05
4.2.1	AM Policy	38	19	100	20	66.32
4.2.2	AM Strategy	34	22	100	20	51.76
4.3	AM Information, Risk Assessment & Planning	56	16	100	20	63.57
4.3.1	AM Information Systems	75	20	100	20	58.40
4.3.2	Risk identification, assessment and control	22	20	100	20	56.36
4.3.3	Legal, Regulatory & Statutory	3	0	100	100	100.00
4.3.4	AM Objectives	10	27	100	20	54.00
4.3.5	Asset performance and condition targets	56	17	100	20	75.00
4.3.6	AM Plans	27	22	100	20	48.89
4.4	Implementation & Operation (general)	1		80	80	80.00
4.4.1	Structure, authority and responsibilities for AM	47	21	100	20	62.55
4.4.2	Training Awareness & Competence	36	20	100	20	34.44
4.4.3	Consultation and communication	4	34	100	20	65.00
4.4.4	Documentation	5	22	100	40	64.00
4.4.6	Operational control	15	13	80	40	62.67
4.5	Checking & Corrective Action	11	24	100	40	74.55
4.5.1	Performance and condition monitoring	7	22	100	40	54.29
4.5.2	Failures, incidents and responses	4	20	100	60	90.00
4.6	Management Review & Continual Improvement	33	16	100	40	61.82

The following table is a collation of the issues, examples of good practice and identified opportunities gathered from interviews, focus groups and gathered evidence. It has been presented categorised against the headings of PAS 55 and represents a statement of the observed EGD current status and is intended as the basis for generating a 'roadmap' for Asset Management. It should be recognised that the objective of the exercise is to identify improvement opportunities – the comments and recommendations are therefore inevitably skewed to indicate gaps and shortfalls. It should also be recognised that it a TWPL summary which has tried to provide a fair incorporation of the views and opinions expressed by those who participated in the review.

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.1	General	• Understanding of asset management requires clarification • Concern that a long term vision of the management of assets has not been apparent.	• Positive attitude across whole company – keen to engage with best practice, learn from others where appropriate. • *Clear simple message communicated relevant to EGD*
4.2	AM Policy & Strategy	• Some good pockets getting under way – e.g. mains assessment • Manuals not linked to strategy	• High level of benchmarking with other best practice organisations – pulled best practice across the business in the past. • Some HR plans looking at retirement & succession • Procurement area is close to 'excellent' across policy and strategy – *opportunity to spread good practice and retain current position into succession as staff near retirement.* • *Training programme needed – including apprentice training* • *Need to improve documentation and put in practice consistently*
4.2.1	Asset Management Policy	• AM policy not well understood yet.	• VP and top management receptive to AM, pending roadmap. • *If EGD commit to an AM approach this is likely to be addressed via clear communications* • *Renewal policy not in place consistently*
4.2.2	Asset Management Strategy	• Micro management of fieldwork • AM policy is generally based on historic practice and judgement. There is little evidence of the systematic use of condition information or risk management (except mains). • Generally reactive and compliant	• *Efficiency appears to be greatest where planners are co-located with delivery teams, and where some flexibility is allowed for field staff and supervisors to control their own work. Some re-evaluation of the long term strategy may be appropriate.* • *Opportunity to optimise cost/risk/performance systematically using asset information and tacit knowledge – use of decision support tools.*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.3.1	Asset Information System	• Lost productivity due to administering new IT systems. • AM information not well co-ordinated or aligned. Entry of data inefficient. • Forecasting information not available. • People don't understand system – training needed. • Make the work management systems and budget systems work together. • Review processes and align the IT systems with what needs to be done to manage the system efficiently – being driven by what the IT requires. • EnVision impact on strategic alliance commercial interface has been a major problem – invoices very late, and asset information late and inaccurate. Revenue being lost due to late entry into billing system. Using estimated information for payment pending reconciliation – additional administrative overhead to manage system. • Computers in vans – coding work takes too long, resulting in wasted administration time for front line staff and disputes about service quality (time to site). • Benefits claimed as a result of efficiency are not considered credible. • Frustration from those working to make IT work that there is negative response, and it is being used as an excuse to cover other shortcomings – 'is it showing up what was always wrong'.	• *There is already major effort within Enbridge to get the EnVision project back on course. The issues identified here are some of the more serious current issues. There is a need to ensure that the IT system once stable and in place will be suitably aligned to the process requirements of EGD and their contractors. There are a number of issues raised elsewhere (such as records) which are closely related. One of the most significant common issues is the time/resource it currently takes to enter information into the systems, and inaccuracies arising from this part of the process. Significant simplification should be possible.* • *Benefits associated with improved asset knowledge should be considered* • *Quality management of data needs to be addressed systematically.* • *Develop use of information for supporting asset decisions – use of decision support tools etc.* • Finance system (corporate) is working well. • Seeing improvements coming through in some areas – e.g auto generation of maintenance programme, asset data starting to be populated. • Single unified solution – company wide long term vision.

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.3.2	Risk Identification Assessment and Control	• IRAS modelling supporting assessment of risk and business impact from steel mains. • Serious safety risks identified – dealt with at appropriate level • Leak management could be improved. Better recording and monitoring of leaks – pro-active rather than reactive approach. • Lack of understanding behind the derivation of some test procedures, and inconsistency. • Risk management is not clearly linked to business case for the majority of assets. • There are inconsistencies in the approach between asset types. • No clear mechanism to ensure resources to manage risk are built in to future plans.	• Enbridge is proactively monitoring integrity and using the information for planning replacement strategy. • Top level risk register is in place. • Financial information to support individual risk assessments now possible. • *Opportunity for using EnVision generated asset level data to update and underpin risk management work.* • *There are opportunities for reviewing and optimising the inspection regimes.* • *Opportunity to more solidly link risk management into business at asset level, and apply consistent approach.* • *Improve collection of condition data.* • *Spread good practice to other assets.* • *Include linkage of risk management to operational control* • *Opportunity to develop prioritisation/criticality to support risk management at asset level*
4.3.3	Legal, Regulatory, Statutory	• Accountability – Enbridge requiring all safety related issues to be reported via them, but TSSA require direct notification. Has this safety liability driven some QA checking now required by Enbridge?	• *Clear and consistent policy required. The current situation is 'safe' but may result in delays or confusion in reporting, and may be inefficient.*
4.3.4	Asset Management Objectives	• Objectives not visible – reactive rather than proactive • Not formalised • Cost is a major focus – some concerns that the customer is losing out.	• *Opportunity to formalise and link to business cases & risk management* • Enbridge culture has always supported care and concern for the customer. *The issue may be addressed by appropriate communication and reinforcement by management.*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.3.5	Asset Performance and Condition Targets	• Inadequate financial and productivity reporting, and little confidence in data. This is a major concern to managers – they are effectively 'flying blind' • Some scorecard measures are resulting in focus on individual gain, people fulfilling others objectives and inappropriate priority. • Reactive measures, in some cases individual or department unable to influence the measure that they are being scored against. • Lack of clarity on AM targets other than financial	• The Public Safety and Reliability Index is a good example of an asset based relevant set of performance measures. *The scope could be extended to cover more assets and processes.* • Balanced scorecard KPIs fully implemented across business and linked to individual performance. • *Appropriate monitoring and feedback is a priority at operational level.* • *Overall the scorecard system is seen as good and successful, but at technician and SDA level there are opportunities for improvement.* • *Asset related (rather than financial) indicators are infrequent.* • *Longer term (leading) indicators*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.3.6	Asset Management Plans (Including planning process)	• There is not a well understood asset management planning process, and little evidence of the use of whole life costing and similar techniques. • Comes through on an annual basis – can't see the long term. • Lost productivity waiting for 'dependencies' – welder, backhoe etc. • The complexity of planning work through the IT system is resulting in increased administration overheads and in practice many are working around it. Planning work is being administered by clerical staff and needs to be very accurately defined, it also takes a long time to enter work. The clerks are under stress and do not have sufficient technical knowledge to avoid errors. • Lack of forecasting capability at present from the work management system. • Centralised resource planning is not working out. • Information flows – informing the contractor in advance that work is coming up to enable him to more efficiently meet appointment times. • The construction contractors preferred way of matching work to skills is to match the crew to the work, whereas the scheduling process being rolled out assumes a fixed crew and tries to match the work to the crew. • Don't know if the plan is delivered, or if it is cost effective – data is not collected/available – not seen as a priority.	• *A clear AM planning process needs to be put into place linked to asset level knowledge and with business cases supported.* • *A review of the processes which align dependencies, pre-inspections and locates would seem appropriate.* • *Opportunity to develop a longer term plan including scheduling of resources across future years.* • *Monitoring of effective delivery of plan including forecasting needs to be clearly visible.* • Finance staff prepares reports and support the development of business plans in other departments. • Field staff are still well motivated and trying to deliver a good job. • KPIs monitoring and performance monitoring at management level is in place and highly visible.

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.4.1	Structure Authority and Responsibility (includes processes)	• Perception at lower organisational levels that cross organisational issues not adequately considered or joined up. Compartmentalising of problems. • 'Processes and business not joined up' • At high level, business objectives in place, with some constraints imposed by Enbridge on EGD • Accountability and responsibility in planning work is becoming blurred. 'Supervisors not being allowed to supervise'. • Pre-inspection is contentious – the quality and timeliness seems to be suffering. Technicians would like to do their own; supervisors would like to have time to do it (frustrated by being diverted to initiatives & meetings). • Multi-disciplined technicians are frustrated that the workload for Enbridge staff flexes around keeping the agreed level of work with contractors.	• There are some higher level management meeting that regularly discuss cross organisational issues – e.g. EMT meeting • Projects – strong on financial process control at evaluation stage • *Opportunity for improving cross organisational communication channels/multi functional working* • *'Assignment of work by planning is fine but day-to-day running of the job should remain in the field'. This could be a focus for constructive discussion.* • *Project management requires to be more robust – clear deliverables, governance and timescales – current reporting and progress monitoring weak.* • *Start looking at business opportunities beyond current perspective (senior management)*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.4.2	Training Awareness and Competence	• "Half staff have less than 5 years experience – no structured training" • Currently no training on AM tools and techniques, (includes whole life costing, optimisation techniques etc • Technicians feel that they need some more (and appropriate) training on using the work management system. • High proportion of skilled staff due to leave – inadequate succession plan. High turnover of young supervisors and managers moving on results in reliance on experienced technicians in some disciplines. There is a skill gap in some areas – e.g. welding. In some areas skilled staff are having to cover multiple skills, and there are severe resource limitations. The reduction in 'training posts' such as 'welders helper' mean that appropriately trained staff are not coming through. • Training budgets cut as OPEX becomes tighter. • SDAs concerned that they lose staff to Enbridge once they are trained – Enbridge now not training gas fitters. • Field trainers are reputed to be stretched and not able to meet commitments. • People taken out of line for initiatives don't always get brought back in to organisation well – deters some from getting involved. • Some concerns expressed (at senior level) that current compensation package may be falling behind market and thus not attract and retain staff.	• There is a deliberate circulation of staff through Engineering and Operations which promotes good long term working relations • Engineering graduates being taken on, and there are succession plans in place at high level. • Very high commitment to ensuring field staff are appropriately trained & skills retained, includes management of safety and core skills. • *Need a consolidated and consistent approach to training. This will require planning and commitment resources and budget.* • *There is opportunity to work with SDAs and agree a joint training programme or training service.* • *Specific issues on addressing training to support AM techniques such as whole life costing, cot/risk/performance optimisation etc.*
4.4.3	Consultation and Communication	• Frustration that feedback from the field does not seem to have been taken on board – e.g. EnVision, process maps. • Communication is not working well – company policy, direction etc. • Contractors would welcome more open communications, and better forecasting information. • Frustration in some quarters that progress appears to be resisted by union pressure.	• Engineering and Operations consult and pool knowledge • Good long term history of working with unions • *Scope to consider the communications strategy to join up the organisation through the line management route– e.g. team briefs etc.* • *Opportunity to feedback results of the input people have made to business improvement (including this review)*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.4.4	Documentation	• Complexity of and quantity of paperwork. • Policy is not clearly defined, there is some inconsistency	• *Policy level documentation needs to be more visible, consistent and understood.* • *Procedures could be tidied up and simplified. SDAs would like to be able to have constructive input to this.*
4.4.5	Document, Data and Information Control	• Not clear how some information now collected is to be used, but it is time consuming to input it. Reports not seen as useful for driving the business. Some information needs to be collected at source – trying to put it on later using clerks results in errors. • Scorecards used with SDAs – problems with data quality, associated with data entry issues and the current work management process not aligning well with the IT. • Data is being lost from some legacy systems – not compatible with the replacement Envision system	• Technology changes have speeded up access to documents and records. • *Identify information requirements (including quality) to support the business decisions and processes.* • *Clear accountabilities for data and links to processes should result in reducing the volume of data and improving the quality.* • *It may be appropriate to transfer some legacy data if it can be justified by the business – this tends to be associated with asset management data rather than work management data.*
4.4.6	Operational Control	• There are gaps in the definition and communication of AM processes to ensure strategy is being delivered • Control of the work shifting from the front line & supervisors to the scheduler • Very little forward notice of upcoming work – continually in 'reactive' mode – loss of empowerment to field staff. Managers and supervisors feel removed from the planning and believe that the field staff should be better utilised. • Too much time spent in meetings	• *Improved communication* • *Review of operational control processes – linked to planning* • *Clarify accountability – if schedulers are picking up responsibility for controlling work delivery this could be reflected in accountability.*
4.4.7	Emergency Preparedness and Response	•	• Emergency procedures appear to be in place and effective

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.5.1	Performance and Condition Measurement & Monitoring	• Monitoring of asset performance is generally reactive and not systematic as part of the AM continuous improvement process • QA is contentious. Between Enbridge and SDAs each claims the other side are not adding as they have better technical knowledge. Enbridge technicians believe that there is excessive in house QA. There appears to be overlapping and inconsistency of quality checking. • Quality of work is suffering as a result of workload in some areas	• Condition information on mains assets used to support replacement. • Leak information actively monitored and repairs managed – *opportunity to make this more pro-active.* • *Opportunities to improve the use of condition and performance information for continuous improvement.* • *Opportunity for using feedback to improve and optimise decisions.* • *This may be an opportunity for review and alignment of QA – this may result in a reduction of work volume where QA is not appropriate.*
4.5.2	Asset Related Failures, Incidents, Non-conformances and Corrective actions	• Call centre performance concerned some representatives – Enbridge's reputation at stake if information and service is not adequate.	•
4.5.3	Records and Record Management	• Inaccurate records – current loss of accuracy, complexity of updating records, backlog, loss of data from legacy systems.	•
4.5.4	Audit	• The SDA contractors would prefer a more trusting relationship on quality – in house staff view is that they would prefer to increase the level of quality checks.	• *Align QA requirements*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.6	Management Review and Continual Improvement	• Too many initiatives going on - focused on a limited number of staff • Change takes a long time to happen, too many people are involved and people don't want to make a decision. • Continuous improvement using information does not happen systematically. • Not making effective use of data feedback that is becoming available	• Feedback from field and engineering initiative can trigger change in practice – good co-operation and joint working between departments. • *Opportunity to improve responsiveness to feedback via EnVision* • *Improved and aligned project/programme management. Opportunity to put some structure around initiatives and align them with a common goal. A programme of projects will enable priorities and phasing to be agreed, backed by a resource plan and a 'project board'. Milestones and deliverables should be aligned.* • *A reassignment of representatives to balance it out would be useful. There are examples where senior managers are trying to do this, but this is exceptional and some individuals are overburdened.* • *Opportunity to develop a management review process for assets.*

APPENDIX I – Interview Focus Group and Workshop Participants

The Woodhouse Partnership would like to acknowledge and thank the following EGD employees and alliance partners who participated in this review.

Individual one to one sessions:

Jim Schultz	President Enbridge Gas Distribution
Arunas Pleckaitis	VP Operations, President GNB
Marika Hare	General Manager, Central Region
Rob Fennell	General Manager, Toronto
Greg Fabbruzzo	Mgr Surveys & Training, Toronto and Central
John Kordan	Mgr Measurement & Regulation, Toronto and Central
John Oakley	General Manager, Niagara
Jamie Milner	General Manager, Eastern Region
Lloyd Chiotti	General Manager, Envision Program
Nick Thalassinos	Mgr Business Transformation Development
Jim Alton	Mgr Field Force Mobilization
Anne Creery	Mgr Business Change Realization
Cathy Hanlon	Group Mgr, Work Mgmt System
Lynn Dekker	Mgr Work Mgmt System - Niagara
Debbie Brault	Mgr Work Mgmt System – Eastern
Lisa Lawler	Mgr Strategic Distribution Alliance
Catherine McCowan	Mgr Operations Services
Scott Player	VP, Finance, CFO
Bill Ross	Director Finance and Control
Lee Liauw	Mgr Special Projects & Capital Appropriations
Tom Ladanyi	Mgr Budgets and Planning
Narin Kishinchandari	Chief Accountant
Mina Torriano	Supervisor, Asset Reporting and Analysis
John Briggs	Mgr Operations Finance
Sagar Kancharla	Mgr Financial and Economic Assessment
Joanna Makomaski	Mgr Risk Assessment
Vivian Sim	Mgr Governance and Process Excellence
Lino Luison	VP, Opportunity Development
Kerry Lakatos-Hayward	Mgr Strategic Planning
John Bayko	Director Sustainable Growth
Glenn Beaumont	VP, Engineering
Rob Fox	Chief Engineer
John McClintock	Mgr Special Projects, Engineering
Cindy Graham	Mgr Integrity Management
Carolyn Teehan	Program Mgr, Integrity Management
Rocco Riccio	Spvr Facilities Services
Rob Milne	Mgr Distribution Planning
Carmelo Tancioco	Mgr Special Projects, Distribution Planning
Russ McLean	Mgr, GIS and Records Administration
Randy Wilton	Mgr, Network Analysis
Doug Lapp	Chief Operations and Logistics Engineer
Roza Kohen	Mgr Asset Optimization
John Smith	Mgr Purchasing
Reinhard Langos	Mgr Environment, Health and Safety
Barry Goulah	Mgr Systems Measurement
John Marshall	Mgr Engineering Operations
Chris Moore	Mgr Engineering Construction
Geoff Bowkett	Mgr Engineering Measurement & Regulation
Jane Haberbusch	VP, Human Resources
Tara Seon	HR, Business Partner, Engineering
Byron Neiles	VP Legal, Regulatory and Public Affairs
Patrick Hoey	Director, Regulatory Affairs

Focus Groups Participants

Operations, Maintenance Technician	Angelo Bantis
	Angelo Firrincieli
	George Collins
	Peter Bodington
Construction Manager	Bruce Rozycki
	Byron Madrid
	Chris Moore
	Chuck Sauer
	Cliff Clark
Operations Manager	Jim Tweedie
	John Cramm
	John Marshall
	Lise Meloche
	Neil Harte
	Phil Mannell
Construction Technician	Dave Travis
	Rodney Smallwood
	Royce Sager
	Todd Stiles
Technical Services Supervisory	Dean Miller
	Don Binsell
	Ken Murray
	Roger Mitchell
	Roland Saggiorato
Operations, Service Technician	Brian Walker
	Luke Scully
	Dan Borris
	Jim Stirling
Construction Supervisory	Mark Grimley
	Gord Lewis
	Shahid Bari
	Vic Teso
Operations Supervisory	John Plourde
	Mike Johnson
	Tony Ciccone
	Laurent Breton or Henry Ostaszewicz
Strategic Distribution Alliance - Double G Gas Services (Service Partner)	Rob Drysdale
	tbd
	tbd
Strategic Distribution Alliance - R.B. Somerville (Construction Partner)	Gord Butson
	Stacey Cunnington
	Steve Hall

Below is a list of Attendees for the 2 Interactive workshops

Engineering	Finance	Operations	Human Resources
Rob Fox	Linda Au	Mick	Tara Seon
Geoff Bowkett	Sandee Qian		**Others**
Jon Mok	Bill Ross	Nick Thalassinos	Carmelo Tancioco
Trevor Tuck		John Kordan	*Distribution*
Carolyn Teehan		Deirdre Broude	*Planning*
Cindy Graham		David Noseworthy	Earl Wotton
Shelley Van Sickle		Greg Fabbruzzo	*Purchasing*
Chris Moore			

APPENDIX 2 Documentary and Other Evidence

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2009	1.b.1	Does the organization establish and maintain an organizational structure of roles, responsibilities and authorities, consistent with the achievement of its asset management policy, strategy, objectives, targets and plans?	Yes. In terms of operating a safe and reliable gas distribution system, there exists accountabilities of who does what (i.e. operational procedures, financial investments, etc.)	EGD has yet to explicitly define an Asset Management policy, strategy…	4.4.1 Structure, authority, and responsibilities for asset management
2012	1.e.4	Does top management provide evidence of its commitment to the development and implementation of the asset management system (processes) and continually improving its effectiveness by:	-	-	<u>EGS Strategic Objectives (as of 2005)</u> • Best-in-class safe and reliable operation of our distribution systems • Increased customer satisfaction by meeting our commitments and enhancing value in our services • **A leader in utility asset management** ***(This objective is for "us" to define)*** • Enhanced shareholder value and earnings growth • Improved system gas options for customers, providing security of supply and more stable pricing • A healthy and productive work environment
2013	1.e.4.1	a) appointing a member of top management who, irrespective of other responsibilities, shall be responsible for the overall design, maintenance, documentation and improvement of the organization's asset management system (processes)?	Glenn Beaumont (VP Engineering), is responsible for setting the policies and procedures with respect to the Company's assets. Although it is not explicitly stated within a specific document, the VP of Engineerings accountabilities can be found across a number of different sources: Pipeline Intergrity Management Program Manual, and the Corporate Emergency Response Manual	The Pipeline Integrity Management Program manual governs EGD's high stress steel mains (approx. 1% of **total** system plant)	
2014	1.e.4.2	b) appointing members of management whose responsibility is to ensure that the assets or group of assets deliver the asset management strategy, objectives and targets (in accordance with the asset management policy)?	Glenn Beaumont, VP Engineering, is responsible for setting the policies and procedures with respect to the Company's assets. Although it is not explicitly stated within a specific document, the VP of Engineerings accountabilities can be found across a number of different sources:		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2015	1.e.4.3	c) appointing members of management who has/have been given the necessary authority to achieve this?	Not explicitly... But as a company, at all levels of the organization, employees have personal objectives/scorecards that tie into, and support, EGD's overall strategic objectives. Because personal scorecards ultimately are reflected in the corporate scorecards, compensation for employees is based on their ability to meet their objectives, which in one form or another, relates back to EGD's corporate strategy		
2016	1.e.4.4	d) identifying and monitoring the requirements and expectations of all of the organization's stakeholders and taking appropriate and timely action, to the extent that these have implications for the org.'s management of its assets?	… We have interpreted this as meaning EGD's ability to meet its objectives as stated in our "Balanced Scorecard", which considers the expectations of employees, customers, shareholders, and regulators		
2017	1.e.4.5	e) ensuring that the asset management policy and strategy are consistent with the organizational strategic plan?	… Design and operational policies & procedures are developed to ensure safe and reliable operation of our distribution system		-
2022	1.e.4.10	j) ensuring asset-related risks are evaluated and included in organizational risk assessments and risk registers as appropriate?	Yes. Asset related risks have already been evalutated for the following: • Service (copper) • Mains (High stress steel, steel, plastic, cast iron, bare steel)		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2023	1.e.4.11	k) ensuring the viability of the asset management strategy, objectives, targets and plans?	Yes. EGD's strategy is revisited annually and individual objectives, targets, and plans are also set on an indiviual basis. Performance with respect to these plans are evaluated and compensated for, on an annual basis		
2024	2.a.1	Do you have written and published policies and strategies covering the following?	-	-	For a complete list of manuals maintained by the Engineering Department, as a whole, please let me know
2025	2.a.1.1	Legislative and regulatory compliance	EGD's policy and procedures are updated, governed, and regulated, by a number of legislative and regulatory bodies as they become available. These various industry standards are respectively relflected in nearly all of our manuals, where EGD often goes above and beyond what is expected of us to ensure a safe and reliable distribution system. Some noted standards include: • CSA Z662-03 • ANSI: B31G • ASME: B31.8 • NACE: RP0502-2002 • NACE: RP0102-2002		EGD is also involved in a number of committees - CGA, AGA, CSA - where we benchmark ourselves against leading best practices as a measure to add value to our service
2026	2.a.1.2	Organisation's Total Role in Society	At the corporate level of Enbridge Inc., EGD's role in society can be found in the "Enterprise Policy Manual: *Corporate Social Responsibility chapter"*		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2027	2.a.1.3	Environmental policy	EGD's commitment to enviromental stewardship can be found across a number of various manuals, such as EGD's Construction and Operating & Maintence Manuals (both maintained by Engineering. The end goal is to have no accidents and cause no harm to the environment. This statement is also reiterated in Enbridge Inc.'s "Environment, Health & Safety Policy"		EGD also has a manual entitled "Environmental Management Manual for Environmental Protection during Pipeline Construction", which is maintained by Engineering
2028	2.a.1.4	Harnessing beneficial technology	EGD has several formalized programs and business groups with the objective of harnessing new technologies. This includes the "New Product Introduction" program and the Energy Technology group of Opportunity Development Department.		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2029	2.a.1.5	Knowledge management	• EGD has an "Annual Succession Management Process" in place to mitigate the effects of a retiring workforce. • Engineering manuals are also develop ped with consultation of people with field expertise (i.e. SME's) so as to document the knowledge of others. This process extends to all employees as they can give their input on any manual changes. • In Engineering, the policy for training new engineers falls under the Engineering Professional Development Program (EPDP), where engineers are seconded to different aspects of the Company with the objective of broadening the knowledge base and experience		
2030	2.a.1.6	Plant and equipment selection	• Plant and equipment selection is documented across a number of different manuals including the Planning, Design, Records (PDR) Manual, Material Specifications manual, Construction manual and the O&M manuals… • The NPI program and Engineering's own evaluation of tools is also largely responsible for the selection of appropriate tools and equipment		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2031	2.a.1.7	Whole Life Asset Management plans	DMS framework	DMS	DMS is to be institutionalized thorughout the organization by Dec. 31/2005. DMS is a system that provides rigor to the application and governing of critical business process, which are designed to support the safe and reliable distribution of natural gas, including the integrity of our system.
2032	2.a.1.8	Production or Operations	O&M Manual		Maintained by Engineering
2033	2..a.1.9	Maintenance and Renewals	O&M Manual		
2034	2.a.1.10	Intrusive and non-intrusive Inspection	• Operating & Maintenance (O&M) Manual • Pipeline integrity Management Program Manual • Construction Manual • Quality Acceptance Manual • Planning, Design and Records Manual		
2035	2.a.1.11	Procurement and supplier relations	• The Purchasing group has their own set of Policies and Procedures that govern this	Going by the fact that these policies and procedures are not easy to obtain, there is opportunity for improvement	
2036	2.a.1.12	Materials inventory and stock control	Material inventory is maintained by our Markland Warehouse, levels are set by Planning and Engineering, and supported by the Material Specification manual		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2037	2.a.1.13	Contractor management and outsourcing	• General Service Contracts, and RFP's • Where appropriate, portion of EGD's manuals are sometime given to contractors		
2038	2.a.1.14	Continuous Improvement	EGD is in the process of implementing a framework of continuous improvement called a Distribution Management System (DMS)		The goal of DMS is to ensure the safety and reliability of our gas distribution service, through the management of our existing lifecycle functions such as Network Analysis, Design and Records, Integrity Management…etc
2039	2.a.1.15	Change control and auditing	• Change Control: Change process for the reprint of manuals • Operations processes is audited by the Quality Acceptance group		
2040	2.a.1.16	Technical failure investigation	Yes. EMEC: The Material Fault Program		Allows field workers to report both actual & potential problems. Members from Purchasing, Operations, and Engineering will meet periodically to discuss any field problems or material failures.
2060	2.f.3	Does the AM Policy provide the framework which, together with the organizational strategic plan, enables the asset management strategy and specific asset management objectives, targets and plans to be produced?	-	-	4.2.1 Asset management policy
2061	2.f.4	Is the AM Policy consistent with the organization's overall risk management framework?	The risk management framework is still in development, where the focus has been on risk assessments of specific plant		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2063	2.f.6	Is the AM Policy appropriate to the nature and scale of the organization's assets and operations?	Policies at EGD cover a broad area ranging from Planing, O&M, Construction, Emergency response, safety, etc.		
2064	2.f.7	Does the AM Policy clearly state the overall/broad asset management objectives?	No. As stated in the O&M Manual and the Pipeline Integrity Management Program Manual, the objectives are for continured safe, reliable and environmentally responsible service. No mention is made of sustainability, although this may be inferred.		
2065	2.f.8	Does the AM Policy clearly state that asset management shall be directed to achieve the organizational strategic plan?			
2075	2.g.3	Does the AM Strategy identify and clearly state the function(s), performance and condition requirements of its assets, asset types or asset systems as appropriate?	No. EGD's Strategic Plan does state that EGD aims to become a leader in utility asset management, however the work of TWPL and the Integrity Management dept, have still to define the overall strategy	EGD has yet to explicitly define an Asset Management strategy…	4.2.2 Asset management strategy
2076	2.g.4	Does the AM Strategy identify and consider the requirements of all other relevant stakeholders including health, safety, sustainability and environmental performance requirements?	Yes. Enbridge exercises due diligence whenever possible in adhering to regulator codes and regulations		
2077	2.g.5	Does the AM Strategy take account of the risk assessment (see 4.3.2) and identify those assets or asset systems that are critical;?	In terms of which assets are critical, this as not been conclusive, however the Integrity group did identify levels of risk associated with mains, which has supported EGD's decision to accelerate the replacement of the cast iron in our system		
2078	2.g.6	Is the AM Strategy optimised?	No…there is always room for improvement		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2079	2.g.7	Does the AM Strategy provide sufficient information and direction, including an action plan with defined timescales and responsibilities, to enable effective asset management objectives, targets and plans to be produced?	Action plans with defined timescales are present, as part of individual scorecards and performance objectives. It's relation to EGD's overall asset management strategy can be inferred.		
2083	2.h.1	Does the organization establish and maintain documented asset management objectives at each relevant function and level within the organization?	At every level of the organization, employees have appropriate asset related objectives. Certain deliverables at the respective levels of involvement will be reflected in respective scorecards.		4.3.4 Asset management objectives
2084	2.h.2	Are the objectives derived from and consistent with the asset management strategy?	Yes. Individual scorecards tie into the corporate scorecard. Furthermore, annual budget allocations are linked to EGD's strategic objectives		
2085	2.h.3	When establishing and reviewing its objectives, does the organization consider its legal, regulatory, statutory and other AM requirements?	• Yes. All objectives and action plans are in place to help ensure compliance with technical regulatory requirements • EGD also has a full process for financial regulation		
2086	2.h.4	When establishing and reviewing its objectives, does the organization consider asset-related risks?	• Formal risk assessment supported our decision to accelerate EGD's cast iron replacement • Risk is "informally"/loosely incorporated		
2087	2.h.5	When establishing and reviewing its objectives, does the organization consider technological and other options?	Yes. EGD has Energy Technology and Engineering Standards & Technical Services groups focused on short-term and long-term technical advances		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2088	2.h.6	When establishing and reviewing its objectives, does the organization consider financial, operational and business requirements;?	Yes. Each group (i.e. Finance, Engineering, Operations) have their respective focii	Probably an opportunity of combining	
2091	2.h.9	Are the organizations AM objectives quantified (where practicable)?	Yes. Scorecards and Financial Targets		
2116	3.f.3	Does the organization consider its long-term asset management training requirements and plan for them accordingly?	Yes. The DMS framework that is in the process of being implemented will formalize the process of management training and succession planning	DMS	4.4.2 Training, awareness and competence
2125	4.8	How are construction & project management activities controlled?	• Certain contractors are accountable for certain activities • In Engineering, projects are delegated to Project Leaders via a funnel process that ranks them with respect to priority		
2127	4.1	Is there a formalized commissioning and maintenance plan for new assets?	Yes. This is defined by the O&M, Construction, and Measurement & Regulation Manuals		
2130	4.13	How are transport and logistics planning carried out?	Managed through Operations & Logistics		
2136	4.19	Are there service level agreements with all key suppliers/contractors?	Yes.		
2140	4.23	Are inventory levels of spares & materials evaluated for cost & risk?	No… inventory levels are based on usage	Yes	Some of the spare materials and equipment are housed at the vendors till needed
2141	4.25	Are workshops and service centres adequately resourced?	Yes. Min/Max reports for individual components are run on a weekly basis to determine when to replace components. This range is based on historical data from past 1-2 years. Defined by Distribution Planning.		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2145	4.29	Is there a computerised AM Information Management System that effectively manages the following items?:	-	-	4.3.1 Asset management information system
2146	4.3	Asset register	This information is captured in a number of systems: PMTS, SCADA, GIS		PMTS & GIS capture data on EGD's in-ground plant
2147	4.31	Planning and scheduling records and information	Yes. STORMS		
2148	4.32	Work order feedback	Yes. STORMS		
2149	4.33	Job ageing analysis	No.		
2150	4.34	Remote data capture	• Yes. Field Force Technology (soon) will allow records to be updated in real-time • GPS is a pilot technology that's in place to allow for data capture via handhled devices		
2151	4.35	Condition monitoring data	SCADA maintained by the Gas Control group		
2152	4.36	History records	GIS, iViewer, PMTS, Data Packs (18-24 months away)		
2153	4.37	Data and IT infrastructure	IT department uses: Argis 8.0, Novadigm, Radia Client 3.1, Radia 4.5		
2154	4.38	Provides information and data on:	-	-	
2155	4.39	Assets	PMTS, GIS , iViewer, STORMS		
2156	4.4	Work	STORMS		
2157	4.41	Resources	STORMS, done through Work Management group		
2158	4.42	Costs	EFS, built into STORMS		
2160	4.44	Is there a Predictive Maintenance Programme that effectively manages the following?:	-	-	"Predictive Maintenance" is done based on the asset's current condition

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2162	4.46	Inspection programme	These are done to an extent at EGD, however there doesn't appear to be an explicit programme in place, rather they are a part of EGD's operations procedures		
2163	4.47	Corrective Maintenance			
2166	4.5	Is there a programme geared to prolong the life of assets such as?:			
2171	5.b.3	Does the AM information system include provision to support the development and implementation/achievement of the asset management policy, strategy, risk identification, assessment and control, objectives, targets, plans?	Yes		4.3.1 Asset management information system (Is the IT system providing adequate information to understand the condition of the asset (condition, date issued, plant history)
2172	5.b.4	Does the AM Information System support all of the requirements related to implementation and operation (see 4.4), checking and corrective actions (see 4.5) and the management review (see 4.6)?	Yes		
2174	5.b.6	Where separate AM information systems exist does the organization ensure that the information provided by these systems is consistent?	The various information systems have their own respective purposes, and the presentation of the information is suited to its need		
2175	5.c.1	Does the organization establish and maintain procedures for the ongoing identification and assessment of asset and asset management-related risks, and the identification and implementation of necessary control measures?	Yes. Risk assessments on copper services lead to definite changes	Some changes were implemented, though the implementation was inconsistent	4.3.2 Risk identification, assessment and control
2176	5.c.2	Does the risk assessment consider the probability of an event and all of its consequences?	Yes		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2177	5.c.3	Does the risk assessment include physical failure risks, such as functional failure, incidental damage, malicious damage or terrorist action?	Yes, but malicious or terrorist action is not looked after - these are looked after by the Corporate Security group		
2178	5.c.4	Does the risk assessment include operational risks, including the control of the asset, human factors and all other activities which affect its performance, condition or safety?	Yes. Installation related risks were accounted for		
2179	5.c.5	Does the risk assessment include natural environmental events (storm, floods, etc.)?	Yes. Lightning and settlement issues		
2180	5.c.6	Does the risk assessment include factors outside of the organization's control, such as failures in externally supplied materials and services?	Yes. Material defects were accounted for		
2181	5.c.7	Does the risk assessment include stakeholder risks such as failure to meet regulatory performance requirements or reputation damage?	Yes. Dollar values were factored in for regulatory and corporate image impacts.		
2182	5.c.8	Does the risk assessment include asset-related design, specification, procurement, construction, installation, commissioning, inspection, monitoring, maintenance, refurbishment, replacement, decommissioning and disposal risks as appropriate?	No.	Maybe…	
2191	5.c.17	Does the organization ensure that the results of these assessments, and the effects of these controls, are considered and where appropriate provide input into the organization's overall risk management framework?	Yes… but…	Better learn how to integrate into the organization.	
2192	5.c.18	Does the organization document and keep this information up to date?	In terms of risk assessment, the information has been documented, however it is not updated annually	Simplify the process of updating the info	

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2193	5.c.19	Is the organization's methodology for risk identification and assessment defined with respect to its scope, nature and timing to ensure it is proactive rather than reactive?	Yes. Risk assessment were proactively done on mains with the purpose of increasing our understanding		
2194	5.c.20	Does the organization's methodology for risk identification and assessment include, where appropriate, the assessment of how risks change or can change over time and usage?	Some. IRAS accounts for changing risks over time, while manual risk assessments do not		
2195	5.c.21	Does the organization's methodology for risk identification and assessment provide for the classification of risks and identification of those that are to be avoided, eliminated or controlled by asset management objectives, targets and plans?	Yes, but nothing done with it in terms of asset management objectives		
2196	5.c.22	Is the organization's methodology for risk identification and assessment consistent with the organization's operating experience and the capabilities of risk control measures employed?	Yes. Based on empirical knowledge and hard data: reflective in "residual risk" (from the work done by technical services)		
2197	5.c.23	Does the organization's methodology for risk identification and assessment provide for the monitoring of required actions to ensure both the effectiveness and the timeliness of their implementation (see 4.5.1)?	No.		
2198	5.d.1	Does the organization establish and maintain a procedure for identifying and accessing the legal, regulatory, statutory and other AM requirements that are applicable to it?	Yes. All applicable regulatory standards are recognized immediately and appropriate manuals are updated accordingly		4.3.3 Legal, regulatory, statutory and other asset management requirements
2199	5.d.2	Does the organization keep this information up-to-date?	Yes. This is the responsibility of Engineering		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2201	5.e.1	Does the organization establish and maintain documented performance and/or condition targets appropriate to the needs of the organization?	• Yes. As of 2004, the company implemented the "Public Safety & Reliability Index" to measure the overall state of the system (i.e. # of damages, locate errors), with the objective of performance improvement • This index is also reflected to the Corporate scorecard		4.3.5 Asset performance and condition targets
2202	5.e.2	Are the targets derived from and consistent with the asset management objectives?	Yes. The 2004 targets were based on a trend analysis that was carried out on data from the previous year. Data is reviewed quarterly by Engineering		
2203	5.e.3	Are the targets optimised to an appropriate level of detail?	Not yet… still in its 1st year		
2204	5.e.4	Are the targets specific, measurable, achievable, relevant and time-based (where practicable)?	Targets based on meeting some time commitment though not balanced with quality. EGD often only measures things that easy to measure.		
2209	5.f.1	Does the organization establish and maintain asset management plans for achieving its asset management strategy, objectives and targets?	Not quite. EGD does have a plan for certain assets such as cast iron , bare steel, cooper, reg. meters, high stress steel, but not for P.E. (polyethylene)		4.3.6 Asset management plan
2210	5.f.2	Does the organization's asset management plans include design, capital works, maintenance, decommissioning, availability of spares and work delivery plans?	Yes	Entire process not full optimized	
2211	5.f.3	Does the organisation optimise and then prioritise its AM plans?	Not yet.	This would be welcomed though	

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2214	5.f.6	Do the AM plans include documentation at relevant functions and levels of the organization?	Yes. The respective Engineering manuals		
2215	5.f.7	Do the AM plans include documentation of the means and time-scale by which asset management objectives and targets are to be achieved?	There are specific plans for specific initiative (i.e. HS steel, which only accounts for about 1% of system plant)		
2216	5.f.8	Does the organisation review it's AM plans periodically to ensure that they remain effective and consistent with the asset management strategy, objectives and targets?	Yes…on an annual basis.		
2217	5.f.9	Does the organisation, where necessary amend its AM plans accordingly?	Yes… this will be refined though		
2218	5.g.1	Does the organization establish and maintain information, in a suitable medium such as paper or electronic form, that: -	-	-	4.4.4 Documentation
2219	5.g.2	a) describes the core elements of the management system (processes) and their interaction?	Yes. This is in the process of being implemented by the new DMS framework. Process documentation has been isolated, but the intent is to document all significant plant related life cycles	DMS	See Roza Kohen for more information
2220	5.g.3	b) provides direction to related documentation.			
2221	5.h.1	Does the organization establish and maintain procedures for controlling all documents, data and information required by Clause 4 of this specification to ensure that:	Pipeline records are predominantly kept for the life the asset as part of the "Retention of Records Policy"	-	4.4.5 Document, data and information control (See Russ McLean for more information)

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2222	5.h.2	a) these documents, data and information can be located and accessed by authorized individuals?	• In terms of manuals, these are kept in both hardcopy and electronic format that are readily available to anyone who needs them. Unauthorized access is controlled • Access to plant data/records are readily accessible. Ability to affect change is controlled	Envision is in the process of converting all relevant plant data into electronic format, where only individuals with an appropriate level of access can make changes	
2223	5.h.3	b) these documents, data and information are periodically reviewed, revised as necessary, and approved for adequacy by authorized personnel?	• Manuals are reviewed annually, or as needed • Any changes made to records are tracked, including who changed what & when • In Planning, a Data Flow coordinator is employed to facilitate that recordss are disseminated accordingly		
2224	5.h.4	c) current versions of relevant documents, data and information are available at all locations where operations essential to the effective functioning of the asset management system are performed?	• Yes. • Locate contractors and Damage Prevention Inspectors now are using "Data Packs" - hand-held, portable electronic records. This may have applications for Operations as well		Data Packs are already being used and are planned to be rolled out to ahead of Field Force Technology
2225	5.h.5	d) obsolete documents, data and information are promptly removed from all points of issue and points of use, or otherwise assured against unintended use?	• For manuals, the process for replacing out-of-date versions is defined • Pipeline records are kept for the life the asset as part of the "Retention of Records Policy"		
2226	5.h.6	e) archival documents, data and information retained for legal or knowledge preservation purposes or both are suitably identified?	Yes. Old project files are achieved, and in certain cases stored offsite		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2227	5.h.7	f) these documents, data and information are secure and if in electronic form are adequately backed up and can be recovered?	Yes. EGD has an IT Disaster Recovery program in place to ensure electonic data is constantly backed up and recoverable		
2237	5.I.10	Does the organization plan and control these operations and activities in order to ensure that they are carried out under specified conditions?	EGD in diligent in ensuring that proper policies and procedures are excuted appropriatly, so that the conditions for undertaking work are safe		4.4.6 Operational control
2238	5.I.11	Does the organisation establish and maintain documented procedures to cover situations where the absence of these procedures could lead to failure to achieve the operations and activities listed in 5.75.1 to 5.75.8?	The DMS framework has controls in place, such that in the absence of these controls, there are a documented set of procedures that can be followed	DMS	
2239	5.I.12	Do these procedures include controls for the design, purchasing, construction, commissioning, operating, refurbishment, modifications and disposal of assets as appropriate.?	Yes. See Engineering's manuals and DMS framework	DMS	
2240	5.I.13	Does the organization ensure that the equipment and tools essential for achieving the required function(s) and performance from its assets or asset systems are maintained and calibrated.	Yes. Maintenance and calibration of equipment needed for asset maintenance falls under the responsibility of Fleet & Equipment group: done annually, or as needed		
2241	5.I.14	Where existing arrangements are revised, or new arrangements introduced, that could impact on asset management operations and activities, does the organization consider the associated risks before their implementation?	Assoicated risks are informally evaluated before undertaking any major decisions. The DMS framwork also evaluates risk in the absence of proper process controls; these are tied into Key Performance Indictators that are reflected in scorecards and compensation	DMS	
2242	5.I.15	Do the new or revised arrangements to be considered include: -	-	-	

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2243	5.I.16	a) revised organizational structure, roles or responsibilities?	Roles and responsibilities may need to be modified to accommodate DMS	DMS	
2244	5.I.17	b) revised asset management policy, strategy, objectives, targets or plans?	The DMS framework will more easily facilitatea revision of any asset management policy, strategy, objectives, targets…	DMS	
2245	5.I.18	c) revised processes and procedures?	Processes and procedures may need to be modified as needed	DMS	
2246	5.I.19	d) the introduction of new assets or technology?	This is always a considering when trying to optimize one's current operations	DMS	
2247	5.I.20	e) the introduction of new contractors, suppliers or personnel, as appropriate?	Personnel may need to be reallocated, or hired, to maintain the continuity of our system	DMS	
2248	5.j.1	Does the organization establish and maintain appropriate plans and procedures to identify the potential for, and responses to, incidents and emergency situations?	Yes. EGD has well defined procedures that are trained for, and implemented on, in emergencies: • Operations: Emergency Procedures Manual • Emergency Response Committee (Corporate level): Emergency Response Manual • IT Disaster Recovery program • Facilities Business Continuity plan • Business Resumption plan		4.4.7 Emergency preparedness and response (See Bill Bishop for more information)
2249	5.j.2	Does the organization's plans and procedures identify the potential for preventing and mitigating the likely consequences that can be associated with the emergency situation or incident?	Yes. EGD is diligent in ensuring potential problems are prevented. To mitigate potential consequences, refresher training is carried out, as well as other proactive initiatives to increase awareness for contractor excavators and the general public about the potential for causing damages to our assets (i.e "Call Before You Dig" program)		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2250	5.j.3	Does the organisations plans and procedures include information on the provision and maintenance of any identified equipment, facilities or services that can be required during incidents or emergency situations?	Yes. For example, EGD has "Mutual Aid Agreements" with other utility companies and contractors to provide needed manpower, and/or gas, in an emergency. This 3rd party relationship is reciprocal		
2251	5.j.4	Does the organization periodically review the effectiveness of its emergency preparedness and response plans and procedures, in particular after the occurrence of incidents or emergency situations?	• Planning group participates in weekly mock emergencies • Regionally, as well as at the corporate level, 'table-top' mock emergency drills are performed annually to test the effectiveness of procedures and for re-training/preparedness purposes • Post-mortem reviews are done following the occurance of incidents, and the subsequent issues (i.e. process, training, equipment, materials, etc.) are disseminated to the appropriate groups	there is not a rigourously enforced procedure to deal with the findings from QA non-conformances and and post-mortem reviews. EGD could do better to learn from all its data.	
2252	5.j.5	Does the organization periodically test these procedures where practicable?	Yes. Mock emergency test are carried out periodically		
2261	5.k.9	Do the organisations procedures require that all proposed corrective and preventive actions are reviewed through the risk assessment process prior to implementation?	No. Risk assessments are not readily done	We just do it	4.5.2 Asset-related failures, incidents, non-conformances and corrective and preventive action
2262	5.k.10	Is any corrective or preventive action taken to eliminate the causes of actual and potential non-conformances appropriate to the magnitude of the problems and commensurate with the asset management-related risk encountered?	This is done where appropriate, although the process may not be rigourously documented		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2263	5.k.11	Does the organization implement and record any changes in the documented procedures resulting from corrective and preventive action and shall include the required training where necessary?	Sometimes we do, sometimes we don't; Engineering doesn't always get informed		
2264	5.m.1	Does the organization establish and maintain procedures for the identification, maintenance and disposition of AM records?	Yes. See PDR Manual. (PDR - Planning, Design and Records Manual)		4.5.3 Records and record management (See Russ McLean for more information)
2265	5.m.2	These records shall include the results of audits and reviews.	Yes. In most cases, non-conformances and inadequacies in the records are rectified before the record is stored		It is often from the feedback of records end-users, that corrections come about
2266	5.m.3	Are the AM records legible, identifiable and traceable to the activities involved?	Yes. EGD has explicit guidelines on how records are created and sorted.		
2267	5.m.4	Are the AM records stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss?	Yes. Planning is in the on-going process of making all records available in electronic format, thus making the records easily transferrable, accessible and recoverable	EnVision	
2268	5.m.5	Are the retention times for the AM records established and recorded?	Plant-related records are kept for the entire life of the plant. When the plant is abandoned, the records are updated accordingly.		
2269	5.m.6	Are the AM records maintained, as appropriate to the asset management system (processes) and to the organization or to meet the legislative and regulatory needs, to demonstrate compliance with Clause 4 of this specification?	Yes. EGD's policy and procedures at least meet and, in most cases, surpass regulatory standards		
2273	5.n.4	Do the procedures provide for:	-	-	4.5.1 Performance and condition measurement and monitoring

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2274	5.n.5	a) both qualitative and quantitative measures, appropriate to the needs of the organization?	Yes, although there is always room for improvement		
2275	5.n.6	b) monitoring of the extent to which the organization's asset management policy, strategy, objectives and targets are met?	Somewhat, although no fully integrated		
2276	5.n.7	c) proactive measures of performance that monitor compliance with the asset management plans, operational control criteria and applicable legislation, regulatory, statutory, and other asset management requirements?	Somewhat, although no fully integrated		
2278	5.n.8	d) reactive measures of performance and/or condition to monitor asset-related deteriorations, failures, incidents, non-conformances (including near misses) and other historical evidence of deficient asset management system (processes) performance?	When it come to reactive matters, EGD is very responsible.		
2279	5.n.9	e) recording of data and results of monitoring and measurement sufficient to facilitate subsequent corrective and preventative action analysis?	Yes. Condition measurement (SCADA) and monitoring (Leak survey, corrosion) is done very diligently		
2280	5.n.10	If monitoring equipment is required for performance and/or condition measurement and monitoring, does the organization establish and maintain procedures for the calibration and maintenance of such equipment?	Yes. This is the responsibility of the operator and ultimately Fleet and Equipment		
2281	5.n.11	Does the organisation retain for sufficient time to comply with legislation and the organization's policy the records of calibration, maintenance activities and results?	Yes.		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2282	5.o.1	Does the organization establish and maintain an AM audit programme and establish procedures for periodic AM system (processes) audits to be carried out, in order to:	-	-	4.5.4 Audit (QA: See Harvey Morrison for more information)
2283	5.o.2	a) determine whether or not the asset management system (processes)?	-	-	
2284	5.o.3	1) conform(s) to planned arrangements for asset management including the requirements of the whole of Clause 4 of this specification?	• There is no audit programme yet to evaluate explicit compliance with the whole of Clause 4 • With respect to audits for Construction, O&M , and Planning & Design functions of EGD and contractors, the QA group conducts random samplings of specific units of work to ensure conformance to EGD's own policies and procedures	Yes.	QA: Quality Assessment
2285	5.o.4	2) has (have) been properly implemented and maintained?			
2286	5.o.5	3) is (are) effective in meeting the organization’s asset management policy, strategy and objectives?	For field personnel, their performance evaluations are tied into QA results (need a pass rate of 90%). With no policy explicitly relating to asset management, it can be inferred that compliance with EGD policies and procedures has the goal of meeting EGD's org. policies		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2287	5.o.6	b) review the results of previous audits and the actions taken to rectify non-conformances?	• For Operations: Results from previous audits are compiled for the regional managers semi-annually • For Operations: Non-conformances are forwarded to the offending individual's supervisor, whose responsibility its is to ensure that the infraction is discussed and rectified. In serious cases, the Quality Control group becomes involved, where QC provided mentoring and retraining to remedy the non-conformance • Internally, the Audit group performs audits of internal groups to evaluate their adherence to each groups stated roles and responsibilities		Unless QA non-conformances affect the safety/integrity of the plant, follow-up is the responsibility of the corresponding offenders supervisor, and in serious cases, escalated to Quality Control
2288	5.o.7	c) provide information on the results of audits to management?	QA audit results are available to anyone who wishes to view the data, and this data is also compiled and presented to regional managers semi-annually		
2289	5.o.8	Is the audit programme, including any schedule, based on the results of risk assessments of the organization's activities, and the results of previous audits?	No. For operations, work units are predominantly sampled equally. Although audits are not based on risk assessments, in 2006, work units will now carry a weighted rank (high, medium, low) that relate directly to certain values for demerit points, which ties in to personal scorecards, and subsequently compensation		
2290	5.o.9	Do the audit procedures cover the scope, frequency, methodologies and competencies, as well as the responsibilities and requirements for conducting audits and reporting results?	Yes. This is what the QA group does		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2291	5.o.10	Where possible, are the audits conducted by personnel independent of those having direct responsibility for the activity being examined?	Always. QA inspectors work centrally, as opposed to for regional managers, to avoid conflict of interest		
2294	5.p.3	Is this review documented? (Management review of AM Processes)	Yes. See DMS framework		4.6 Management review and continual improvement
2297	5.a.1	Are there management processes for cost/performance/risk evaluation or modelling of the following?	-	-	
2298	5.a.1.1	Renewal, upgrades and modification options	No. This type of evaluation has only been done with cast iron	Yes: CIRAS & IRAS	
2299	5.a.1.2	Changes to operating procedures			
2300	5.a.1.3	Changes to maintenance strategy and procedures			
2301	5.a.1.4	Contingency planning and spares strategy			
2302	5.a.1.5	Inspection intervals and condition assessment			
2303	5.a.1.6	Life cycle costs and residual life			
2304	5.a.1.7	Whole systems performance (reliability, availability, maintainability)			
2305	5.a.2	Have the following processes been formalised for Business, Operating and Maintenance Strategy development and review:	-	-	
2306	5.a.2.1	Functional Criticality, FMEA, Maintenance options	No, not formalized.		
2307	5.a.2.2	Performance- and condition-based maintenance and inspection intervals	No. Although we perform QA on improper maintenance procedures, "good" data collected is not appropriately utilised.		
2308	5.a.2.3	Shutdown/outage programmes and effectiveness	Emergency Response Manual, et.al		

Question Reference	Result Reference	Review Question	Evidence	Opportunity & Current Initiative:	Comments:
2309	5.a.3	Is there a formalised Cost Control and Financial Management process:	-	-	
2310	5.a.3.1	Financial management system	EFS (Oracle)		
2311	5.a.3.2	Standard costing, budgeting, reporting and cost control	Yes		
2312	5.a.3.3	Exception analysis and auditing	Yes		
2313	5.a.3.4	Zero based budgeting	Not sure		
2314	5.a.4	Is there a formalised Problem Solving & Root Cause Analysis process for:	-	-	
2315	5.a.4.1	Incident reporting system	Debriefing, RCA, Material Fault Program		
2316	5.a.4.2	Root Cause Analysis techniques and organisation	• Procedural: ESTS - Material Fault; EH&S • Contractor: QA, SDA	Yes. The current process is not explicitly defined. Informal	
2317	5.a.4.3	Productivity improvement programme			
2318	5.a.4.4	Value management programme	Yes. DMS	DMS	
2319	5.a.4.5	Continuous improvement	Yes. DMS	DMS	
2320	5.a.5	Is there a formalised Change Control System:			
2321	5.a.6	Is there a change control system including:			
2322	5.a.6.1	A document management system	Yes. DMS framework	Accountability issues	
2323	5.a.6.2	Storage and archiving	Yes. DMS framework		
2324	5.a.6.3	Authorisation and audit trail for changes	Yes. DMS framework		

APPENDIX 3 - Briefing Letter

Asset Management Interactive Assessment

Dear Colleague:

Last week, Jim Schultz, President, Enbridge Gas Distribution announced to senior managers that we are embarking on an assessment to help us better understand leading asset management practices and evaluate opportunities to adopt some of these practices within our company. I am writing this memo to request your participation in this upcoming assessment.

Starting July 11, we will be collecting employee input on the effectiveness of our processes and activities that directly or indirectly support the management of our physical assets, and exploring where there may be opportunities for improvement. To assist us in this endeavor, we have secured the services of The Woodhouse Partnership, a company based in the United Kingdom with global expertise in the area of physical asset management.

Keith Rimmer and Peter Jay of The Woodhouse Partnership will be gathering input through a series of one-on-one meetings and focus group sessions with employees from across the organization. Close to 100 employees have been selected to participate in these sessions, based on the role they play in managing the company's distribution assets. As one of those selected, you will be receiving a meeting invitation soon. I encourage you to share your ideas and concerns candidly with Keith and Peter to ensure the exchange is as meaningful as possible. Your discussion will be maintained in strictest confidence.

Our physical assets have long life expectancies and it is critical that the decisions we make on how to design, operate and maintain these assets ensure their safety, reliability and longevity for both today's and tomorrow's customers. Your input and expertise will be instrumental in this process.

I thank you for your participation and look forward to sharing the results of the assessment with you in the fall. If you have any questions or concerns in the meantime, contact Carolyn Teehan at 416-753-6972 or carolyn.teehan@enbridge.com.

Sincerely,

Glenn Beaumont, P.Eng.

Vice President, Engineering

Enbridge Gas Distribution

APPENDIX 3 Summary of Focus Group Feedback

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.2.1	Asset Management Policy		
4.2.2	Asset Management Strategy	• Micro management of fieldwork	• *Efficiency appears to be greatest where planners are co-located with delivery teams, and where some flexibility is allowed for field staff and supervisors to control their own work. Some re-evaluation of the long term strategy may be appropriate.*
4.3.1	Asset Information System	• Lost productivity due to administering new IT systems. • Make the work management systems and budget systems work together. • Review processes and align the IT systems with what needs to be done to manage the system efficiently – being driven by what the IT requires. • EnVision impact on strategic alliance commercial interface has been a major problem – invoices very late, and asset information late and inaccurate. Revenue being lost due to late entry into billing system. Using estimated information for payment pending reconciliation – additional administrative overhead to manage system. • Computers in vans – coding work takes too long, resulting in wasted administration time for front line staff and disputes about service quality (time to site). • Benefits claimed as a result of efficiency are not considered credible.	• *There is already major effort within Enbridge to get the EnVision project back on course. The issues identified here are some of the more serious current issues. There is a need to ensure that the IT system once stable and in place will be suitably aligned to the process requirements of EGD and their contractors. There are a number of issues raised elsewhere (such as records) which are closely related. One of the most significant common issues is the time/resource it currently takes to enter information into the systems, and inaccuracies arising from this part of the process. Significant simplification should be possible.* • *Benefits associated with improved asset knowledge should be considered*
4.3.2	Risk Identification Assessment and Control	• Better recording and monitoring of leaks – pro-active rather than reactive approach. • Lack of understanding behind the derivation of some test procedures, and inconsistency.	• Enbridge is proactively monitoring integrity and using the information for planning replacement strategy. • *There are opportunities for reviewing and optimising the inspection regimes.*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.3.3	Legal, Regulatory, Statutory	• Accountability – Enbridge requiring all safety related issues to be reported via them, but TSSA require direct notification. Has this safety liability driven some QA checking now required by Enbridge?	• *Clear and consistent policy required. The current situation is 'safe' but may result in delays or confusion in reporting, and may be inefficient.*
4.3.4	Asset Management Objectives	• Cost is a major focus – some concerns that the customer is losing out.	• Enbridge culture has always supported care and concern for the customer. *The issue may be addressed by appropriate communication and reinforcement by management.*
4.3.5	Asset Performance and Condition Targets	• Inadequate financial and productivity reporting, and little confidence in data. This is a major concern to managers – they are effectively 'flying blind' • Some scorecard measures are resulting in focus on individual gain, people fulfilling others objectives and inappropriate priority.	• *Appropriate monitoring and feedback is a priority.* • *Overall the scorecard system is seen as good and successful, but at technician and SDA level there are opportunities for improvement.* • *Asset related (rather than financial) indicators are infrequent.* • The Public Safety and Reliability Index is a good example of an asset based relevant set of performance measures. *The scope could be extended to cover more assets and processes.*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.3.6	Asset Management Plans (Including planning process)	• Lost productivity waiting for 'dependencies' – welder, backhoe etc. • The complexity of planning work through the IT system is resulting in increased administration overheads and in practice many are working around it. Planning work is being administered by clerical staff and needs to be very accurately defined, it also takes a long time to enter work. The clerks are under stress and do not have sufficient technical knowledge to avoid errors. • Lack of forecasting capability at present from the work management system. • Centralised resource planning is not working out. • Information flows – informing the contractor in advance that work is coming up to enable him to more efficiently meet appointment times. • The construction contractors preferred way of matching work to skills is to match the crew to the work, whereas the scheduling process being rolled out assumes a fixed crew and tries to match the work to the crew.	• *A review of the processes which align dependencies, pre-inspections and locates would seem appropriate.* • Field staff are still well motivated and trying to deliver a good job
4.4.1	Structure Authority and Responsibility (includes processes)	• Accountability and responsibility in planning work is becoming blurred. 'Supervisors not being allowed to supervise'. • Pre-inspection is contentious – the quality and timeliness seems to be suffering. Technicians would like to do their own; supervisors would like to have time to do it (frustrated by being diverted to initiatives & meetings). • Multi-disciplined technicians are frustrated that the workload for Enbridge staff flexes around keeping the agreed level of work with contractors.	• *'Assignment of work by planning is fine but day-to-day running of the job should remain in the field'. This could be a focus for constructive discussion.*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.4.2	Training Awareness and Competence	• Technicians feel that they need some more (and appropriate) training on using the work management system. • High proportion of skilled staff due to leave – inadequate succession plan. High turnover of young supervisors and managers moving on results in reliance on experienced technicians in some disciplines. There is a skill gap in some areas – e.g. welding. In some areas skilled staff are having to cover multiple skills, and there are severe resource limitations. The reduction in 'training posts' such as 'welders helper' mean that appropriately trained staff are not coming through. • Training budgets cut as OPEX becomes tighter. • SDAs concerned that they lose staff to Enbridge once they are trained – Enbridge now not training gas fitters. • Field trainers are reputed to be stretched and not able to meet commitments.	• There is a deliberate circulation of staff through Engineering and Operations which promotes good long term working relations • *Need a consolidated and consistent approach to training. This will require planning and commitment.; resources and budget.* • *There is opportunity to work with SDAs and agree a joint training programme or training service.*
4.4.3	Consultation and Communication	• Frustration that feedback from the field does not seem to have been taken on board – e.g. EnVision, process maps. • Communication is not working well – company policy, direction etc. • Contractors would welcome more open communications, and better forecasting information. • Frustration in some quarters that progress appears to be resisted by union pressure.	• Engineering and Operations consult and pool knowledge • Good long term history of working with unions • *Scope to consider the communications strategy to join up the organisation through the line management route– e.g. team briefs etc.* • *Opportunity to feedback results of the input people have made to business improvement (including this review)*
4.4.4	Documentation	• Complexity of and quantity of paperwork.	• *Procedures could be tidied up and simplified. SDAs would like to be able to have constructive input to this.*

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.4.5	Document, Data and Information Control	• Not clear how some information now collected is to be used, but it is time consuming to input it. Reports not seen as useful for driving the business. Some information needs to be collected at source – trying to put it on later using clerks results in errors. • Scorecards used with SDAs – problems with data quality, associated with data entry issues and the current work management process not aligning well with the IT. • Data is being lost from some legacy systems – not compatible with the replacement Envision system	• Technology changes have speeded up access to documents and records. • *Identify information requirements (including quality) to support the business decisions and processes.* • *Clear accountabilities for data and links to processes should result in reducing the volume of data and improving the quality.* • *It may be appropriate to transfer some legacy data if it can be justified by the business – this tends to be associated with asset management data rather than work management data.*
4.4.6	Operational Control	• Control of the work shifting from the front line & supervisors to the scheduler • Very little forward notice of upcoming work – continually in 'reactive' mode – loss of empowerment to field staff. Managers and supervisors feel removed from the planning and believe that the field staff should be better utilised. • Too much time spent in meetings	• *Clarify accountability – if schedulers are picking up responsibility for controlling work delivery this could be reflected in accountability.*
4.4.7	Emergency Preparedness and Response	•	•
4.5.1	Performance and Condition Measurement & Monitoring	• QA is contentious. Between Enbridge and SDAs each claims the other side are not adding as they have better technical knowledge. Enbridge technicians believe that there is excessive in house QA. There appears to be overlapping and inconsistency of quality checking. • Quality of work is suffering as a result of workload in some areas	• *This may be an opportunity for review and alignment of QA – this may result in a reduction of work volume where QA is not appropriate.*
4.5.2	Asset Related Failures, Incidents, Non-conformances and Corrective actions	• Call centre performance concerned some representatives – Enbridge's reputation at stake if information and service is not adequate.	•

Section	PAS 55 Heading	Issue	Good Practice Examples/*Opportunities*
4.5.3	Records and Record Management	• Inaccurate records – current loss of accuracy, complexity of updating records, backlog, loss of data from legacy systems.	•
4.5.4	Audit	• The SDA contractors would prefer a more trusting relationship on quality – in house staff view is that they would prefer to increase the level of quality checks.	• *Align QA requirements*
4.6	Management Review and Continual Improvement	• Too many initiatives going on - focused on a limited number of staff • Change takes a long time to happen, too many people are involved and people don't want to make a decision.	• *Improved and aligned project/programme management. Opportunity to put some structure around initiatives and align them with a common goal. A programme of projects will enable priorities and phasing to be agreed, backed by a resource plan and a 'project board'. Milestones and deliverables should be aligned.* • *A reassignment of representatives to balance it out would be useful. There are examples where senior managers are trying to do this, but this is exceptional and some individuals are overburdened.*

APPENDIX 4 Questionnaire Database Analysis

Detailed tables in this section show the responses to questions grouped by PAS 55 section titles, except where only a single question is used, results are also shown graphically:

Key:
The score is a number calculated for each question between 20 (innocence) and 100 (excellence). All questions have been given the same weighting. The score is based on the following scale:
20 – Innocence
40 – Awareness
60 – Understanding
80 – Competence
100 - Excellence
Count of score – number of interviewee responses. A low number here obviously indicates a small sample and the inherent risk of error.
Standard deviation of score – The standard deviation of the scores. This provides some indication of the scatter of results, where the standard deviation is high, this indicates a wide scatter of results, often a good indicator that there are examples of both good and bad practice occurring, or disparity between perceptions at different levels in the company.
Max of Score – Maximum individual interviewee score
Min of Score – Minimum individual interviewee score
Average of Score – average interviewee score

Questionnaire Summary Results

It should be recognised that these contain the sum of questions asked of interviewees against each section – hence a count of score of 3 for legal, actually represents 3 questions asked of one individual.

PAS Ref	PAS 55 section	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
4.1	General Requirements Total	27	20	100	40	70.37
4.2	AM Policy and Strategy (General)	42	16	100	20	59.05
4.2.1	AM Policy	38	19	100	20	66.32
4.2.2	AM Strategy	34	22	100	20	51.76
4.3	AM Information, Risk Assessment & Planning	56	16	100	20	63.57
4.3.1	AM Information Systems	75	20	100	20	58.40
4.3.2	Risk identification, assessment and control	22	20	100	20	56.36
4.3.3	Legal, Regulatory & Statutory	3	0	100	100	100.00
4.3.4	AM Objectives	10	27	100	20	54.00
4.3.5	Asset performance and condition targets	56	17	100	20	75.00
4.3.6	AM Plans	27	22	100	20	48.89
4.4	Implementation & Operation (general)	1		80	80	80.00
4.4.1	Structure, authority and responsibilities for AM	47	21	100	20	62.55
4.4.2	Training Awareness & Competence	36	20	100	20	34.44
4.4.3	Consultation and communication	4	34	100	20	65.00
4.4.4	Documentation	5	22	100	40	64.00
4.4.6	Operational control	15	13	80	40	62.67
4.5	Checking & Corrective Action	11	24	100	40	74.55
4.5.1	Performance and condition monitoring	7	22	100	40	54.29
4.5.2	Failures, incidents and responses	4	20	100	60	90.00
4.6	Management Review & Continual Improvement	33	16	100	40	61.82

The following graph shows the summary results in order based on average scores. This is indicative only, but does suggest that the following are areas where there could be opportunities:-

- Training, including succession management.
- Planning.
- AM Strategy including processes.
- AM objectives
- Performance and condition monitoring.

The story is more complex than this, however, and further investigation reveals that there are wide variations between responses in areas that have an average overall score – such as

risk management, where there are pockets of best practice but opportunities to extend this across the business. Results are inevitably skewed by ongoing issues with managing EnVision, which is one of the factors contributing to the current low score on planning. The error bars indicate the maximum and minimum scores recorded.

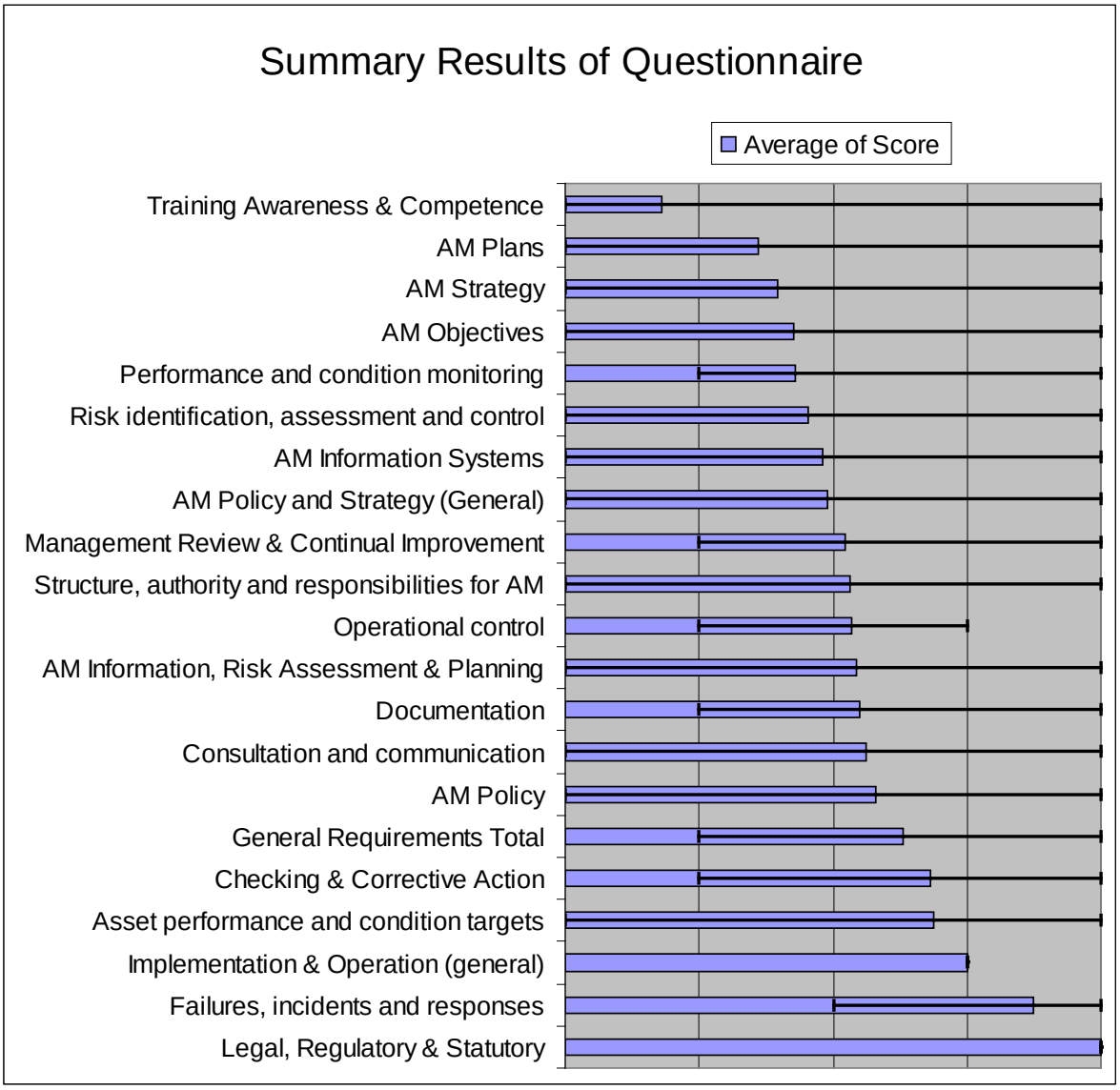


Fig 11

Identified Issues – Low scores (risks)

The following table has extracted recorded opportunities where the interviewee has given the issue a score of 20 (innocence) or 40 (awareness).

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
AM Information Systems	**4.3.1**				
		How accurate is the information you receive?			
			Rumoured not good. AM information is not well coordinated and aligned - not yet on GIS, needs double entry	Quality assurance - should be able to know where we are at. Asset condition information an issue	20
			need improved forecasting - purchasing. Operation perspective not good. Reputation issue	maybe - not big driver financially	40
			As good as it went in - some don't trust it. Excuse for not using it. Don't trust nos.	Culture/coms/training. Develop new skills etc.	40
		How does the IS meet your requirements - is it relevant?			
			IS meets requirement - people don't understand it . Need some training. Want someone else to do reporting/analysis for them	Training should be possible	40
				alignment could be improved	40
			not too good - better before - in changeover phase	need to complete the job	40
			difficult to get accuracy - too easy to make errors.	need Envision to deliver	40
			Envision is not helping us - struggling	sort out Envision - align it with needs	40
		How is information and knowledge managed			
			Good on finance system. Operations systems currently lack understanding/training. Process needs sorting	Need to sort process and improve understanding/training	40
			We are looking at workforce - knowledge - cast iron replacement is accelerated as the skills are disappearing - own team - needs to expose them - not consistency - use to have development opportunities.	Pockets of understanding	40
AM Information, Risk Assessment & Planning	**4.3**				
		How is risk identified, assessed and controlled?			
				RA of StP - tools & Tech	40

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
			Top level risk register in place - wider use of risk assessment needs developing. Some inconsistencies	Should be in business case. Quantified risk assessment using financial and probability	40
			No formal risk assessment process -	collect condition data	40
	4.3.6				
		How are whole Life Asset Management plans put together - what is your/department role?			
				Opportunity for change	20
			Department will do reporting and define a process (finance). Assist with business plans - potentially key player.	needs developing - process and rigor	40
		How do you prioritize work and resource plans?			
			Weekly change management process. Based on engineering judgment - FACILITIES. May not need a better system here!	Develop pro-active approach. Currently reactive	40
		How is long term planning co-coordinated with short term plans and schedules?			
AM Plans			Comes through on annual basis - can't see long term	Not really scheduling to balance resource workload across years	40
		What can you tell me about the delivery of your AM plans (renewals, planned maintenance, inspection) - are they cost efficient and cost effective?			
				improve information - Envision deliverable	20
			don't collect info	collect analyze benchmark	20
			info not yet available but coming. Maybe in construction. Restoration cost maybe 2yrs away.	opportunity. Repair delay	40
			Not aware	Improve visibility - opportunity for Envision	40
			Not known - maybe not a priority at this point. Costings not brought back in detail to Oracle for O&M projects	Review in light of overall AM strategy	40
			'Does it matter' - provided approved no incentive.	Future opportunity moving towards incentivised regulation.	40
			not there	need to develop and be able to measure	40
AM Policy and Strategy	**4.2**				

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
		Knowledge management - how does it effect you?			
			half staff less than 5 years experience. No structured training.	Training programme needed. Apprentice training - manage liabilities	40
		What can you tell me about the company's Asset Management Policy?			
			just getting under way some good pockets - good work in mains assessment	opportunity to improve documentation of policy and put it in place consistently	20
				opportunity	40
			manuals but not linked to strategy. Some HR plans - looking at retirement.	extend to strategic	40
Asset Management Objectives	**4.3.4**				
		What do your objectives say about your AM individual obligations?			
			Not specifically mentioned - may not be necessary?	Require supporting AM information to support budget requirements - enforcement - asset health statement	20
			Not really there - not into predictive - reactive	Better definition needed	40
			Not cascaded outside engineering	opportunity	40
Asset Management Policy	**4.2.1**				
		In what way do top management endorse the AM Policy?			
			VP strongly endorsed. Expecting other top team to endorse	once plan starts moving - higher awareness	40
		Who sets the production/ operations policy - what is your/departments role?			
			don't use risk info	use risk info	40
Asset Management Strategy	**4.2.2**				
		How do inspection intervals get reviewed or revised?			
			set by historic practice.	opportunity	20
			Sometimes get revised based on judgment. Not a formal process FACILITIES	Formalize process	40
		How is the lifecycle of the asset built into the AM Strategy?			

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
			Only targeted caste iron	big opportunity to understand	20
			replacement program - no formal process - ops provide some recommendations based on locally generated checklist. Inconsistent. Planning drive for development - assessment of capacity is based on 'gut feel'	Good opportunity for better modeling and joined up process. Consistent process required. Field validation of volume capacity would save big money	20
				opportunity	20
			not in place	needs developing - opportunity for better modeling	40
		Intrusive and non-intrusive Inspection, what is the company's strategy - what is your/departmental role?			
			do what the regulator asks	need modeling	40
		Is there a condition-based maintenance program			
				opportunity	40
			inspection programs & policies - based on historic interval 'best practice'	opportunity for improvement - but no more	40
Asset performance and condition targets	**4.3.5**				
		How are KPIs used/reviewed			
			reactive measures - scorecard for department. No ability to influence measures, just report. Lot of effort to collect data - no value	Asset measures need to get smarter. Good on financials	40
		What can you tell about how your AM targets are reviewed?			
			not well defined, not reviewed formally	opportunity	40
Checking & Corrective Action	**4.5**				
		How is change controlled and audited - what is your/departments involvement?			
			Policy - TA technical announcements - will be made - each Team Leader responsible - for there - Engineering will update any changes - in eng - policy & procedures - under consideration - audits	Ownership -	40
			Not too good	Opportunity to improve	40
			Match QA requirements against military specifications. Used to support KPIs and target improvement. DMS being rolled out.	Process is progressing, but not entirely yet in place.	40
Consultation	**4.4.3**				

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
and communication		*What AM information do you receive and is it timely and relevant?*			
				opportunity to identify and collect	20
Documentation	**4.4.4**				
		How is the AM Policy documented, implemented and maintained?			
			policy not well defined - inconsistently.	needs some structure and consistency	40
General Requirements	**4.1**				
		What is your definition of an asset			
			awareness but not cultural understanding	communication	40
Management Review & Continual Improvement	**4.6**				
		Do existing reporting adequately support management review of asset management processes?			
			Capacity there - may need informed and focused. Data there - not exploiting	smarten up getting right data visible	40
			reporting is not part of the normal job - by exception	could improve - regular review, analysis	40
Operational control	**4.4.6**				
		How are AM processes defined and communicated to ensure that AM strategy is achieved?			
			Communication is not happening well. The picture is not joined together clearly - 'no big picture'	Clear vision and improved communication	40
Performance and condition monitoring	**4.5.1**				
		Can you tell me the procedures you use to measure the performance and condition of the asset?			
			Reactive	can improve	40
		What measures do you use to monitor the performance of the Asset			
			Some minor reporting. Reactive	opportunity - feedback from field staff	40
Risk	**4.3.2**				

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
identification, assessment and control		*How are the results of the Risk Assessment built into the determination of requirements for the monitoring, maintenance, refurbishment, replacement, decommissioning and disposal of assets?*			
				opportunity	40
		How are the results of the Risk Assessment built into the development of AM plans?			
			not joined up to AM policy - good on caste iron	need to join up risk management with other decisions and policy	20
			In some areas - e.g caste iron & cu services other areas nothing	could usefully extend modeling to other assets	40
		How are the results of the Risk Assessment built into the development of operational controls?			
			not done	opportunity	20
		How are the results of the Risk Assessment built into the identification of adequate resources including staffing levels?			
			Happens by reaction	Not systematically addressed	40
Structure, authority and responsibilities for AM	**4.4.1**				
		How do top management consider the adverse impact that the asset management policy, strategy, objectives, targets, plans, etc. might have on other aspects of the organization?			
			Not talking about cross organizational effects	Communication and discussion to understand issues	40
			Not sufficiently, widely understood. Need to recognize it is all part of same story	Communication	40

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
		How do top management conversely, consider whether plans generated from other parts of the organization might have an adverse affect on asset management?			
			not great - processes and business not joined up	align processes - avoid overlaps - accountabilities need to be clear	40
			EMT meet to review regularly - weekly. Common link - not visible at lower organization levels	Develop appropriate cross connection at lower business levels	40
			not adequately considered - strategic discussion	Make it a wider strategic review process - align initiatives and direction	40
		How do top management ensure that adequate resource is available to ensure effective Asset Management?			
			Not there - same group for all initiatives. Don't bring people back in to organization well	Top level commitment - succession plan	40
		How do top management show their commitment to the development and implementation of an AM system and to continually improving its effectiveness?			
			So far haven't really seen it. Only tell a few	Better communication -	40
				communication - clear message	40
				assessment exercise	40
	3				
		What is your understanding or definition of Asset Management?			
			the long term management is missing	opportunity	40
Terms and Definitions			collection of processes to maximize investment in assets - knowing when to maintain etc. manage safety	Know what best companies do - keen to learn. Still need to demonstrate what is right for Enbridge.	40
				Need a clear simple message	40
			through data feedback - condition driven decisions	opportunity for condition based maintenance regime/criticality	40
Training Awareness & Competence	**4.4.2**				

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
		What training is there for staff in AM tools and techniques?			
			some training but a big issue for developing staff.	Formalized practical targeted training needed	40
		Who receives Cost/risk/performance analysis and optimization training?			
			not currently formally addressed - some local knowledge	training and consistent use of approach	20
		Who receives Life Cycle Costing training?			
			not generally done	Training and consistent use of methods	20
		Who receives Risk Management training?			
			At high level - myself and DR's - safety awareness of hazards - fault tree analysis at the top.	New equipment assessments not covered	40

Identified Issues – High Scores (Opportunities)

The following table has extracted recorded opportunities where the interviewee has given the issue a score of 80 (competence) or 100 (excellence).

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
	4.3.1				
		How accurate is the information you receive?			
			Pretty good records - some inaccuracy but expecting better accuracy	Developing towards field force solution	80
			maintenance program auto generated - asset info is good. Check frequencies and jobs - not yet sure if that is OK	check some data accuracy	80
				some info interface issues - gaps -	100
		How does the IS meet your requirements - is it relevant?			
			Single system AM - big move forward. Capture errors - follow up to improve. Get info faster via field force technology. Eng policy - uses business rules to create work program. Accuracy not where it needs to be.	Got the tools now need to use them. Training and communication.	80
AM Information Systems			Struggling with Envision - will do the job eventually	Focus on work management - not good at supporting asset decisions yet	80
			Working well for risk assessment - supporting the process. Not able to provide overview of asset condition for all asset areas	Asset information and decision support needs to link to Envision	80
			in progress to improve. Good information to support finance requirements	no of potential customers …	80
				ENMAR	100
		How is information and knowledge managed			
				Comm & Awareness for excel	80
		What can you tell me about your information management system			
			or billing data - large volume	decision making tools	80
AM Information, Risk	**4.3**				

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
Assessment & Planning		*How is risk identified, assessed and controlled?*			
			individual risk assessment. Using financial info - collecting data - now possible. Leak data collected for caste iron for 25 years.	use information being collected - training. Envision will collect better data as part of normal work on assets - and caught old history.	80
				consistency	80
			working on improvement. Steel mains - impact evaluation IRAS. Serious safety risk - categorized - dealt with at appropriate level. Lower risk items known	further work ongoing	80
		Who was involved in its development			
			Down to local level. More recently has been top down.	develop AM prioritization to support risk management	80
AM Policy and Strategy	**4.2**				
		How have you involved others in the development of the company's policies and strategies?			
			high degree of benchmarking - orientation	consistent - pull across best practice across business	80
		Knowledge management - how does it effect you?			
			knowledge currently good - succession planning may be an issue.	attract people in and keep them - compensation package could be reviewed	100
		Legislative and regulatory compliance - how does it effect you?			
			Driven by regulatory compliance	maybe cost/risk/performance future opportunity	80
		Partnerships - How are projects evaluated and prioritized for cost/risk/performance?			
			strict process - NPV and IRR financial basis. Strong at approval process	Introduce post investment and learning - was prediction correct	80
		What can you tell me about your objectives?			

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
			Have strategic objectives in place. Run groups as if independent businesses. Central policy - like to 'play within that box' - business opportunities to gain.	Start looking at business opportunities beyond current perspective.	80
Asset Management Strategy	**4.2**				
		How is Maintenance and Renewal strategy managed - what is your/departmental role?			
				renewal	80
Asset Performance and Condition	**4.3.5**				
		How are KPIs used/reviewed			
			KPIs not as meaningful as they should be. Monitoring against risk mitigation.	Could be more meaningful	80
			Fairly sophisticated KPIs - 5/6 years cascading KPIs driven by objectives. Linked horizontally.	Longer term strategy - leading indicators.	80
			KPIs through scorecard - very structured & focused. People held accountable, assigned & incentivised. Visible to everyone.	Link it to strategy	80
			targets and where we are at monthly. Monitor status	predictive indicators	80
			Reactiive	look at proactive options	80
			Good scorecard/KPIs - tend to be on financials/customers - output driven. Lagging indicators	Develop leading incidents - asset performance	80
			check to see one for this year - - productivity repots not yet there	field worker	80
			Public safety and reliability index - good indicator. Early days of rollout - highly visible and well thought through measures and scores.	spread indicator practice to other areas	100
		What are the company's key performance indicators			
			REPORTING	Pockets of excellence	80
Checking & Corrective	**4.5**				

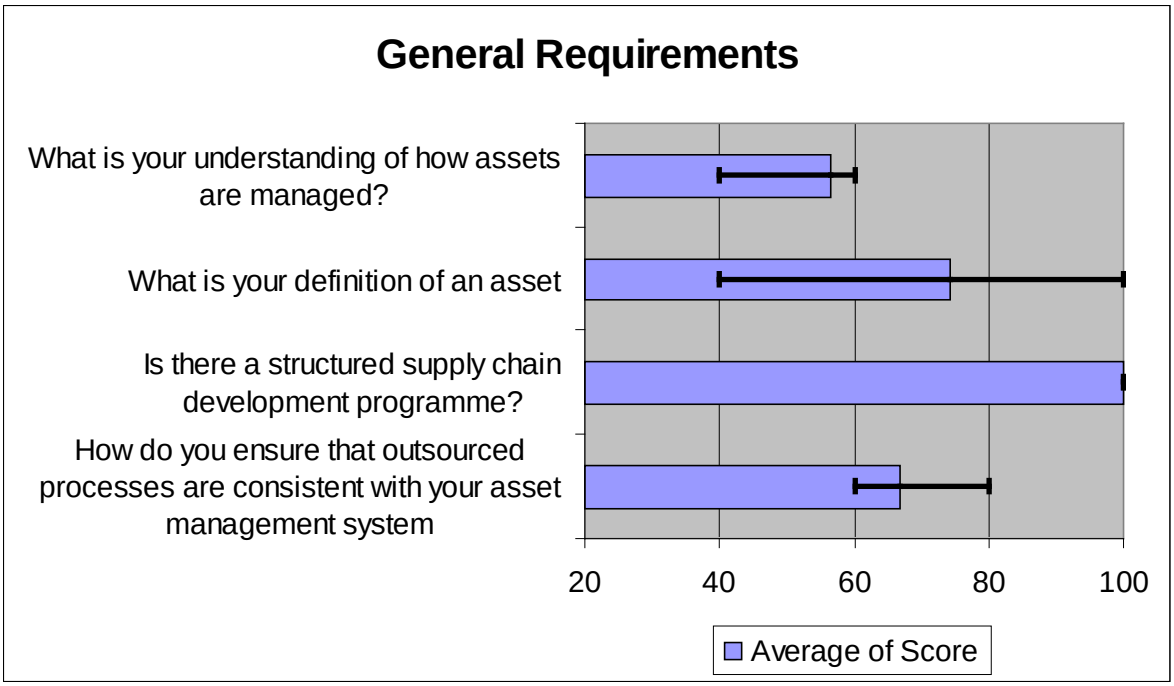
PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
Action		*How is change controlled and audited - what is your/departments involvement?*			
			Feedback from field triggers change process. Engineering also drive change - involve ops	speed of change could be better. Look at new technology	80
				Envision	80
				Field vision	80
			change control eng documentation	moving to highly responsive via Envision	100
Consultation and communication	**4.4.3**				
		What AM information do you receive and is it timely and relevant?			
			records/project progress. Very good	some processes could be streamlines	100
General Requirements	**4.1**				
		What is your definition of an asset			
			physical assets - not really thinking of IP	some education - low priority	80
			mostly talk about physical assets - don't quantify other issues.	data as an asset. Identifying appropriate owner. Identify useless data	80
			hard asset or contract - anything that can help you sustain your business. Physical or contract	Envision - focus. Contact management & physical AM. Optimize resource.	100
Management Review & Continual Improvement	**4.6**				
		What continuous improvement activities are you involved in, and what changes have resulted from it?			
			too many initiatives	alignment - PAS 55	80
			Continuous improvement happens and is encouraged. Linking to KPIs may stifle if formally promoted.	May help to have some structure to encourage continuous improvement	80
Risk identification, assessment and control	**4.3.2**				
		How are the results of the Risk Assessment built into the development of AM plans?			
			Caste iron - has been used. If identified as risk - certainly get remedial action planned	Need better consistency to ensure all risks treated with the same approach.	80

PAS 55 section	PAS 55 reference	Question	Answer	Opportunities	Score
Structure, authority and responsibilities for AM	**4.4.1**				
		How do top management conversely, consider whether plans generated from other parts of the organization might have an adverse affect on asset management?			
			Senior level - balancing - frustrating at the field level	communication - field level	80
		How do top management show their commitment to the development and implementation of an AM system and to continually improving its effectiveness?			
			Very good sign on at top level - waiting to find out what it means	Need to make a good case	80

Tables of Results and Graphs

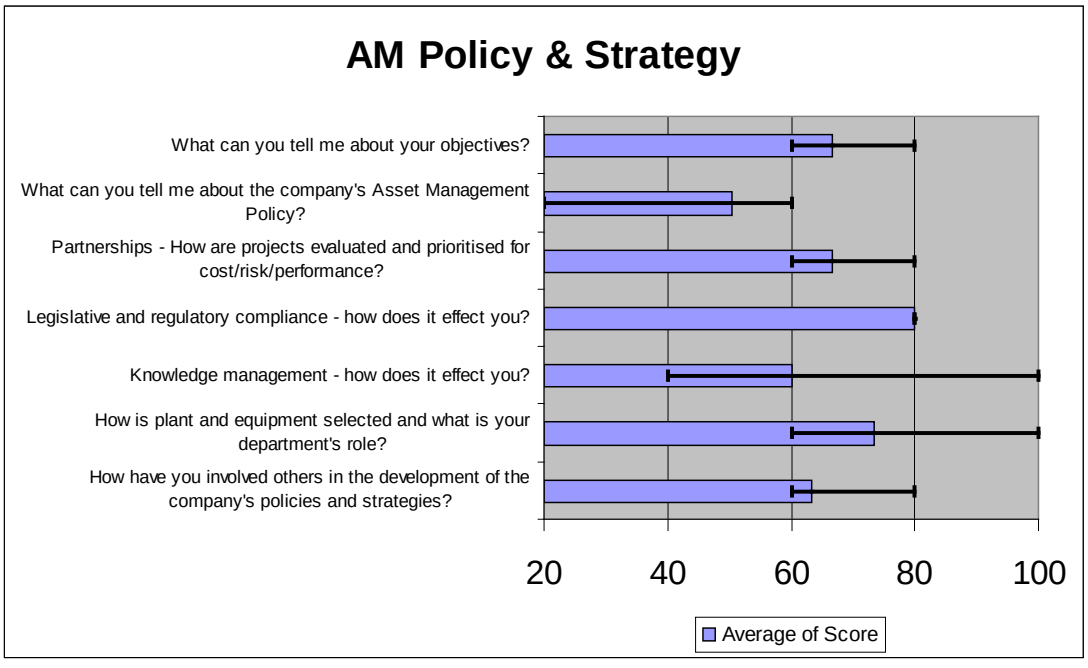
PAS 55 reference:	4.1

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
General Requirements	How do you ensure that outsourced processes are consistent with your asset management system	3	12	80	60	66.67
	Is there a structured supply chain development programme?	1		100	100	100.00
	What is your definition of an asset	17	21	100	40	74.12
	What is your understanding of how assets are managed?	6	8	60	40	56.67
General Requirements Total		27	20	100	40	70.37



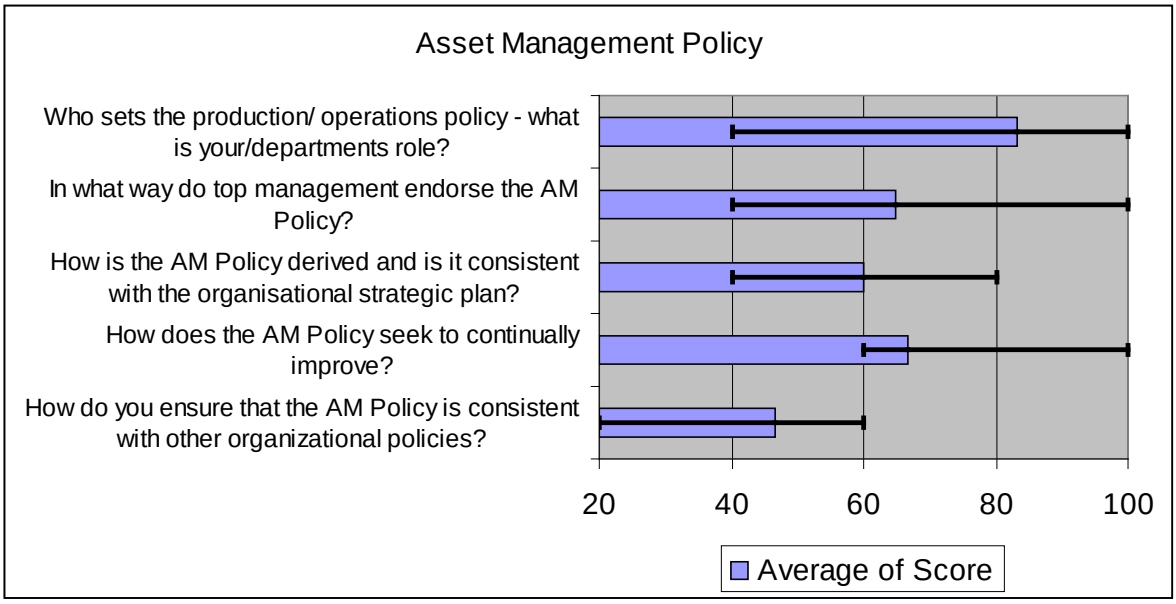
PAS 55 reference:	4.2

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
AM Policy and Strategy	How have you involved others in the development of the company's policies and strategies?	6	8	80	60	63.33
	How is plant and equipment selected and what is your department's role?	3	23	100	60	73.33
	Knowledge management - how does it effect you?	4	28	100	40	60.00
	Legislative and regulatory compliance - how does it effect you?	1		80	80	80.00
	Partnerships - How are projects evaluated and prioritised for cost/risk/performance?	3	12	80	60	66.67
	What can you tell me about the company's Asset Management Policy?	19	12	60	20	50.53
	What can you tell me about your objectives?	6	10	80	60	66.67
AM Policy and Strategy Total		42	16	100	20	59.05



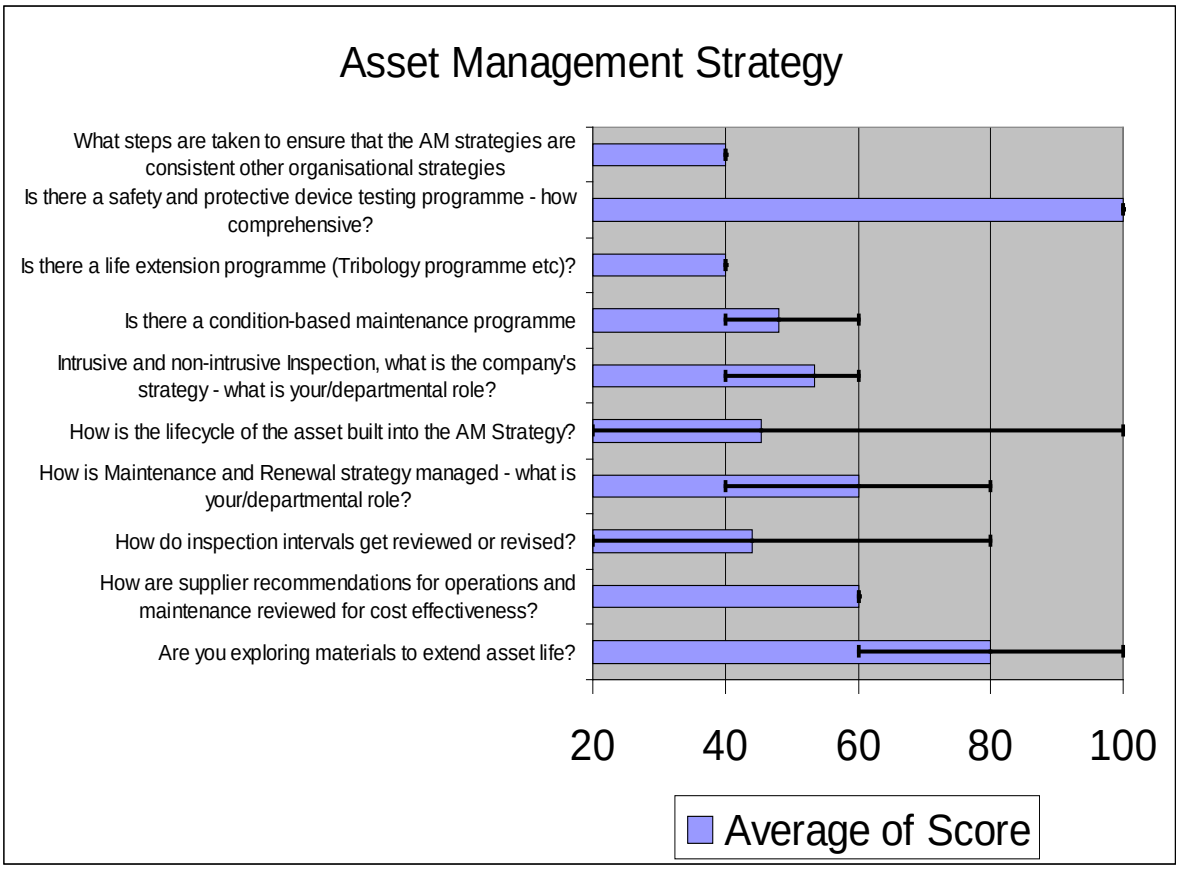
PAS 55 reference:	4.2.1

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Asset Management Policy	How do you ensure that the AM Policy is consistent with other organizational policies?	3	23	60	20	46.67
	How does the AM Policy seek to continually improve?	9	14	100	60	66.67
	How is the AM Policy derived and is it consistent with the organisational strategic plan?	3	20	80	40	60.00
	In what way do top management endorse the AM Policy?	17	15	100	40	64.71
	Who sets the production/ operations policy - what is your/departments role?	6	27	100	40	83.33
Grand Total		38	19	100	20	66.32



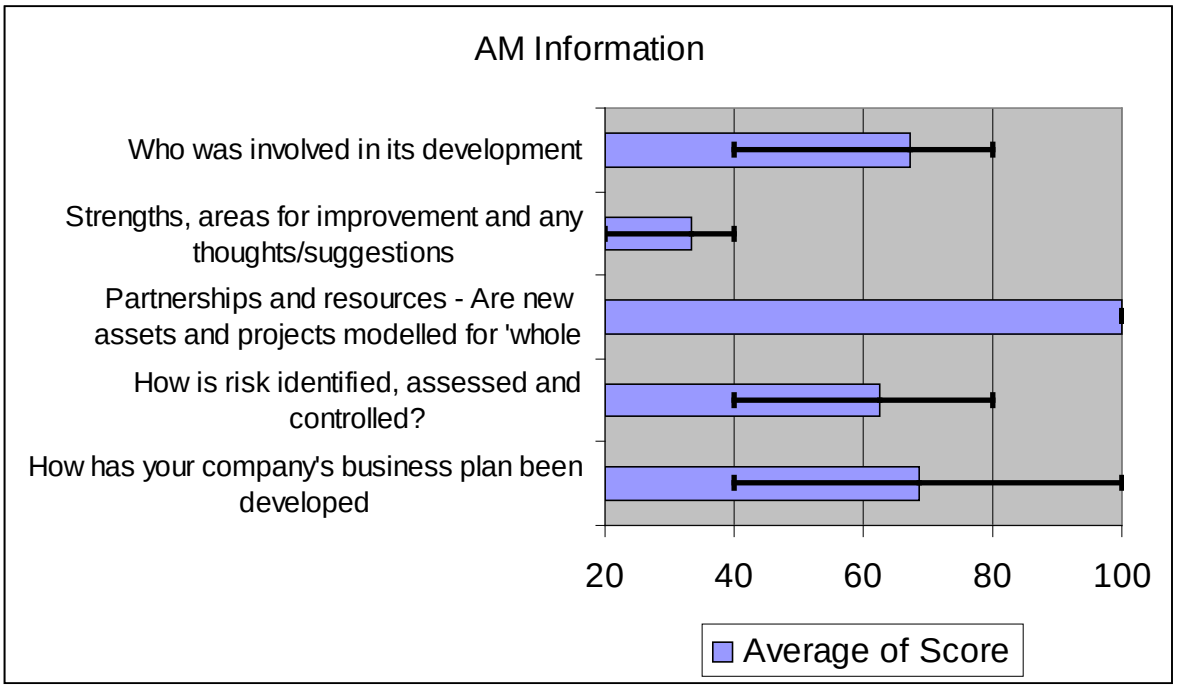
PAS 55 reference:	4.2.2

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Asset Management Strategy	Are you exploring materials to extend asset life?	2	28	100	60	80.00
	How are supplier recommendations for operations and maintenance reviewed for cost effectiveness?	2	0	60	60	60.00
	How do inspection intervals get reviewed or revised?	5	22	80	20	44.00
	How is Maintenance and Renewal strategy managed - what is your/departmental role?	3	20	80	40	60.00
	How is the lifecycle of the asset built into the AM Strategy?	11	25	100	20	45.45
	Intrusive and non-intrusive Inspection, what is the company's strategy - what is your/departmental role?	3	12	60	40	53.33
	Is there a condition-based maintenance programme	5	11	60	40	48.00
	Is there a life extension programme (Tribology programme etc)?	1		40	40	40.00
	Is there a safety and protective device testing programme - how comprehensive?	1		100	100	100.00
	What steps are taken to ensure that the AM strategies are consistent other organisational strategies	1		40	40	40.00
Grand Total		34	22	100	20	51.76


Asset Management Strategy
What steps are taken to ensure that the AM strategies are consistent other organisational strategies
Is there a safety and protective device testing programme - how comprehensive?
Is there a life extension programme (Tribology programme etc)?
Is there a condition-based maintenance programme
Intrusive and non-intrusive Inspection, what is the company's strategy - what is your/departmental role?
How is the lifecycle of the asset built into the AM Strategy?
How is Maintenance and Renewal strategy managed - what is your/departmental role?
How do inspection intervals get reviewed or revised?
How are supplier recommendations for operations and maintenance reviewed for cost effectiveness?
Are you exploring materials to extend asset life?
20
40
60
80
100
Average of Score

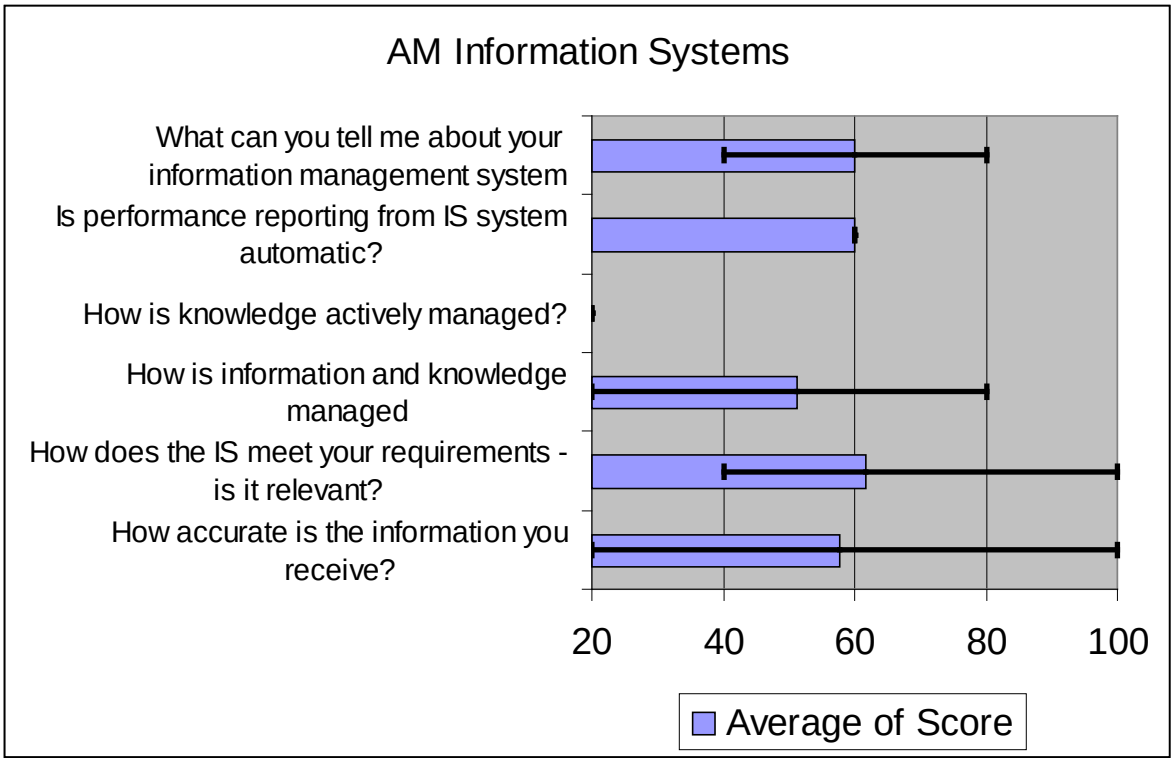
PAS 55 reference:	4.3

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
AM Information, Risk Assessment & Planning	How has your company's business plan been developed	7	20	100	40	68.57
	How is risk identified, assessed and controlled?	31	13	80	40	62.58
	Partnerships and resources - Are new assets and projects modelled for 'whole systems' impact?	1		100	100	100.00
	Strengths, areas for improvement and any thoughts/suggestions	3	12	40	20	33.33
	Who was involved in its development	14	13	80	40	67.14
Grand Total		56	16	100	20	63.57



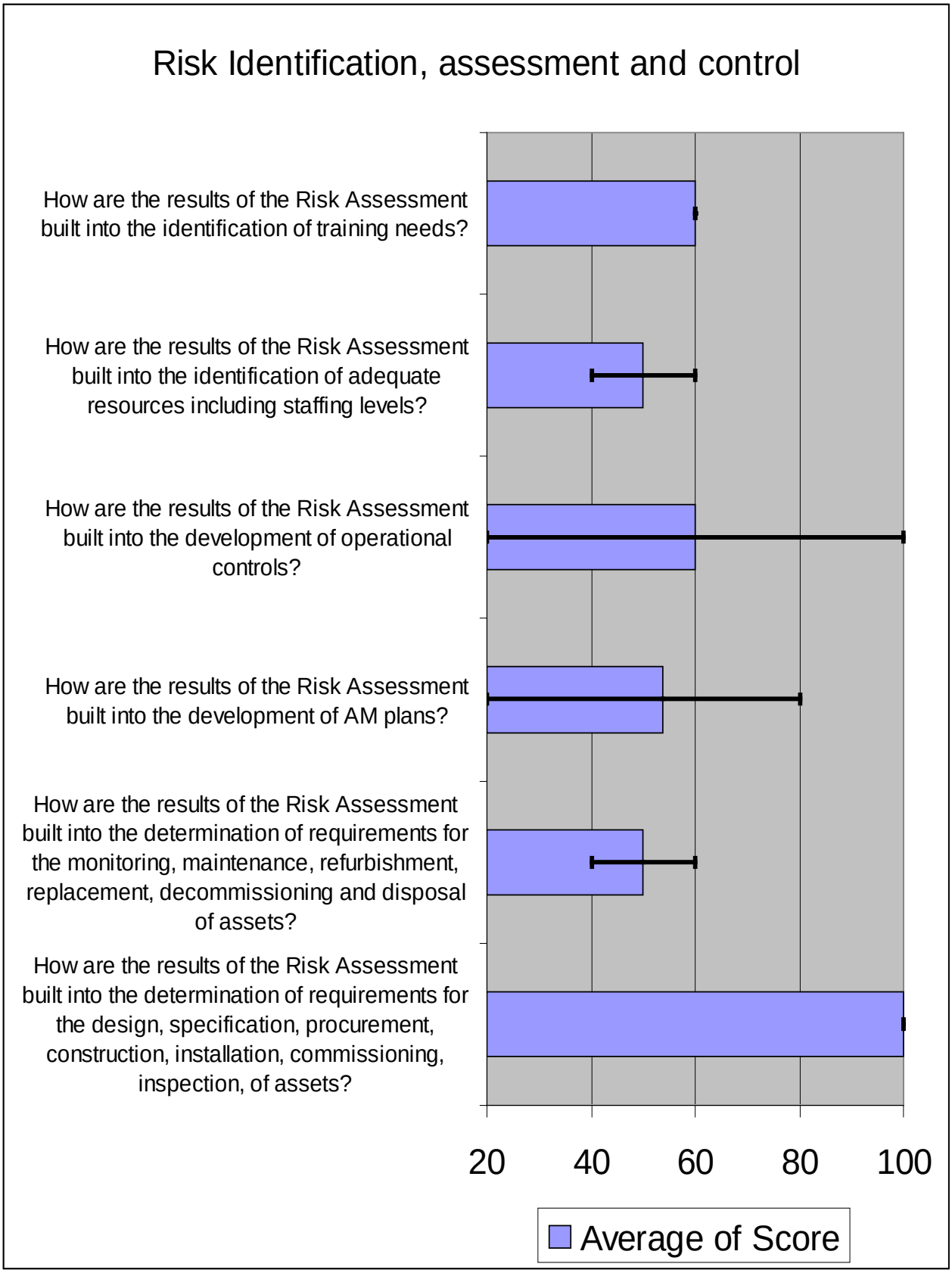
PAS 55 reference:	4.3.1

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
AM Information Systems	How accurate is the information you receive?	25	21	100	20	57.60
	How does the IS meet your requirements - is it relevant?	33	18	100	40	61.82
	How is information and knowledge managed	9	23	80	20	51.11
	How is knowledge actively managed?	1		20	20	20.00
	Is performance reporting from IS system automatic?	1		60	60	60.00
	What can you tell me about your information management system	6	22	80	40	60.00
Grand Total		75	20	100	20	58.40



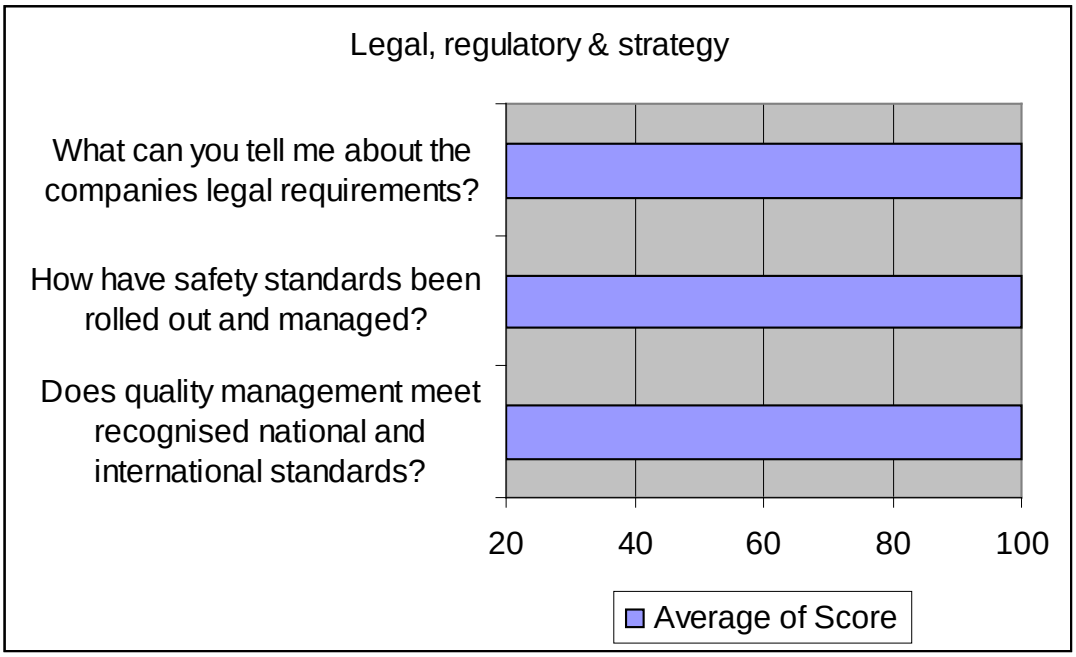
PAS 55 reference:	4.3.2

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Risk identification, assessment and control	How are the results of the Risk Assessment built into the determination of requirements for the design, specification, procurement, construction, installation, commissioning, inspection, of assets?	1		100	100	100.00
	How are the results of the Risk Assessment built into the determination of requirements for the monitoring, maintenance, refurbishment, replacement, decommissioning and disposal of assets?	2	14	60	40	50.00
	How are the results of the Risk Assessment built into the development of AM plans?	13	15	80	20	53.85
	How are the results of the Risk Assessment built into the development of operational controls?	3	40	100	20	60.00
	How are the results of the Risk Assessment built into the identification of adequate resources including staffing levels?	2	14	60	40	50.00
	How are the results of the Risk Assessment built into the identification of training needs?	1		60	60	60.00
Risk identification, assessment and control Total		22	20	100	20	56.36


Risk Identification, assessment and control
How are the results of the Risk Assessment built into the identification of training needs?
How are the results of the Risk Assessment built into the identification of adequate resources including staffing levels?
How are the results of the Risk Assessment built into the development of operational controls?
How are the results of the Risk Assessment built into the development of AM plans?
How are the results of the Risk Assessment built into the determination of requirements for the monitoring, maintenance, refurbishment, replacement, decommissioning and disposal of assets?
How are the results of the Risk Assessment built into the determination of requirements for the design, specification, procurement, construction, installation, commissioning, inspection, of assets?
20
40
60
80
100
Average of Score

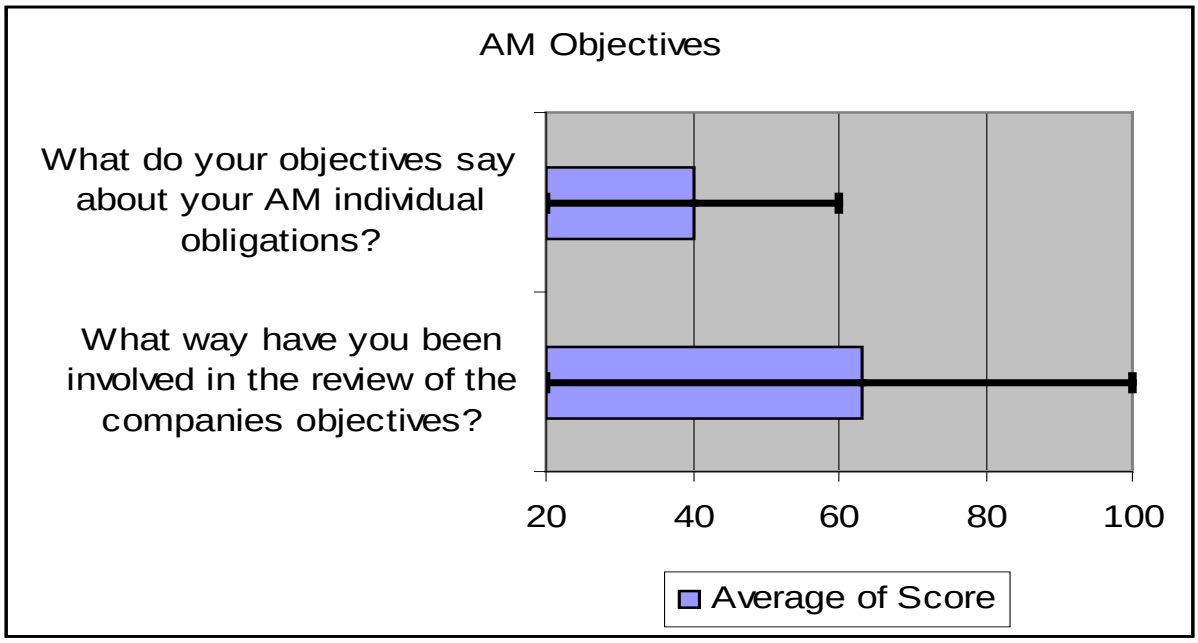
PAS 55 reference:	4.3.3

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Legal, Regulatory & Statutory	Does quality management meet recognised national and international standards?	1		100	100	100.00
	How have safety standards been rolled out and managed?	1		100	100	100.00
	What can you tell me about the companies legal requirements?	1		100	100	100.00
Legal, Regulatory & Statutory Total		3	0	100	100	100.00
Grand Total		3	0	100	100	100.00



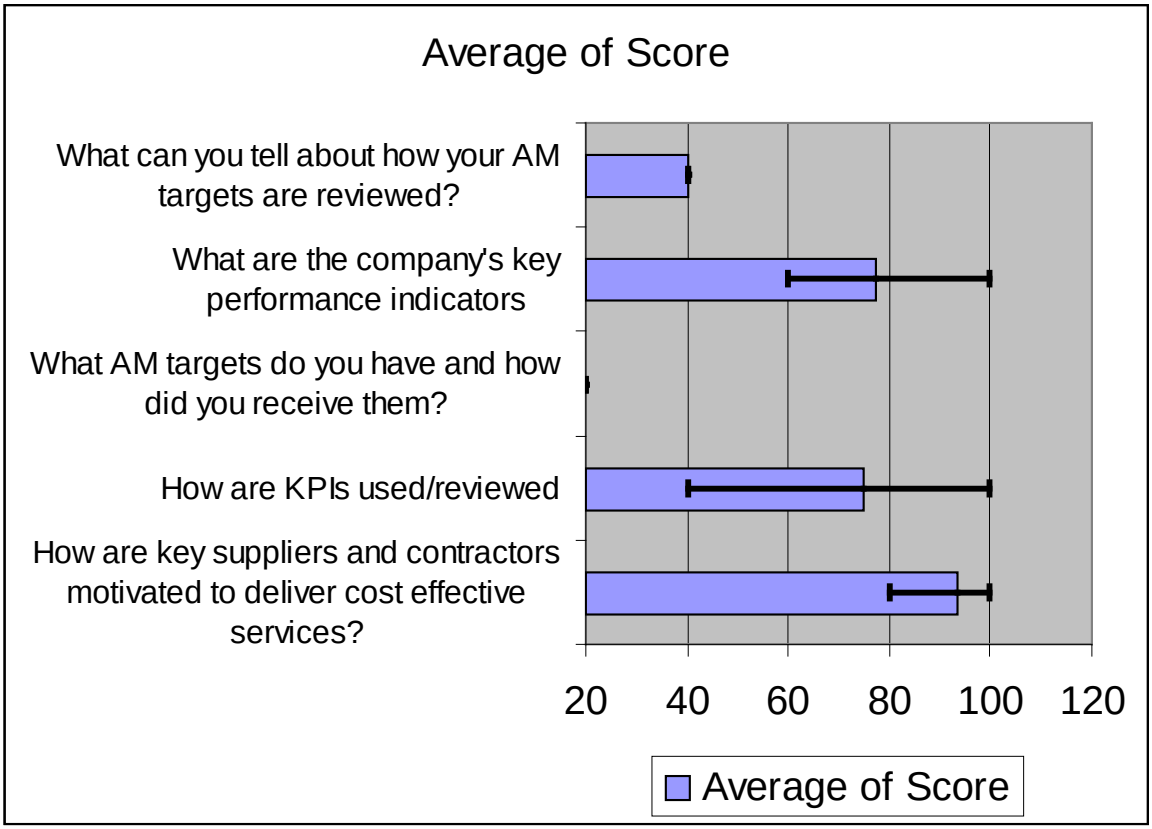
PAS 55 reference:	4.3.4

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
AM Objectives	What way have you been involved in the review of the companies objectives?	6	29	100	20	63.33
Asset Management Objectives	What do your objectives say about your AM individual obligations?	4	16	60	20	40.00
Grand Total		10	27	100	20	54.00



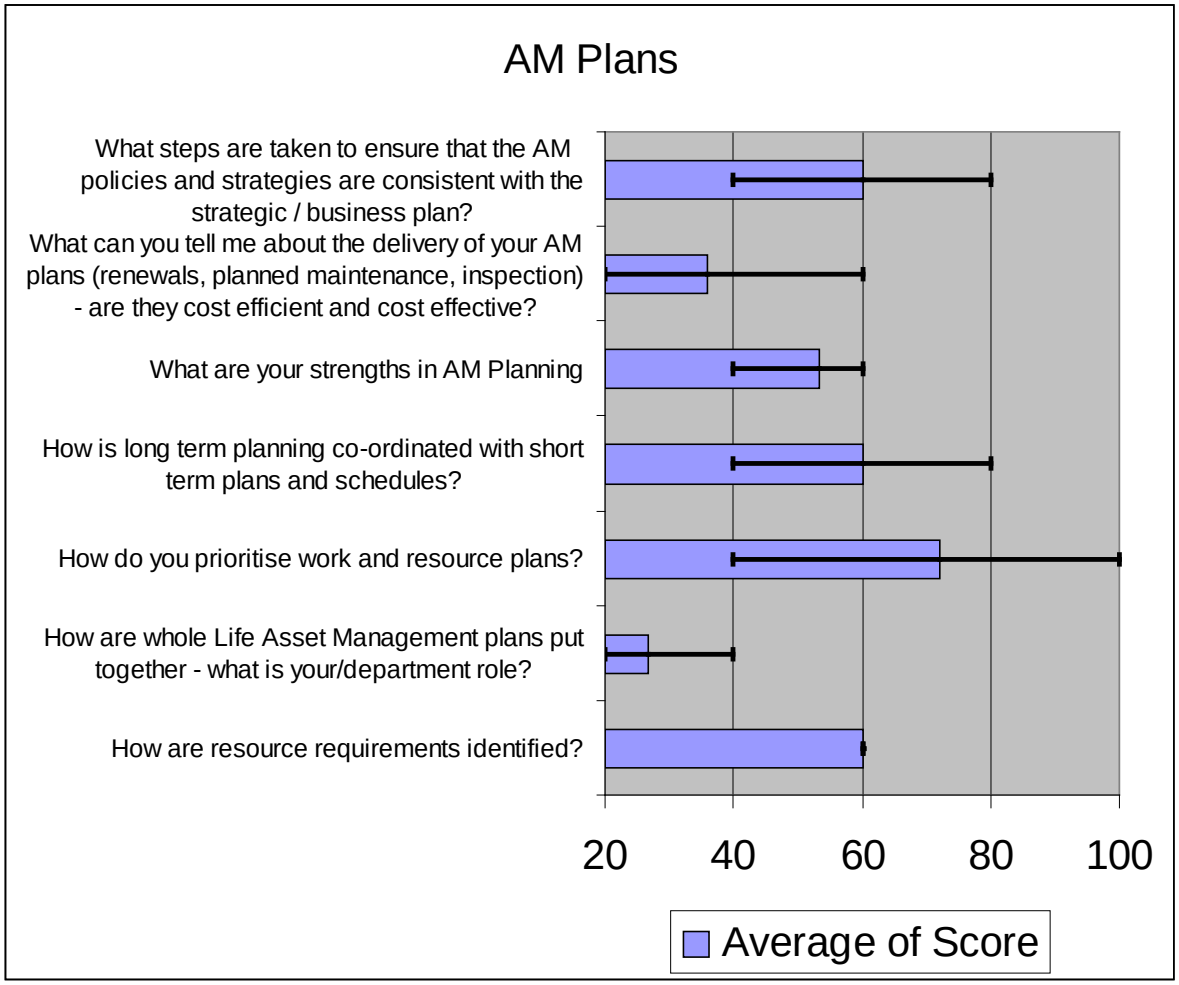
PAS 55 reference:	4.3.5

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Asset performance and condition targets	How are key suppliers and contractors motivated to deliver cost effective services?	3	12	100	80	93.33
	How are KPIs used/reviewed	36	15	100	40	75.00
	What AM targets do you have and how did you receive them?	1		20	20	20.00
	What are the company's key performance indicators	15	13	100	60	77.33
	What can you tell about how your AM targets are reviewed?	1		40	40	40.00
Grand Total		56	17	100	20	75.00



PAS 55 reference:	4.3.6

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
AM Plans	How are resource requirements identified?	1		60	60	60.00
	How are whole Life Asset Management plans put together - what is your/department role?	3	12	40	20	26.67
	How do you prioritise work and resource plans?	5	23	100	40	72.00
	How is long term planning co-ordinated with short term plans and schedules?	2	28	80	40	60.00
	What are your strengths in AM Planning	3	12	60	40	53.33
	What can you tell me about the delivery of your AM plans (renewals, planned maintenance, inspection) - are they cost efficient and cost effective?	10	13	60	20	36.00
	What steps are taken to ensure that the AM policies and strategies are consistent with the strategic / business plan?	3	20	80	40	60.00
Grand Total		27	22	100	20	48.89

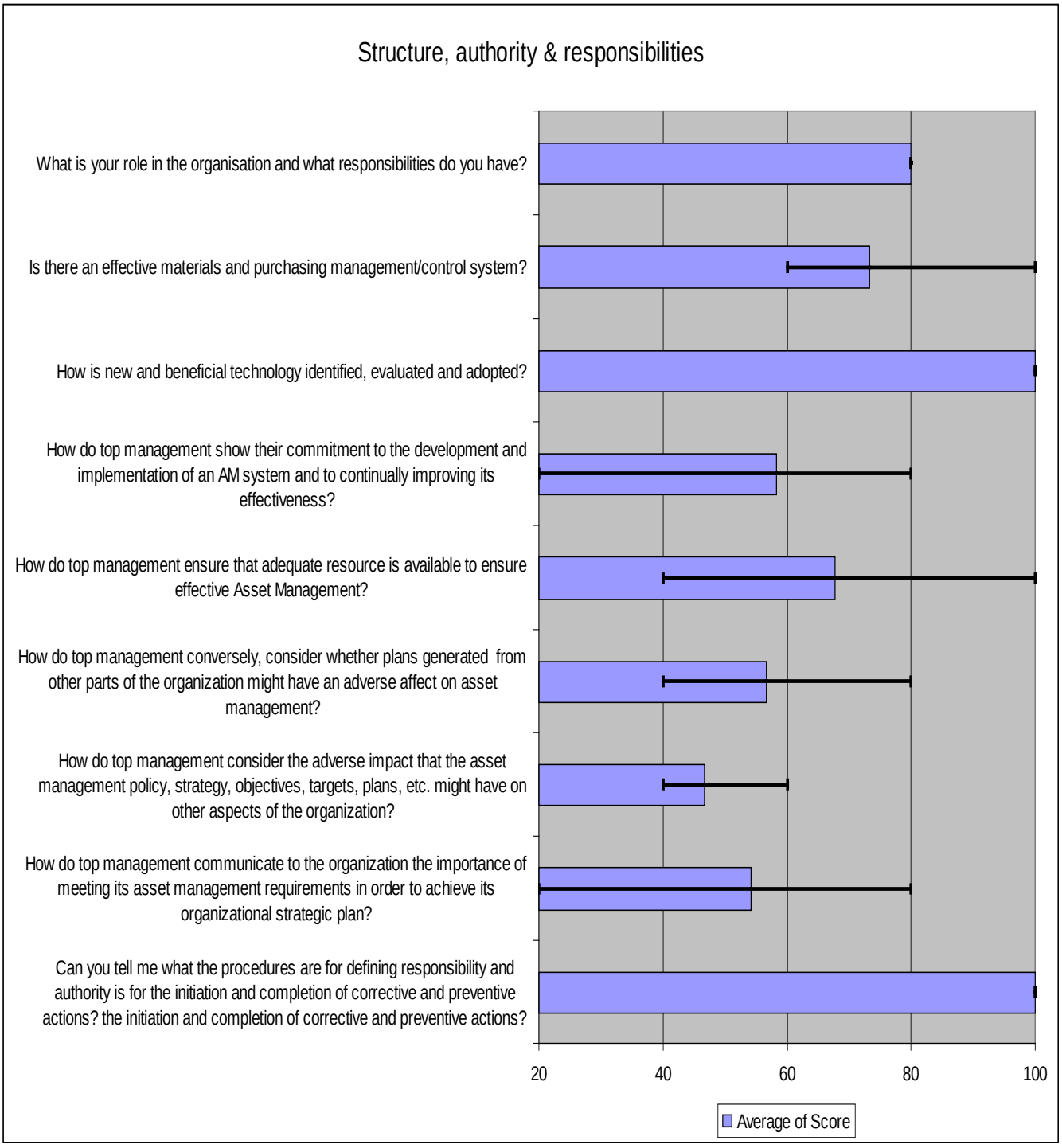


PAS 55 reference:	4.4

		Data			
PAS 55 section	Question	Count of Score	Max of Score	Min of Score	Average of Score
Implementation & Operation	Is there a formalised work order, management and supervision system?	1	80	80	80.00
Grand Total		1	80	80	80.00

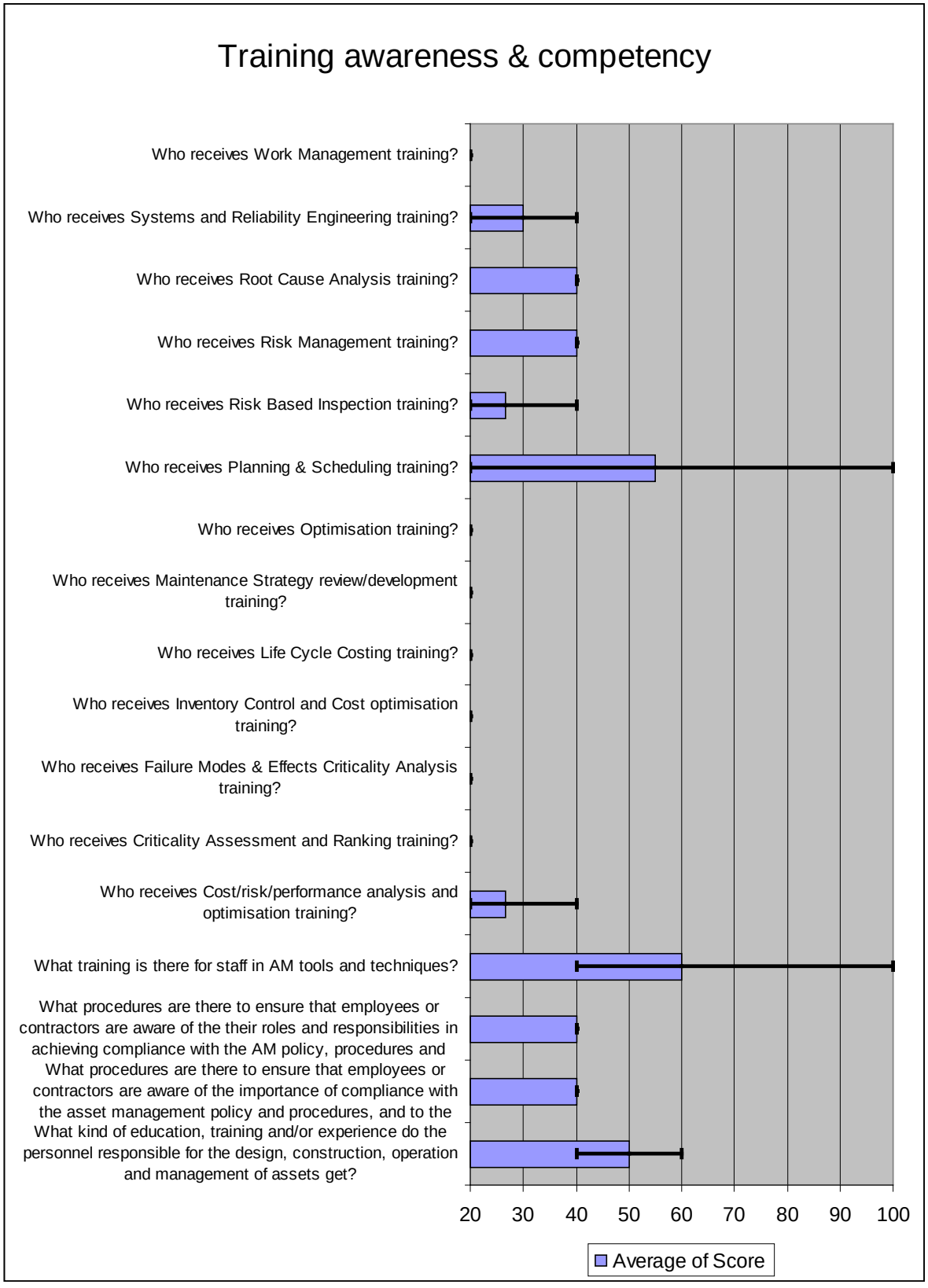
PAS 55 reference:	4.4.1

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Structure, authority and responsibilities for AM	Can you tell me what the procedures are for defining responsibility and authority is for the initiation and completion of corrective and preventive actions? the initiation and completion of corrective and preventive actions?	1		100	100	100.00
	How do top management communicate to the organization the importance of meeting its asset management requirements in order to achieve its organizational strategic plan?	7	22	80	20	54.29
	How do top management consider the adverse impact that the asset management policy, strategy, objectives, targets, plans, etc. might have on other aspects of the organization?	3	12	60	40	46.67
	How do top management conversely, consider whether plans generated from other parts of the organization might have an adverse affect on asset management?	6	20	80	40	56.67
	How do top management ensure that adequate resource is available to ensure effective Asset Management?	13	19	100	40	67.69
	How do top management show their commitment to the development and implementation of an AM system and to continually improving its effectiveness?	12	20	80	20	58.33
	How is new and beneficial technology identified, evaluated and adopted?	1	!	100	100	100.00
	Is there an effective materials and purchasing management/control system?	3	23	100	60	73.33
	What is your role in the organisation and what responsibilities do you have?	1		80	80	80.00
Structure, authority and responsibilities for AM Total		47	21	100	20	62.55


Structure, authority & responsibilities
What is your role in the organisation and what responsibilities do you have?
Is there an effective materials and purchasing management/control system?
How is new and beneficial technology identified, evaluated and adopted?
How do top management show their commitment to the development and implementation of an AM system and to continually improving its effectiveness?
How do top management ensure that adequate resource is available to ensure effective Asset Management?
How do top management conversely, consider whether plans generated from other parts of the organization might have an adverse affect on asset management?
How do top management consider the adverse impact that the asset management policy, strategy, objectives, targets, plans, etc. might have on other aspects of the organization?
How do top management communicate to the organization the importance of meeting its asset management requirements in order to achieve its organizational strategic plan?
Can you tell me what the procedures are for defining responsibility and authority is for the initiation and completion of corrective and preventive actions? the initiation and completion of corrective and preventive actions?
20
40
60
80
100
Average of Score

PAS 55 reference:	4.4.2

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Training Awareness & Competence	What kind of education, training and/or experience do the personnel responsible for the design, construction, operation and management of assets get?	2	14	60	40	50.00
	What procedures are there to ensure that employees or contractors are aware of the importance of compliance with the asset management policy and procedures, and to the requirements of the asset management system?	1		40	40	40.00
	What procedures are there to ensure that employees or contractors are aware of the their roles and responsibilities in achieving compliance with the AM policy, procedures and requirements of the AM processes, including emergency preparedness?	1		40	40	40.00
	What training is there for staff in AM tools and techniques?	3	35	100	40	60.00
	Who receives Cost/risk/performance analysis and optimisation training?	3	12	40	20	26.67
	Who receives Criticality Assessment and Ranking training?	2	0	20	20	20.00
	Who receives Failure Modes & Effects Criticality Analysis training?	2	0	20	20	20.00
	Who receives Inventory Control and Cost optimisation training?	1		20	20	20.00
	Who receives Life Cycle Costing training?	3	0	20	20	20.00
	Who receives Maintenance Strategy review/development training?	1		20	20	20.00
	Who receives Optimisation training?	2	0	20	20	20.00
	Who receives Planning & Scheduling training?	4	34	100	20	55.00
	Who receives Risk Based Inspection training?	3	12	40	20	26.67
	Who receives Risk Management training?	2	0	40	40	40.00
	Who receives Root Cause Analysis training?	3	0	40	40	40.00
	Who receives Systems and Reliability Engineering training?	2	14	40	20	30.00
	Who receives Work Management training?	1		20	20	20.00
Training Awareness & Competence Total		36	20	100	20	34.44


Training awareness & competency
Who receives Work Management training?
Who receives Systems and Reliability Engineering training?
Who receives Root Cause Analysis training?
Who receives Risk Management training?
Who receives Risk Based Inspection training?
Who receives Planning & Scheduling training?
Who receives Optimisation training?
Who receives Maintenance Strategy review/development training?
Who receives Life Cycle Costing training?
Who receives Inventory Control and Cost optimisation training?
Who receives Failure Modes & Effects Criticality Analysis training?
Who receives Criticality Assessment and Ranking training?
Who receives Cost/risk/performance analysis and optimisation training?
What training is there for staff in AM tools and techniques?
What procedures are there to ensure that employees or contractors are aware of the their roles and responsibilities in achieving compliance with the AM policy, procedures and
What procedures are there to ensure that employees or contractors are aware of the importance of compliance with the asset management policy and procedures, and to the
What kind of education, training and/or experience do the personnel responsible for the design, construction, operation and management of assets get?
20
30
40
50
60
70
80
90
100
Average of Score

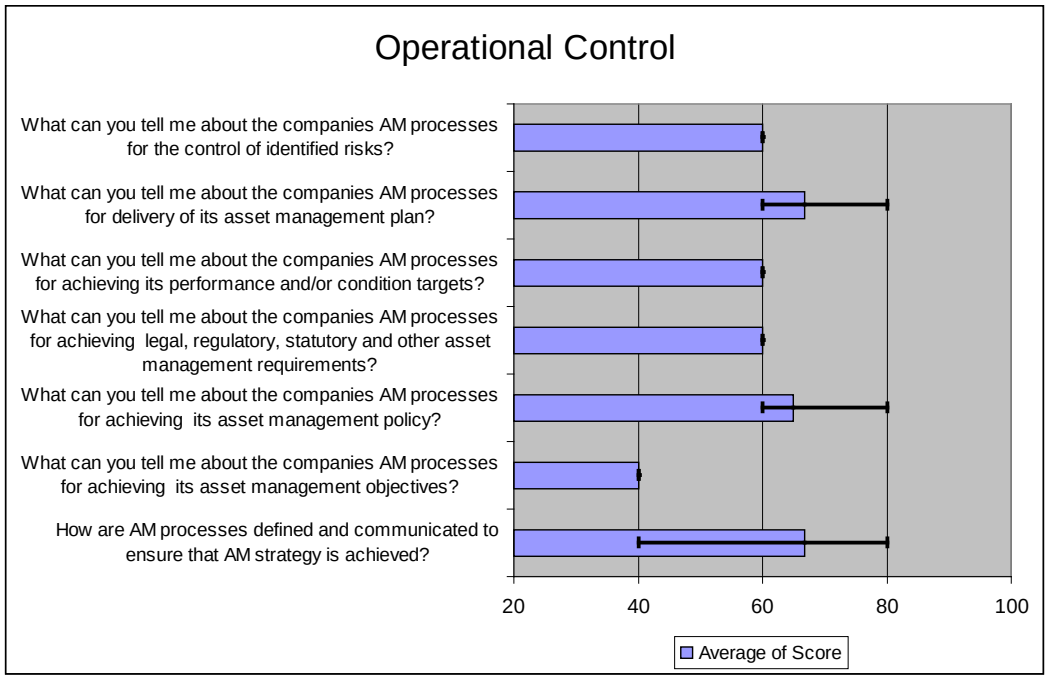
PAS 55 reference:	4.4.3

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Consultation and communication	What AM information do you receive and is it timely and relevant?	4	34	100	20	65.00
Consultation and communication Total		4	34	100	20	65.00
PAS 55 reference:	4.4.4					

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Documentation	How is the AM Policy documented, implemented and maintained?	5	22	100	40	64.00
Documentation Total		5	22	100	40	64.00

PAS 55 reference:	4.4.6

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Operational control	How are AM processes defined and communicated to ensure that AM strategy is achieved?	3	23	80	40	66.67
	What can you tell me about the companies AM processes for achieving its asset management objectives?	1		40	40	40.00
	What can you tell me about the companies AM processes for achieving its asset management policy?	4	10	80	60	65.00
	What can you tell me about the companies AM processes for achieving legal, regulatory, statutory and other asset management requirements?	1		60	60	60.00
	What can you tell me about the companies AM processes for achieving its performance and/or condition targets?	1		60	60	60.00
	What can you tell me about the companies AM processes for delivery of its asset management plan?	3	12	80	60	66.67
	What can you tell me about the companies AM processes for the control of identified risks?	2	0	60	60	60.00
Operational control Total		15	13	80	40	62.67

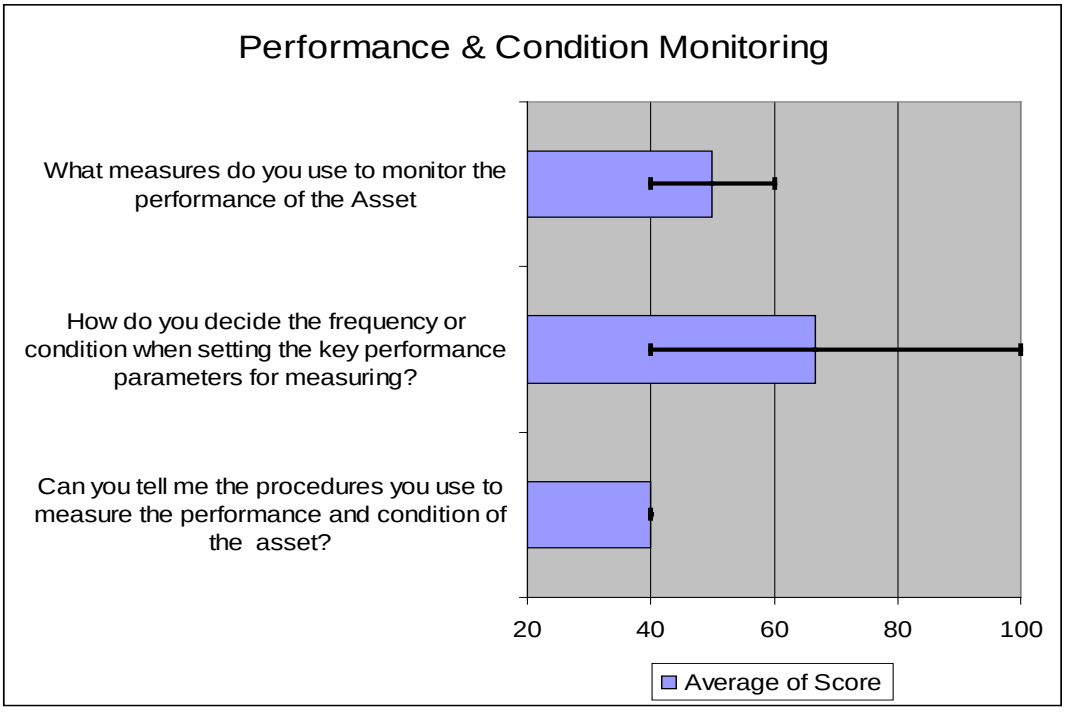


PAS 55 reference:	4.5

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Checking & Corrective Action	How is change controlled and audited - what is your/departments involvement?	11	24	100	40	74.55
Checking & Corrective Action Total		11	24	100	40	74.55

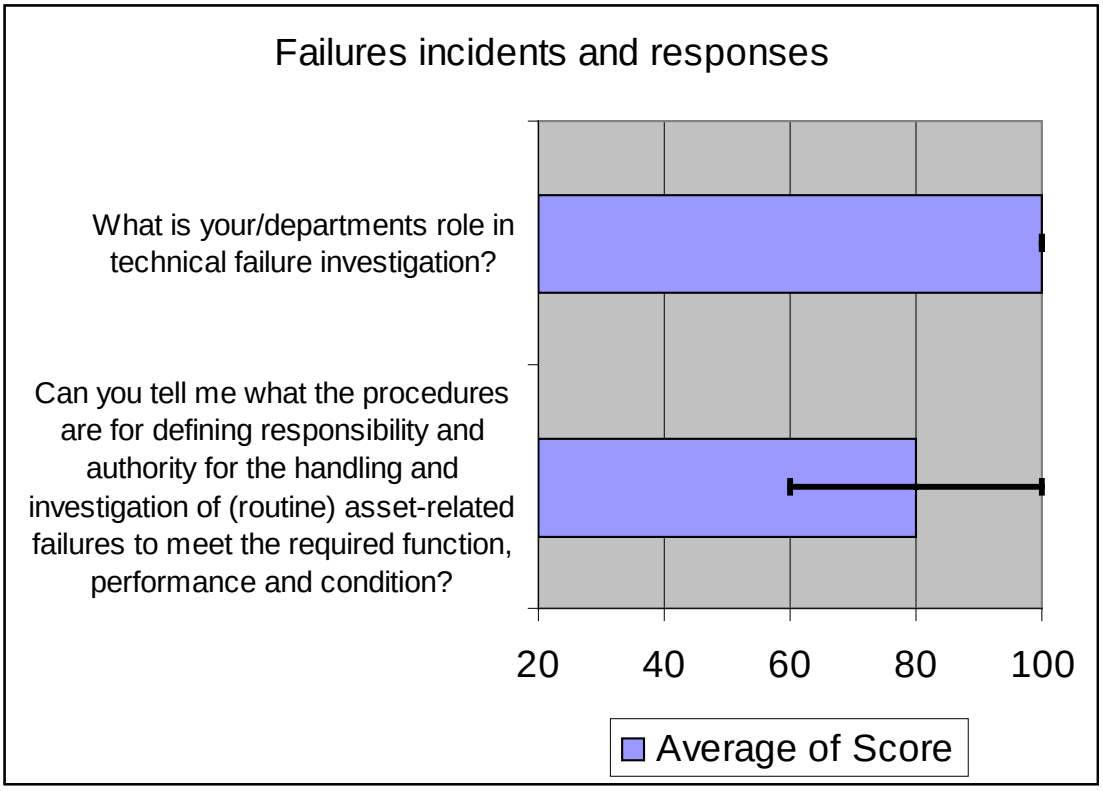
PAS 55 reference:	4.5.1

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Performance and condition monitoring	Can you tell me the procedures you use to measure the performance and condition of the asset?	2	0	40	40	40.00
	How do you decide the frequency or condition when setting the key performance parameters for measuring?	3	31	100	40	66.67
	What measures do you use to monitor the performance of the Asset	2	14	60	40	50.00
Performance and condition monitoring Total		7	22	100	40	54.29



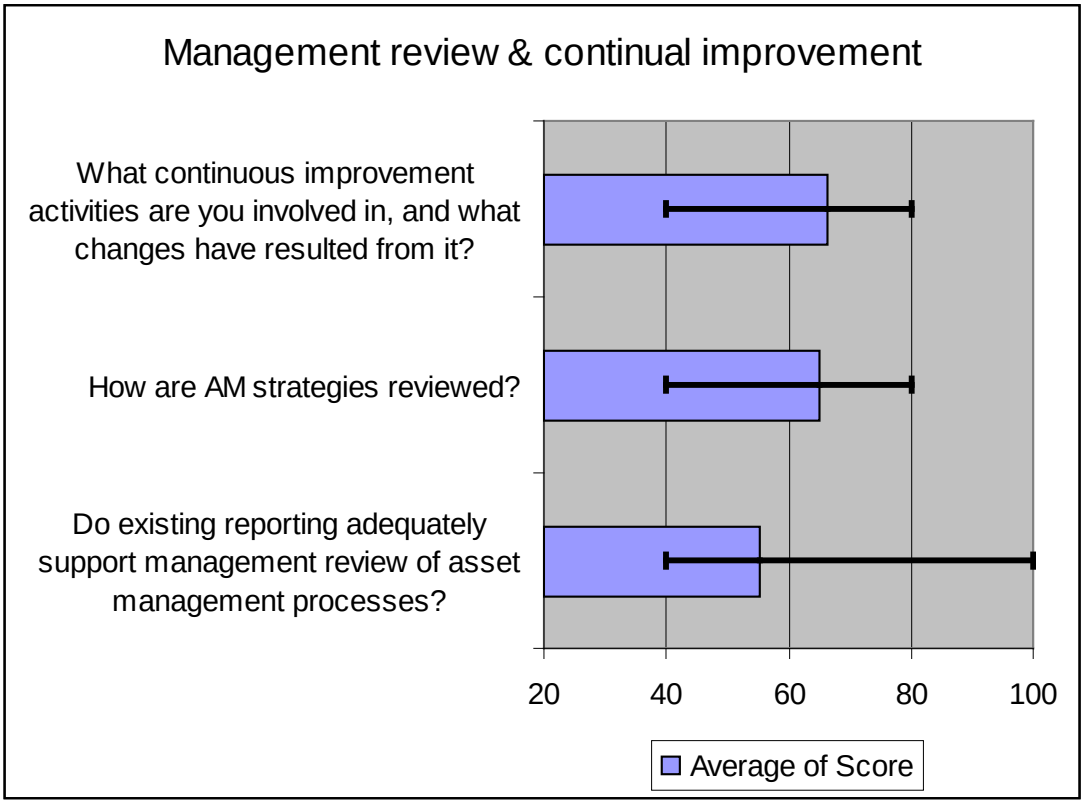
PAS 55 reference:	4.5.2

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Failures, incidents and responses	Can you tell me what the procedures are for defining responsibility and authority for the handling and investigation of (routine) asset-related failures to meet the required function, performance and condition?	2	28	100	60	80.00
	What is your/departments role in technical failure investigation?	2	0	100	100	100.00
Failures, incidents and responses Total		4	20	100	60	90.00



PAS 55 reference:	4.6

		Data				
PAS 55 section	Question	Count of Score	StdDev of Score	Max of Score	Min of Score	Average of Score
Management Review & Continual Improvement	Do existing reporting adequately support management review of asset management processes?	13	17	100	40	55.38
	How are AM strategies reviewed?	4	19	80	40	65.00
	What continuous improvement activities are you involved in, and what changes have resulted from it?	16	14	80	40	66.25
Management Review & Continual Improvement Total		33	16	100	40	61.82



APPENDIX 5 1:2:1 Interview Responses Categorised and Grouped By Questions

Perceived Benefits of an AM Approach – outcomes of 1:2:1's.

Answers to the Question

"What can you see as the potential benefits of an Asset Management approach?

PEOPLE RESULTS

1. *Job satisfaction*
2. *Clear decision paths and an efficient well understood process. 'If everyone understand how and why we justify things, then it is more likely that people will follow the process and make it work'.*
3. *Well run company*
4. *Work and AM together under one umbrella*
5. *Identify gaps – whole sale turn things on its head*
6. *Bubble to surface – critical issues – QA questions critical assessment*
7. *Overall very positive and supportive but with the noted points for direction*
8. *Accountability – responsibility – discussion concluded*
9. *Slowly go into the culture of the people*
10. *Education – very few have a good understanding of optimising the cost of ownership 'from cradle to grave'*
11. *Need to make sure employees understand what AM means practically to them*
12. *Engaging our people*
13. *Core competence for gas utility*
14. *Involvement down to front-line part of the solution – ownership of solutions*
15. *Pride – re-install – rally around – build on it*
16. *Reduce safety risk*
17. *Understand asset – strengths – weakness'*
18. *Worthwhile and in fact essential – strong advocate of AM.*
19. *Understand where we are – its importance – need to be realistic when we want it*
20. *Better use of resources $ and people*
21. *Strong advocate (good intellectual understanding)*
22. *Awareness of AM concepts – get people thinking holistic*
23. *Decision support mechanism – understand it implications – demonstrable to stakeholders*
24. *Holistic approach – human – tangible and the intangible*
25. *Involvement of all the people*
26. *Improving understanding*
27. *Important to get the discipline right and processes in place.*
28. *There's room for improvement*
29. *Communicate – knowledge – better use of time*
30. *Descriptive*
31. *Increased Employee Pride*
32. *Understanding by employees of how different we are*
33. *System improvement*

Answers to the Question

"What can you see as the potential benefits of an Asset Management approach?

PEOPLE RESULTS (continued)

34. Concept of 'coddling the assets' to make sure that risk was controlled – recognised the appropriate level of detail should match criticality. Very good intellectual understanding of risk management including corporate risk and strategic financing in a regulated business. Not convinced that much would change in funding, but more needed to be done to finish the job of putting enterprise risk management in place.
35. Later on form now free up some resources
36. Consistency of procedures – rationale – so that compliance not an issue

CUSTOMER RESULTS

1. Well run company
2. Better Customer satisfaction
3. Comfort for EMT that work is being done – safety and reliability – sleep at night

SOCIETY RESULTS

1. Reduced incidents
2. Well run company
3. Public Reliability – spending on safety
4. Comfort for EMT that work is being done – safety and reliability – sleep at night

KEY PERFORMANCE RESULTS

1. Ensures that we are sensitive of the right important issues
2. Better reliability
3. Dollar benefits
4. Well run company
5. Leaps and bounds – station improvements – "Station" design – how can we use this elsewhere – AM approach should be able to transfer that knowledge
6. Better Risk/Reward ratio – more optimal
7. A little bit of money doing the right now avoids the big bucks later
8. Use capital and O&M more efficiently
9. Deliver on risk
10. Investor relationships with parent company – put a value on it and get it out – every $ spent accountable
11. Strategic opportunity for us
12. Effectiveness of our organisation
13. Operational excellence – the way to achieve it
14. AM should enable right balance to be struck. Noted that currently capital investment is incentivised effectively by regulatory model – resulting in AM policy being skewed to match financial signals in some cases.

Answers to the Question

"What can you see as the potential benefits of an Asset Management approach?

KEY PERFORMANCE RESULTS *(continued)*

15. Enbridge to leverage business benefit from AM, and use gained experience to extend their business interests by acquisition of other gas distribution companies – opportunity to 'do it again' and thus grow the business

16. Operate the system more effectively –utilise dollars in CAPEX and OPEX more effectively
17. Financial effectiveness – the bottom line
18. Growth – extend the service
19. Acquisitions
20. More comprehensive investment plans – not by a single driver
21. Better overall sense of Business Direction
22. Better Cost effectiveness

23. Impacting on how we do business
24. Focus expenditures – OPEX – CAPEX – priorities
25. Better use of assets.
26. Making better repair/replace decisions.
27. Making better long term decisions.
28.*Focus resources on right priorities.*

29. Better use of resources $ and people
30. Life cycle costings – integration of whole processes
31. Optimum performance of the assets
32. *Better financial understanding of repair / replacement decisions*
33. *Life cycle – depreciation – understanding this*
34. Financial benefits
35. Company needs systematic methodology – maintenance optimised
36. Life cycle costing understood
37. Support decision for repair / replace
38. CAPEX & OPEX – understanding its approach
39. *Short/long term balancing*
40. Managing the company strategically
41. *More rigour – know what needs to be done. Changing the type of work – more of some, less of other, based on risk*
42. Respond to Emergencies
43. Track Assets – purchasing to putting in the ground
44. *Inventory control*
45. *Plant location*
46. Cost savings
47. Using resources where required

Answers to the Question

"What can you see as the potential benefits of an Asset Management approach?

KEY PERFORMANCE RESULTS *(continued)*

48. *Making the management of assets cost effective, matching the constraints of the commercial regulated model and managing human (moral) issues in a consistent way is important and if AM can make this happen this is good – but it is really just good management – the term asset management is confusing.*
49. *Informed decision making – both consequences and impact on life cycle*
50. *The risks and recognised*
51. *Allocation of costs and resources*
52. *Right tools – information a picture of condition of Asset Mains*
53. *Always have the right equipment*
54. *Leads to some tools / enablers*
55. *More effective spending*
56. *More effective use of resources $ / time / People*
57. *Integrated use of data – clear business benefit*
58. *Better understanding of criticality and the frequency of work*
59. *Improved forecast flow of work*
60. *Look at facts and then prioritise- decision making process influence*
61. *Rigor of the science behind it*
62. *Helping company work on valuable work minimising downtime*
63. *Better management of assets, reduced risk, improved operating efficiency. "This can't hurt the bottom line"*
64. *Rich data – freeing up our resources to work on the critical bits*
65. *Refocus on the long term issues*

REGULATION

1. *Better Regulation*
2. *Regulatory defence*
3. *Reduced incidents*
4. *Regulatory strategy – most influence using Risk and Asset Management*
5. *To know we are spending money wisely and that we have a sustainable business.*
6. *Ability to defend every decision*
7. *OEB Regulator – the interveners – better understanding of the company*
8. *Defend what you are spending if Regulator asks*

Answers to the Question

"What can you see as the potential benefits of an Asset Management approach?

COMMUNICATIONS

1. *Communication will be crucial – need to tie in across the executive and not be limited to one department. Glenn should take lead, but the EMT senior team need to be fully engaged. Some regular interaction appropriate – progressing actions across the business e.g. ops.*
2. *Understand relationships in picture – balanced approach*
3. *Provide an understandable process*
4. *Provide a framework / a set of guidelines and the "What to do"*
5. *Tool for capability*
6. *Integration and alignment of business – moving out of silos. Consistency of approach to managing assets. Optimisation of the life and value of the assets.*

SUMMARY OF ANSWERS & COMMENTS

Total comments = 122

- People 36
- Customer 3
- Society 4
- Key performance 65
- Regulation 8
- Communications 6

PERCEIVED RISKS TO ADOPTING AN AM APPROACH

Answers to the Question

"What risks do you see in taking an Asset Management approach?"

LEADERSHIP

LEARNING & UNDERSTANDING

1. *Knowledge gap*
2. *Front-line need to operate at a high level – urgent education need*
3. *Training a luxury – priorities lot of effort into the philosophy – culture*
4. *People's ability to understand the concept and invest the time needed to understand*
5. *Training not done properly*
6. *Getting the attention – integration – not just another initiative*
7. *Order of magnitude*

CULTURE

8. *I'll do what I've always done*
9. *Cultural clashes – challenges – fire fighting – management*
10. *Dinosaurs will say its okay now so why change*
11. *Not committed either in resources or time - step back from confrontation*
12. *Resistance to change*
13. *Making the assumption that we are further along than we are*
14. *Expectation not achieved*
15. *Potential overload of change initiatives – eg Operational Excellence*
16. *Culturally the company does not like to talk about sensitive issues – possibility of inviting bad publicity and damaging image.*

REGULATION

17. *Regulatory impact – lead not be led*
18. *Regulator will expect us to do better – keep rates down*
19. *Common understanding of what we are doing – links to Regulator*
20. *Will the regulator accept the approach?*
21. *The Regulatory environment*

OTHERS*(leaderships issues****)***

22. *Need to stick with it and ensure it is properly embedded. Sometimes Enbridge don't keep with ideas long enough.*
23. *More risks if we don't do it.*
24. *What should we focus on*
25. *Short term focus – current business drivers*
26. *Organisational readiness to accept the approach*
27. *Argument at Executive priorities*
28. *Clear accountability*
29. *Not an issue if the Executive give the go-ahead – others will follow*

Answers to the Question

"***What risks do you see in taking an Asset Management approach?"***

COMMUNICATIONS

1. *Misuse of language*
2. *Fine as long as it tells you what you want to hear – other messages may not be so well received*
3. *Communications between Engineering – planning – operations*
4. *Case needs to be compelling*
5. *Confusion in Roles under AM structure.*
6. *Too early to comment – needs good communication.*
7. *There should be no real issues, but the message needs to be clear and there is a danger of it being interpreted incorrectly.*
8. *The message needs credibility – and appropriate communications styles that get engagement*

PEOPLE

1. *Employee front – line Supervisor level big gaps not systematic thinkers*
2. *Culture change required of people at all levels*
3. *Lack of commitment because it is yet another initiative – has to be seen as something to help*
4. *Emphasis on people who stay – the supervisors – flavour of the month*
5. *Big challenge is change management – the people issue*
6. *Training on it*
7. *People's buy – in*
8. *People are mentally chronically fatigued*
9. *Fatigue – gut wrenching change*
10. *A year without a change*

POLICY & STRATEGY

1. *Risk of change – the difficulty of giving up control. Actually consider that the management and mitigation of these issues is part of the challenge of good asset management.*
2. *The right time line – getting started at the right time*
3. *Enablers in place first*
4. *Gaps in enablers*
5. *When to introduce / be sure that we can take it on.*
6. *Will have a hard time to stop corporate focus on quarterly figures and get real sign on to managing long term issues.*
7. *Company been through a lot of change – could be seen as another flavour of the month.*
8. *Let's not rush – don't try and rush it in*
9. *Is it seen as the top priority?*
10. *Demonstrate that repair shops are not needed – the risk of this and its implications*
11. *Loose repair shop – no alternatives – quality of product*
12. *Depends on the detail – could become a burden to manage if not done right*

Answers to the Question

"What risks do you see in taking an Asset Management approach?"

POLICY & STRATEGY (*continued)*

13. *Reluctance to acknowledge risk*
14. *If this moves power/control to engineering*
15. *Properly implemented*
16. *If you don't do what it tells you – you end up with possible culpability – if you didn't know it could be less of a risk***!**
17. *Risk – understanding the implications of making any changes. Concerned about getting the level of detail right. 'Need accurate modelling, the devil is in the detail'.*
18. *Value added needs to be clear*
19. *Don't think replacement – repair decision*
20. *Cost management – still some issues with SDA's*
21. *Timely manner*
22. *Bigger scope – an issue*
23. *Opportunity Costs*
24. *Could spend too much on this if we get it wrong – say wrong risk management system*
25. *Work Management – telling contractors how to do work – should let them do it*
26. *Job – cuts – change to the organisation*

RESOURCES

1. *Multiple projects – resources not there*
2. *Overloaded – too many initiatives – need to prioritise*
3. *Danger of yet another initiative – over load*
4. *Number of the things we are doing*
5. *All change means extra cost – can we sell it*
6. *History of not acting (10 old risk assessments)- need to get to operations*
7. *Side benefit*
8. *Conflict over resources (in operations)*
9. *Risk of inadequate investment if approach is not adopted – sustainable business issue.*
10. *Competing priorities*
11. *Resourcing an issue – not enough time or people*
12. *Too many initiatives*
13. *Budget and people constraints*
14. *Too many initiatives – we have to run the models – its used and abused – more they can do to check before reaching us – ENVISION – SDA (Strategic Distribution Alliance) there's double counting of costs / benefits*
15. *The impact 1 initiative would have on another*
16. *Could get lost in other initiatives*
17. *Huge risk is overload*
18. *Too much on the go – initiative overload*
19. *Lack of involvement (resource)*
20. *More bureaucracy to justify expenditure*
21. *'Depends where we fall' – want to see what it looks like*

Answers to the Question

"What risks do you see in taking an Asset Management approach?"

RESOURCES *(continued)*

22. Is it another initiative …Conflicts with other initiatives
23. *Yet another initiative*
24. Resources – all the other initiatives

PROCESSESS

1. Change management process needs to be effective

2. *Can the organisation live with the outcome of the decision based on modelling – or will it actually revert to the safe option?*
3. *Current savings in the year – lost in rate review*

RESULTS

DATA CAPTURE & USE

1. No issues other than danger of diverting resource from Envision

2. Geographical - issues around estimates – variations difficult to explain

SUMMARY

Total comments = 102

- Leadership 29
- Communications 8
- People 10
- Policy & Strategy 26
- Resources (People & Time) 24
- Processes 3
- Results Data Capture 2

The current frustrations list that will impact upon the deployment of an AM Approach

The current frustrations list that will impact upon the deployment of an AM Approach

Answers to the Question

***"If you could change just one thing at work, what would it be*?**

LEADERSHIP

1. *Expectations of the 'silver bullet' to fix things – need to recognise that there is a need for hard graft to crack the problems.*
2. *Building ownership – accountability – involvement of people more (spread the task across the company more – involve more than the willing horses).*
3. *To be further along in understanding our Management System.*
4. *Would like a more competitive environment.*
5. *Needs to be more Equalitarian – a meritocracy – not based on who likes you – if they are your friends - etc.*
6. *Can rely on commitment – it takes a long time to get it – once they see the benefit.*
7. *Hard to get commitment – you need the right diplomacy – need to pull people along.*
8. *Union Relationships right now.*
9. *Move to incentive driven regulation.*
10. *Would like to change to incentive based regulation ASAP – frustrated by lack of business opportunity.*
11. *Look to the longer term.*
12. *Recognised that AM looks a good framework, would like to use it as a filter to ensure any new initiatives fit with the overall strategy.*
13. *Knowledge management – success rewarded in bonus and has a direct relationship to the degree of success – real commercial freedom – need regulator to bring about.*
14. *Rewards based on results.*
15. *Life cycle – not comfortable with the handle – by '08 will need a robust approach – now is the time to grow that understanding – we have $470M Capital spend – cast iron – accelerated growth – power generation – we will have no excuses for not spending this amount.*
16. *Risk Assessment – there's a lack of consistency across the company – pockets of Best Practice in place – the relevance of the IS system in helping RA is understood – the IS needs to be foremost a Business success rather than just an IT success – we're not at full competence yet – everything is in place – effort is appropriate.*
17. *Its new – a struggle – mind set of the tools – the culture – insulation at head office.*
18. *Improved a lot in 25 years – readiness for change an issue – we want to expand for sure – danger of overload.*
19. *Would like to see a broad shared understanding of the direction we want to be heading.*
20. *Clear vision.*

Answers to the Question

***"If you could change just one thing at work, what would it be*?**

LEADERSHIP (*continued)*

21. *Clear view and understanding to accomplish things – a clear handle.*
22. *Do <u>all</u> initiatives need to be done right now? We need some kind of filter to understand criticality and prioritise the initiatives.*
23. *Each groups has its own priority – ideas from bottom are filtered - EMT only should act as over arch and decide priorities.*
24. *Confusion – lack of direction.*
25. *There is a fear to get Risk out into the Public domain – they are only dipping their toe in the water.*
26. *Managers need to be more of a team player – need leadership skills*
27. *Clarity of understanding of where we are going*
28. *Alignment of initiatives to help us achieve goals / objectives / direction*
29. *Sense of common direction/vision across all employees.*
30. *Pace of change the company thinks we need to move at*
31. *We've had 4 major IT changes in 2 years – Operational Excellence – buzz words*
32. *Go back to a full service organisation – the customer survey shows we have slipped over the years – it was a more exciting place to work*
33. *Only so much we can do – we need clarity and focus – great deal has been done – tasks need purpose – we need fewer things to do.*
34. *Bring sustainability into the business model*
35. *Bring an appropriate incentive mechanism into the business model.*
36. *The current business drivers have led to continuous cutbacks.*
37. *Regulatory targets tend to be aggressive, and the company can be at risk from elements outside its control such as weather.*
38. *Would like to have enough slack to be pro-active rather than reactive.*
39. *Would like some co-ordination and priority to initiatives – currently VPs have their own priority initiatives, makes it difficult to juggle.*
40. *Change the amount of work – quality of work is suffering because of workload*
41. *'Bonus' being used as a stick*
42. *Union that works with management - Refocus of the union on current day realities*
43. *Tie together Operations, Engineering, Finance in the analyses of our business opportunities (business case type structure)*
44. *Improving regulatory environment*
45. *Too many initiatives, need to prioritize, need to clearly understand direction*
46. *Get away from 'flavour of the day'*
47. *Accountabilities are blurred*

Answers to the Question

"If you could change just one thing at work, what would it be?

COMMUNICATIONS

1. *Regional spread – communications could be better across regions – facilities no web-site – information does not flow easily – information not readily available*
2. *It would be good if OD and Fin worked together with clear boundaries with defined roles / responsibilities / accountabilities.*
3. *Communications process is not embedded and not 2 way.*
4. *There are team meetings and annual employee event – the message is cascaded – no return route or feedback loop.*
5. *Involvement is more at a participation level – attend meetings*
6. *Open communications between Engineering and Operations (there are lots of initiatives going on which challenge our communication opportunities)*

PEOPLE ISSUES

1. *A person in the …….. department – old timer – nice guy – can't get him to change or adopt new ideas – it's like pulling teeth – one of my direct reports – he's resistant to change.*
2. *Turn frontline supervisors into leaders not managers*
3. *Engage people more – get them to share their ideas more.*
4. *Giving people the tools to excel in their in jobs.*
5. *Would like to have more freedom to staff up properly.*
6. *Leverage the skill of more of our employee.*
7. *We always use the same people – more people out there who want to contribute*
8. *Group considered experts – work well in teams – don't complain*
9. *Succession planning around manager level a weakness*
10. *People's perception of involvement – what it really means.*
11. *What I am being measured on is not within my control.*
12. *Would also like people with good planning skills – need a particular type of well disciplined multi-tasking individual.*
13. *I'd like to get feedback from my boss – I'd like his involvement – not his participation – I'd like to feel he had ownership/*
14. *People at work should work less hours – more of a home/work balance*
15. *No building platform – lack of solutions – do the staff have the right tools to do the job*
16. *Some people – don't think they know the business model – change the people – instant difference*
17. *Would like to see Enbridge provide a compensation package that would attract and retain staff. Now slipped behind other comparable employment packages.*
18. *Too many people concerned about 'bonus'*
19. *Recognize limitations of the workforce*

Answers to the Question

***"If you could change just one thing at work, what would it be*?**

RESOURCES (people & time)

1. *Holistically – fewer initiatives – resources tight and scattered – everything is a priority – I'd like to achieve these things before we move on*
2. *Get rid of my e-mails – too much – so much in the bracket – too easy to send to everyone – copy – or directed – too time consuming*
3. *Need to ensure there is focus with limited resources.*
4. *Stop trying to run with too many initiatives – do a couple of big items properly.*
5. *Between OD & Fin there's a lot of duplication of effort.*
6. *Would like fewer initiatives so I can get on with the job.*
7. *Resources constraints – when it impacts on the core, that's when it hurts.*
8. *Danger of day job not getting done properly too many initiatives.*
9. *A new me – some support for the day job – resource – knowledge - a person – another me – I'm pulled onto just abut every new initiative – can't do the day job.*
10. *Implement a tool make it work – use it effectively – complete the job*
11. *Fewer meetings.*
12. *Perception that we can accomplish everything today – self destruction - we are not in crisis mode – but it is difficult.*
13. *Would like more resources so that all areas of the building were properly looked after – at the moment they always get pushed to the back.*
14. *Downtime – waiting for third parties (welders, excavators, diggers)*
15. *Re-issuing same work package more than once*
16. *Too much paperwork*
17. *Engineering - Too many initiatives, lack of expertise, high turnover of staff (movement to other areas of the company)*
18. *Inaccurate Records - Geographical locations - Road expansions - Disconnect with records / old->new*
19. *Missing / and incorrect information in the 'envelope'*

POLICY & STRATEGY

1. *EHS collaborative across the company – scheduling training – how things work differently across the regions – desire for consistency across company*
2. *Management sometimes focus on the wrong things – not where the business priorities lie. Need better awareness of where the money is made in the business.*
3. *Finance group – understand the boundaries in Business development.*
4. *Micro managing the field work*

Answers to the Question

"If you could change just one thing at work, what would it be?

POLICY & STRATGEY *(continued)*

5. *People keep cards close to chest Business Development Opportunities – Customer relationships after the recent re-organisation should not reside within Finances.*
6. *Make field supervisors become 'closer' to the work*
7. *Workload planning should share accountability for the overall cost of doing the work*
8. *Make our work management and budget systems work together*
9. *Work Management - Lack of forecasting ability - Struggle with the amount of information required (e.g. M&R used to complete a 1 page document, now it is 8 required pages)*
10. *Gross underestimation of speed of system (eg 1 clerk used to be able to complete 175 builder orders per day and they are not completing 12)*
11. *Work mgmt office has too much control over functions which should belong in the field*
12. *Need an appropriate level of micro vs macro management of work*
13. *Field feels that they have lost some control in their work - The service fitters do not have as much data/information than they used to - They have stopped complaining about it though*
14. *Some confusion of the asset management role - We moved to an 'arms length' relationship with service providers - The 'pendulum' however, seems to be swinging back (good)*

PROCESSES

1. *Not have to worry about dotting the "i" or crossing the "t". A rigorous procedure – have confidence in our consistency of purpose and procedures.*
2. *Revamp all our manuals – so that they are cohesive – eliminate duplications and contradictions – field workers input 8 people – use a multidiscipline team*
3. *The change management process – there isn't one – we need focus on change management.*
4. *The change management process is excluded from risk – not thoroughly worked out.*
5. *Prioritisation of projects – we need to remain sensitive to ideas generated – growing the people's interest in coming up with ideas.*
6. *Scientific and financial rigor – apply what we learn – really see what we need and have sense of priority with a rationale behind it – order - logic*
7. *Concerned that things like records don't get put right and that things are sometimes 'quick fixed' but not properly followed up*
8. *Simplify the processes (e.g. reduce # compatible units, stop micro-managing)*

Answers to the Question

"If you could change just one thing at work, what would it be?

RESULTS

DATA CAPTURE & USAGE

1. *Need to get the right information – not collect useless information.*
2. *ENVISION – the concepts and vision good – delivered stress from an operating point of view. Based on providing a good Financial system – I don't know that the reports are okay yet. There is a work scheduling back-log that's linked to ENVISION and its getting worse.*
3. *We can't easily control changes to the system – it takes so long – I cant influence ENVISION and it has a big impact on Risk & Reward..*
4. *Envision – data warehouse – the grief of the staff – they need their sanity saving – pulling teeth just to get a project number – extremely frustrating*
5. *Concerns with Envision – the project has to be made to work.*
6. *Timing of the AM review may cause a distraction from Envision delivery.*
7. *Envision is pulling 33 legacy systems together into 1 work management system and asset register – not without it's problems.*
8. *Current perception is that collecting data is time consuming and receiving feedback that the value of the data is unclear.*
9. *Agreed that AM roadmap should aim to help by focusing on the useful and effective data – identify how it will be used to support decisions.*
10. *Lack of reports*
11. *Reward based on results*
12. *Need to understand what information is required to effectively run the business*
13. *Possible mis-alignment of performance metrics- Metrics may not be appropriate (eg complete the work, but not measure against the overall system performance)*
14. *We are measuring the wrong things (the Public Safety Reliability Index (PSRI) has been a step in the right direction – but only one aspect addresses leaks on the system; no corrosion metrics, for example)*
15. *IT too slow, permit turnaround – projects backing up – reporting from IT not there yet.*
16. *Objectives outside control – Gathering information for KPIs takes a lot of time.*
17. *Get Envision sorted and working – it is causing problems at the moment and workaround.*
18. *Envision – want it working to support the business, at the moment it is absorbing resource and not helping.*
19. *Know where and why (Envision) - Listen to field staff*
20. *Accurate financial and productivity reporting - Financial reporting moved from Consumers Gas to Enbridge to Envision (used to have more, and more accurate reporting)*
21. *Report on the 'simplified processes' – both productivity and financial reporting*
22. *Reduce the amount of effort required to populate the field records*

Answers to the Question

"If you could change just one thing at work, what would it be?

RESULTS

DATA CAPTURE & USAGE (*continued)*

23. Understand what data is required by the business (e.g. Operations, Engineering, Finance, etc.) in order to effectively manage the business

24. Accurate information on reports - Senior management find themselves compelled to act on the data from a due diligence perspective, regardless of data accuracy

25. *There is a disconnect in that the IT system is supposed to be a work enabler, but the experience is that it is a constraint*

SUMMARY OF ANSWERS & COMMENTS

Total comments = 136

- Leadership 47
- Communications 6
- People 19
- Resources (People & Time) 19
- Policy & Strategy 14
- Processes 8
- Results Data Capture 25

Enbridge Gas Distribution
Workshop INSTRUCTIONS

Objectives

Develop the priorities/objectives for the next 5 years to be built into the corporate roadmap.

Staged topics and consideration areas

1. DIAGNOSIS - Where are we now?
   - What are common problems, weaknesses and barriers that we face?
   - What good examples, successes and good practices do we already have in place to address this (and where are the best examples of each within the company)?
   - What is the business impact or priority for each of these areas (results already achieved by the successes, and value/potential impact of future improvements)?

2. OBJECTIVES - What are the business needs, priorities and role of asset management?
   - Define what the company should look like in 3-5 years time – what *symptoms of success* would you expect to see?
     a. Context, processes, coordination & control – *efficiency* areas
     b. Optimisation, sustainability, cost/benefit/risk management – *effectiveness* areas

3. REQUIREMENTS - What changes, resources, capabilities, tools & methods are needed to deliver this goal?
   a. What is the business impact, costs & timing priorities for each of these areas?
   b. Resources, capabilities, tools & methods – how do we make them happen?

4. DELIVERY - How do we plan, integrate and coordinate the requirements?
   a. Interdependencies & overlaps
   b. Project coordination and alignment
   c. Specific action plans & the overall roadmap

Instructions for 'Issues' (Stage 1 above)

For each Issue
Give a number (Group/serial) to each issue e.g. 1-1, 1-2, 1-3 etc
Review/refine/delete or add description (1-2 sentences that cover the area and manifestation)
Choose which band of impact ($/year risk, cost or improvement opportunity) it represents
Indicate in which area it lies (People, Process, Technology X PAS55 area affected)

Instructions for describing the '3-5 year goal' (Stage 2 above)

List specific 'symptoms of success' that you would recognise if, in 5 yrs time, AM was sorted, integrated and working

Indicate how you would measure or demonstrate achievement of each

Assemble these objectives into an overall goal for AM improvement (realistic target for 3-5 years)
Keep the description focussed on a) detectable results or outputs b) what is realistically achievable in processes, people, tools & content and c) max 60 words
- Think of the total company picture: customer requirements & system performance, all stakeholders

Impact scales

Action Costs	Points
<$100k	5
100k-1M	50
1-10M	500
>10M	2000

1 'point' = $10,000

Issues/Opportunity	Points
<$100k/yr	5
100-500k/yr	25
500k-5M/yr	250
5-20M/yr	1000
>20M/yr	5000

Current issues & opportunities

PAS 55	Issue no.	Bundle	Impact (cost band)	Area addressed (table below)	High level Issues description
TWPL groupings, edited by EMT					
		A	**1000**		The company is not yet fully compliant with the PAS 55 - what does this represent in lost opportunity?
		B	**250**		EGD is displaying good practice and, in some cases, best practice against the PAS55 - but they are patchy: what is the impact of spreading and exploiting such good practices?
		C	**10000**		EGD has a good culture of corporate responsibility, safety & high professional integrity - what would be the risk of damaging this by shifting priorities & attention?
		D	**incl in B**		KPIs in EGD are generally a success story, but there are opportunities to develop better asset focussed measures & to align priorities across departments. What would such AM specific KPI's enable?
		E	**250**		There are too many initiatives currently underway. This is causing difficulties in terms of resources, priority and stress on some individuals - what is the potential project delivery impact (timescales, benefits realised)?
		F	**1000**		The business planning process is not well integrated into normal activities – in particular capital planning could be improved. How much is that worth?
		G	**250**		Although the documentation is in place at a detailed level ('how'), clear statements on direction, policy and strategies for assets ('why') are not visible or commonly known. What risk does this represent in errors, regulatory/stakeholder accountability etc?
		H	**250**		Communication tends to be ad-hoc and functionally driven. The systematic communication of AM strategy & issues did not appear to be in evidence. What misunderstandings, duplications and missed opportunities might be resulting?
		I	**1000**		At present the collection of data and highly detailed scheduling of work is presenting a significant burden on EGD. What unnecessary costs and risk of data overload/confusion/decision error might be resulting?
		J	**25**		Training and succession management is inconsistent and not always aligned with either the strategic or business plans (esp at technical levels). What risk, knowledge loss and re-learning cost might this represent?
		K	**250**		The AM processes addressed in EnVision can be streamlined/improved (e.g. work scheduling, data accuracy, information flow). What is the overhead, misalignment and confusion likely to cost (direct and indirect impact)?
		L	**25**		Asset management concepts are understood within 'pockets' of EGD, although there is also confusion around what the term 'really means' and the implications of applying it within the company. What is worth spending to address the gaps?
Consolidated issues Groups 1 and 2					
4.1		1	250		Lack of a common understanding of AM and its value to EGD
4.2		2	250		Not clearly documented AM Policy and Strategy
4.3.6		3	1000		Need a long term AM plan using consistent prioritisation methodology and linked to budgeting of capital investments, risk management and strategic plan
4.2.2		4	150 - 250		People and culture need to support asset management through training, succession and effective communication. Resouces and distribute initiative burden
4.2.2		5	250		Not adequately aligned and integrated processes to collect appropriate data and put in place decision support techniques and tools
4.3.1		6	500		Remaining Envision issues regarding AM support and work management issues including process efficiencies and accountabilities

Specific component issues GROUP 1					
4.1	1	1	250	common understanding of AM and its value to EGD	Understanding of asset management requires clarification.
4.3.6	26	1		common understanding of AM and its value to EGD	There is not a well understood asset management planning process, and little evidence of the use of whole life costing and similar techniques.
4.4.1	34	1		common understanding of AM and its value to EGD	Perception at lower organisational levels that cross organisational issues not adequately considered or joined up. Compartmentalising of problems.
4.2.2	4	-			Micro management of fieldwork.
4.1	2	2	250	AM Policy and Strategy	**Develop a long term strategy around the maintenance & management of assets.**
4.2	3	2		AM Policy and Strategy	Manuals not linked to **AM** strategy.
4.3.1	7	6		Resolve Envision issues required for AM support	Lost productivity due to administering new IT systems (Envision).
4.3.2	20	2		AM Policy and Strategy	No clear mechanism to ensure resources to manage risk are built in to future plans.
4.3.1	9	6		Resolve Envision issues required for AM support	EnVision forecasting information not available.
4.3.4	22	2		AM Policy and Strategy	AM Objectives not visible – reactive rather than proactive
4.3.1	11	3	1000	Prioritisation and budgeting of capital investments	Make the work management systems and budget systems work together.
4.3.2	18	3		Prioritisation and budgeting of capital investments	Risk management is not clearly linked to business case for the majority of assets.
4.3.1	12	6		Resolve Envision issues required for AM support	EnVision impact on strategic alliance commercial interface has been a major problem – invoices very late, and asset information late and inaccurate. Revenue being lost due to late entry into billing system. Using estimated information for payment pending reconciliation – additional administrative overhead to manage system.
4.3.1	13	6		Resolve Envision issues required for AM support	Computers in vans – coding work takes too long, resulting in wasted administration time for front line staff and disputes about service quality (time to site).
4.3.1	14	6		Resolve Envision issues required for AM support	Benefits claimed as a result of efficiency are not considered credible.
4.3.1	15	-			Frustration from those working to make IT work that there is negative response, and it is being used as an excuse to cover other shortcomings – ‘is it showing up what was always wrong’.
4.3.2	19	3		Prioritisation and budgeting of capital investments	There are inconsistencies in the approach between asset types.
4.3.6	27	3		Prioritisation and budgeting of capital investments	Budgets come through on an annual basis – can’t see the long term.

4.2.2	6	4	250	Enable people and culture - training, succession, motivation	Generally reactive and compliant culture & business processes
4.3.1	10	4		Enable people and culture - training, succession, motivation	People don't understand IT systems – training needed.
4.3.3	21	4		Enable people and culture - training, succession, motivation	Accountability – Enbridge requiring all safety related issues to be reported via them, but TSSA require direct notification. Has this safety liability driven some QA checking now required by Enbridge?
4.3.4	23	4		Enable people and culture - training, succession, motivation	Cost is a major focus – some concerns that the customer is losing out.
4.4.1	37	4		Enable people and culture - training, succession, motivation	Multi-disciplined technicians are frustrated that the workload for Enbridge staff flexes around keeping the agreed level of work with contractors.
4.4.2	39	4		Enable people and culture - training, succession, motivation	Currently no training on AM tools and techniques, (includes whole life costing, optimisation techniques etc
4.4.2	40	4		Enable people and culture - training, succession, motivation	High proportion of skilled staff due to leave – inadequate succession plan. High turnover of young supervisors and managers moving on results in reliance on experienced technicians in some disciplines. There is a skill gap in some areas – e.g. welding. In some areas skilled staff are having to cover multiple skills, and there are severe resource limitations. The reduction in 'training posts' such as 'welders helper' mean that appropriately trained staff are not coming through.
4.3.5	25	-			Some scorecard measures are resulting in focus on individual gain, people fulfilling others objectives and inappropriate priority.
4.4.3	46	4		Enable people and culture - training, succession, motivation	Frustration in some quarters that progress appears to be resisted by union pressure.
4.6	56	4		Enable people and culture - training, succession, motivation	Change takes a long time to happen, too many people are involved and people don't want to make a decision.
4.3.6	28	-			Lost productivity waiting for 'dependencies' – welder, backhoe etc.
4.3.6	29				The complexity of planning work through the IT system is resulting in increased administration overheads and in practice many are working around it. Planning work is being administered by clerical staff and needs to be very accurately defined, it also takes a long time to enter work. The clerks are under stress and do not have sufficient technical knowledge to avoid errors.
4.4.5	47	5		Collect and use data to support decisions	Not clear how some information now collected is to be used, but it is time consuming to input it. Reports not seen as useful for driving the business. Some information needs to be collected at source – trying to put it on later using clerks results in errors.
4.2.2	5	5	250	Collect and use data to support decisions	There is little evidence of the systematic use of condition-information or risk management **to affect what we do** (except mains).
4.3.1	8	5		Collect and use data to support decisions	AM information not well co-ordinated or aligned. Entry of data inefficient.
4.3.2	16	5		Collect and use data to support decisions	Leak management could be improved. Better recording and monitoring of leaks – pro-active rather than reactive approach.
4.3.6	33				Don't know if the plan is delivered, or if it is cost effective – data is not collected/available – not seen as a priority.
4.3.2	17	5		Collect and use data to support decisions	Lack of understanding behind the derivation of some test procedures, and inconsistency.
4.4.1	35				Accountability and responsibility in planning work is becoming blurred. 'Supervisors not being allowed to supervise'.
4.4.1	36				Pre-inspection is contentious – the quality and timeliness seems to be suffering. Technicians would like to do their own; supervisors would like to have time to do it (frustrated by being diverted to initiatives & meetings).
4.3.5	24	5		Collect and use data to support decisions	Inadequate financial and productivity reporting, **customer service level reporting**, and little confidence in data. This is a major concern to managers – they are effectively 'flying blind'
4.4.2	38				"Half staff have less than 5 years experience – no structured training"
4.4.3	45	5		Collect and use data to support decisions	Frustration that feedback from the field does not seem to have been taken on board – e.g. EnVision, process maps.
4.4.5	49	5		Collect and use data to support decisions	Data is being lost from some legacy systems – not compatible with the replacement Envision system

4.4.2	41	6		Resolve Envision issues required for AM support	SDAs concerned that they lose staff to Enbridge once they are trained – Enbridge now not training gas fitters.
4.4.2	42	6		Resolve Envision issues required for AM support	Field trainers are reputed to be stretched and not able to meet commitments.
4.4.2	43				People taken out of line for initiatives don't always get brought back in to organisation well – deters some from getting involved.
4.4.2	44				Some concerns expressed (at senior level) that current compensation package may be falling behind market and thus not attract and retain staff.
?	NEW	6	500	Resolve Envision issues required for AM support	**EnVision not fully functional.**
4.3.6	30	6		Resolve Envision issues required for AM support	Centralised resource planning is not working out.
4.3.6	31	6		Resolve Envision issues required for AM support	Information flows – informing the contractor in advance that work is coming up to enable him to more efficiently meet appointment times.
4.4.5	48				Scorecards used with SDAs – problems with data quality, associated with data entry issues and the current work management process not aligning well with the IT.
4.3.6	32	6		Resolve Envision issues required for AM support	The construction contractors preferred way of matching work to skills is to match the crew to the work, whereas the scheduling process being rolled out assumes a fixed crew and tries to match the work to the crew.
4.4.6	50				Control of the work shifting from the front line & supervisors to the scheduler
4.4.6	51				Very little forward notice of upcoming work – continually in 'reactive' mode – loss of empowerment to field staff. Managers and supervisors feel removed from the planning and believe that the field staff should be better utilised.
4.5.1	52				QA is contentious. Between Enbridge and SDAs each claims the other side are not adding as they have better technical knowledge. Enbridge technicians believe that there is excessive in house QA. There appears to be overlapping and inconsistency of quality checking.
4.5.2	54				Call centre performance concerned some representatives – Enbridge's reputation at stake if information and service is not adequate.
4.5.1	53	6		Resolve Envision issues required for AM support	Quality of work is suffering as a result of workload in some areas
4.6	55	6		Resolve Envision issues required for AM support	Too many initiatives going on - focused on a limited number of staff

Specific component issues GROUP 2					
4.1	1	4	150	Communication/Training on Asset Management	Understanding of asset management requires clarification
4.1	2	8		Long Term Asset Plan	Concern that a long term vision of the policy & management of assets has not been apparent.
4.2	3	7	50	Asset Policies & Procedures	
4.2.2	4	1		Work Management	Micro management of fieldwork
4.2.2	5	2		Data and How to Use it	There is little evidence of the systematic use of condition information or risk management (except mains).
4.2.2	6	3		Culture Change/Human Performance	Generally reactive and compliant culture & business processes
4.3.1	7	1		Work Management	Lost productivity due to administering new IT systems.
4.3.1	8	1		Work Management	AM information not well co-ordinated or aligned. Entry of data inefficient.
4.3.1	9	2		Data and How to Use it	Forecasting information not available.
4.3.1	10	4	150	Communication/Training on Asset Management	People don't understand IT systems – training needed.
4.3.1	11	5		System Integration & Performance	Make the work management systems and budget systems work together.
4.3.1	12	5		System Integration & Performance	EnVision impact on strategic alliance commercial interface has been a major problem – invoices very late, and asset information late and inaccurate. Revenue being lost due to late entry into billing system. Using estimated information for payment pending reconciliation – additional administrative overhead to manage system.
4.3.1	13	5		System Integration & Performance	Computers in vans – coding work takes too long, resulting in wasted administration time for front line staff and disputes about service quality (time to site).
4.3.1	14	6		Credibility, Image, Accountabity	Benefits claimed as a result of efficiency are not considered credible.
4.3.1	15	3		Culture Change/Human Performance	Frustration from those working to make IT work that there is negative response, and it is being used as an excuse to cover other shortcomings – 'is it showing up what was always wrong'.
4.3.2	16	2		Data and How to Use it	Leak management could be improved. Better recording and monitoring of leaks – pro-active rather than reactive approach.
4.3.2	17	7	50	Asset Policies & Procedures	Lack of understanding behind the derivation of some test procedures, and inconsistency.
4.3.2	18	8		Long Term Asset Plan	Risk management is not clearly linked to business case for the majority of assets.
4.3.2	19	7	50	Asset Policies & Procedures	There are inconsistencies in the approach between asset types.
4.3.2	20	9		Resource Allocation and Prioritization	No clear mechanism to ensure resources to manage risk are built in to future plans.
4.3.3	21	7	50	Asset Policies & Procedures	Accountability – Enbridge requiring all safety related issues to be reported via them, but TSSA require direct notification. Has this safety liability driven some QA checking now required by Enbridge?
4.3.4	22	8		Long Term Asset Plan	AM Objectives not visible – reactive rather than proactive
4.3.4	23	6		Credibility, Image, Accountabity	Cost is a major focus – some concerns that the customer is losing out.
4.3.5	24	2		Data and How to Use it	Inadequate financial and productivity reporting, and little confidence in data. This is a major concern to managers – they are effectively 'flying blind'
4.3.5	25	9		Resource Allocation and Prioritization	Some scorecard measures are resulting in focus on individual gain, people fulfilling others objectives and inappropriate priority.
4.3.6	26	8		Long Term Asset Plan	There is not a well understood asset management planning process, and little evidence of the use of whole life costing and similar techniques.
4.3.6	27	8		Long Term Asset Plan	Budgets come through on an annual basis – can't see the long term.
4.3.6	28	1		Work Management	Lost productivity waiting for 'dependencies' – welder, backhoe etc.

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4.3.6	33	2		Data and How to Use it	Don't know if the plan is delivered, or if it is cost effective – data is not collected/available – not seen as a priority.
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4.4.2	39	4	150	Communication/Training on Asset Management	Currently no training on AM tools and techniques, (includes whole life costing, optimisation techniques etc
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4.4.2	43	6		Credibility, Image, Accountabity	People taken out of line for initiatives don't always get brought back in to organisation well – deters some from getting involved.
4.4.2	44	4	150	Communication/Training on Asset Management	Some concerns expressed (at senior level) that current compensation package may be falling behind market and thus not attract and retain staff.
4.4.3	45	6		Credibility, Image, Accountabity	Frustration that feedback from the field does not seem to have been taken on board – e.g. EnVision, process maps.
4.4.3	46	3		Culture Change/Human Performance	Frustration in some quarters that progress appears to be resisted by union pressure.
4.4.5	47	2		Data and How to Use it	Not clear how some information now collected is to be used, but it is time consuming to input it. Reports not seen as useful for driving the business. Some information needs to be collected at source – trying to put it on later using clerks results in errors.
4.4.5	48	2		Data and How to Use it	Scorecards used with SDAs – problems with data quality, associated with data entry issues and the current work management process not aligning well with the IT.
4.4.5	49	5		System Integration & Performance	Data is being lost from some legacy systems – not compatible with the replacement Envision system
4.4.6	50	1		Work Management	Control of the work shifting from the front line & supervisors to the scheduler
4.4.6	51	1		Work Management	Very little forward notice of upcoming work – continually in 'reactive' mode – loss of empowerment to field staff. Managers and supervisors feel removed from the planning and believe that the field staff should be better utilised.

4.5.1	52	6		Credibility, Image, Accountabity	QA is contentious. Between Enbridge and SDAs each claims the other side are not adding as they have better technical knowledge. Enbridge technicians believe that there is excessive in house QA. There appears to be overlapping and inconsistency of quality checking.
4.5.1	53	9		Resource Allocation and Prioritization	Quality of work is suffering as a result of workload in some areas
4.5.2	54	6		Credibility, Image, Accountabity	Call centre performance concerned some representatives – Enbridge's reputation at stake if information and service is not adequate.
4.6	55	9		Resource Allocation and Prioritization	Too many initiatives going on - focused on a limited number of staff
4.6	56	3		Culture Change/Human Performance	Change takes a long time to happen, too many people are involved and people don't want to make a decision.
4.6	57	2		Data and How to Use it	Continuous improvement using information does not happen systematically.

PAS	Asset Mgmt Process	Processes	People	Technology
4.1	General Requirements		1	
4.2	AM Policy and Strategy	2		
4.3.1	AM Information Systems	6		6
4.3.2	Risk identification, assessment and control	3,5		3,5
4.3.3	Legal, Regulatory & Statutory			
4.3.4	AM Objectives			
4.3.5	Asset performance and condition targets			
4.3.6	AM Plans	3		5
4.4.1	Structure, authority and responsibilities for AM		4	
4.4.2	Training Awareness & Competence		4	
4.4.3	Consultation and communication		4	
4.4.4	Documentation	2		
4.4.6	Operational control		4	5
4.5	Checking & Corrective Action		4	
4.5.1	Performance and condition monitoring	6	4	5
4.5.2	Failures, incidents and responses	6	4	6
4.6	Management Review & Continual Improvement		4,5	5,6

Participants

Presenters

John Woodhouse & Peter Jay	The Woodhouse Partnership

Name	**Department/area**	
Team	**Name/department**	
Group 1	Faisal Ahmad, Finance	
	Chris Moore, Engineering	
	Jon Mok, Engineering	
	Catherine McCowan, Operations	Day 1 only
	Rob Fennell, Operations	
	Sagar Kanchala, Finance	
	Cindy Graham, Engineering	
Group 2	John Kordan, Engineering	
	Greg Fabbruzzo, Operations	
	Carolyn Teehan, Engineering	
	Jim Tweedie, Operations	
	Rocco Riccio, Engineering	
	Nick Thalassinos, Operations	
	Bill Ross, Finance	
	Lisa Lawler, Operations	

3 - 5 year objective for Asset Management	Demonstrated by…

EDG Strategic Objective #2: A leader in utility asset management
> Ensure we have the people, processes & systems in place to provide for the long-term sustainability of our assets
> Continue to seek efficiencies with service partners while contracting for long term sustainability of service levels and our assets
> Prioritize investment to maximize the long term health and wealth of the asset porfolio

What is the realistic mission & goals for asset management within the next 3-5 Years ?		Critical success indicators
FINAL	**EGD aims to be recognised by its customers, regulators, shareholders, employees and peer organisations as excellent in the asset management, providing a cost-, risk- and performance-optimised, and sustainable, gas distribution system.** It will achieve this through the establishment of an asset management culture and by successfully implementing and applying appropriate AM processes and methods (such as risk based decision techniques, continuous improvement, whole life costing and planning, appropriate competencies and multi-disciplined teamworking). Regardless of the Regulatory regime, AM will allow us to better justify to the Regulator a more robust and defensible process for all of our expenditures, which will result in bottom line improvements in financial performance and risk management.	1. AM specific basket of KPI's in total scorecard (reliability, integrity, ROE, LCcost per customer, TSSA orders, PSRI & ratios), 2. Hosting AGA Asset Management Best Practice Workshop (2009), 3. Regulatory review - effort reduction & final decision 4. Demonstrable VP support (signed mandates & active participation in steering), 5. PAS55 certification 6. Survey results of customer and staff perception of Enbridge AM performance
Individual Team versions		
EMT	**EGD aims to be recognised as a leading (top 5%) utility asset management organisation - which involves:** 1. Adopting (& consistent, successful application of) appropriate AM tools & processes *(e.g. AM life cycle planning, investment prioritisation & justification, asset care & resource optimisation)*. 2. Developed AM workforce understanding, competencies, culture, 'ownership' and alignment 3. Active exploration and persuit of business opportunities with regulatory interface, customers & shareholders *(e.g. regulatory relationship, new acquisitions)* 4. Delivery of significant bottom line improvements in both financial and risk performance	**Input measures:** 1. AM tools & processes usage 3. Regulatory review - effort reduction & final decision **Output measures**: 2. Employee survey & competencies audit 4. Scorecard KPI's **Overall:** PAS55 certification, benchmarking results

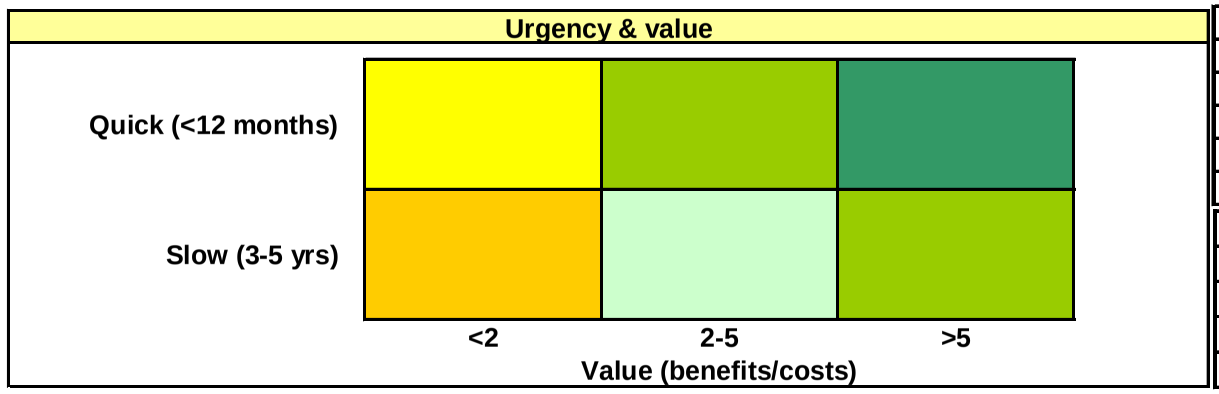
Group 1	**EGD aims to provide a safe, reliable, and economically optimised distribution system for its customers, regulators, shareholders and employees**. This will be delivered by an integrated effort from engineering, operations and finance, supported by HR, IT, Regulatory and Legal departments and the implementation/exploitation of EnVision, ERM, DMS and appropriate decision support systems. Achievement will be monitored by a calibrated scorecard system including Asset Management progress.	1.By indicies and ratios (reliability, integrity, and spending), 2.Hosting AGA Asset Management Best Practice Workshop (2009), 3.Transferring the AM competences to other Enbridge companies, 4.Customer & employee satisfaction surveys, 5.Return on equity, 6.Total cost of managing the regulator relationship, 7.Demonstrable VP support (signed mandates & active participation in steering), 8.Common, linked and calibrated scorecard measures, 9.Regulatory design of PBR, 10.IT support of decision tools
Group 2	**EDG aims to be best in class in the optimization of assets on behalf of shareholders, customers, the regulators and employees**. It will achieve this by implementing a constructive asset management discipline using an engaged and motivated workforce, competent in asset management and supported by strong leadership. This will deliver sustainable improvements in safety, reliability and stakeholder value. -	1. best in class life cycle cost of assets 2. demonstrated and consistent year over year optimization of cost/risk/performance 3. motivated workforce that understands their role in the overall management of the company's asset base 4. flexibility to respond and influence changes to regulatory environment (approach from position of knowledge) 5. positive relationship with external stakeholders

Component objectives (symptoms of success) listed to arrive at the above mission		Measured/demonstrated by	Notes & assumptions
EMT1	+200 points earnings above traditional cost of service	Points earnings	
EMT2	Significant risk reduction	*How much?*	
EMT3	At least one example of EGD AM model successfully applied to another utility as part of acquisition programme	Case study	
EMT4	Clear understanding of decision impact on assets and earnings (understood at grassroots levels.)	Employee survey?	
EMT5	Regulator measures EGD against PAS55-type standard	OEB requirement	
EMT6	Customer satisfaction targets met and exceeded	*How much?*	
EMT7	Regulatory acceptance of AM concept & EGD's approach to AM	OEB 'gaming' reduction and final decision (how much?)	
EMT8	Use, and publication, of transparent AM KPI's	Published KPI's	
EMT9	AM policies integrated into day-to-day resourcing	Audit	
EMT10	Bottom line savings in Capital and O&M	Budget reductions	
EMT11	Usage of AM tools at all levels of organisation	Usage measures	
EMT12	Recognised by peers as 'best in class'	Benchmarking	
EMT13	Audit trail to document compliance	*How?*	
EMT14	Rationalization of data collection, information & knowledge management	*How?*	
EMT15	Less reactive work (& fewer failures) - better budgetting, resource/work planning	*How measure & how much?*	
EMT16	Demonstrable, systematic & consistent AM decision-making	*How measure & how much?*	
EMT17	Have a list of top critical assets based on a common measure	List available	
EMT18	AM strategies (incl. maintenance & inspection costs and frequencies) & resources assigned proportionally to asset criticality	AM strategy audits	
EMT19	Asset life cycle costs quantified at design stage & monitorable at all life cycle stages	Asset LCC figures in investment appraisal & part of financial system	
EMT20	AM goals and practices understood at feld worker level and applied as a normal	Audit	
EMT21	Overall measure of asset health, distribution integrity & management system accepted by regulator	OEB 'gaming' reduction and final decision (how much?)	
EMT22	Understand financial impact of all investments, prioritised on common, directly comparable basis (>90% of cases) with 25 year investment plans based on asset criticality and performance	Plan visibility & individual investment cases transparency	
EMT23	Can optimise O&M and Capital across different kinds of projects (e.g. expansion, repairs, replacements)	*How measure & how much?*	

Group 1			
1-1	Satisfied customers	Value of service for the customer	
		Commitments met	
		Service standards	
1-2	Able to invest in assets at an appropriate level to ensure the asset's sustainability	Reliability or integrity measure: e.g. increased PSR	
1-3	Asset decisions easily defensible supported by data and analysis	Shorter hearings	
1-4	Understanding and acceptance of asset decisions by regulator and company employees (transparency)	Increased ROI, increased employee satisfaction	
1-5	Optimised and prioritized capital budget decisions with consideration of non-financial implications (safety, environment, public image, risk…)	A common and consistent ranking measures, safety & reliability index,	
1-6	Move to proactive, away from reactive, maintenance	reduced reactive maintenance	Under incentive regulation
1-7	People feel like their time is being spent wisely	Improved employee satisfaction	
1-8	Long range capital plan for renewing all types of plant: 25 years! (demonstratible)	The Plan	
1-9	Managing leaks appropriately through replacement, repair, or monitoring	PSRI	
1-10	A well oiled asset management machine	"move to above area?"	
1-11	Cross-functional departments working together	Common KPI in common elements	
1-12	Knowledge of the criticality (operations & financial risk, value) of all of our assets	Assets are ranked accordingly.	
1-13	Inspection and maintenance intervals are based on criticality (more of it for critical stuff, less for low critical stuff)	100% reviewed at appropriate level of detail (top 10% quantitative)?	
1-14	Service quality indicators incorporated into PBR framework	In the framework	
1-15	Budget driven more by work needed to be done, from the bottom up	60% of spend is derived this way	need baseline
1-16	**NB need to add measure of relationship with technical regulator too**		

Group 2			
2-1	union that is supportive of asset mgmt direction and buys into business objectives	have asset management related objectives on all employees, including individual unionized employees	
2-2	long term capital and operating plan for both improvement and growth	10 year plan in place, updated annually	
2-3	repair/replace decision making tool for day-to-day use - based on decision criticality [usage and/or asset condition/performance] (quantitative, not subjective)	tool in place and used in due circumstance; implies clarity of understanding of when to use	
2-4	lower life cycle cost of plant / lower cost of ownership	improved financial performance	
2-5	understanding of asset health - year over year benchmark	asset health register document, ease of access to asset information (and timely)	need to know how 'uneasy' it is today (baseline)
2-6	lower operational risk exposure	optimized PSRI (public safety and reliability index)	
2-7	regulator has accepted the asset mgmt methodology as a means to manage the utility's asset base	faster regulatory process; reduced cost of dealing with regulator; higher success rate on issues	need to know baseline
2-8	understanding of asset criticality and design of condition and risk based programs based on asset criticality and risk/cost optimization;	demonstratable model and compliance with asset strategy; availability of ranked asset criticality; resources proportioned to asset criticality	
2-9	work and asset information, right people, right time / collect / store / provide information	data accurancy required demonstrably proportional to cost of acquisition and usage criticality	
2-10	establish asset management competence in house and are in a position to demonstrate this competence externally	industry recognition; improved quality re-work	need to understand the baseline
2-11	improved employee morale/satisfaction - engaged employees understanding their role in the management of the company's assets	10% improvement on employee survey results (3 year average)	
2-12	**NB need to add in 'encouraged good behaviours'**		

Action plans



Issues/Opportunity	Points
<$100k/yr	5
100-500k/yr	25
500k-5M/yr	250
5-20M/yr	1000
>20M/yr	5000

Action Costs	Points
<$100k	5
100k-1M	50
1-10M	500
>10M	2000

Action no.	Commitments or required actions	Issue(s) & goal(s) addressed	Responsible	Opportunity (benefit)	Likely cost	Value (benefit/ cost)	Timing
A	AM roadmap development			5	50	0.1	QUICK
B	Envision			5000	2000	2.5	SLOW
C	SDA			600	50	12	SLOW
D	DMS			25	50	0.5	SLOW
E	Integrity Mgmt			250	50	5	SLOW
F	Records integrity & accessibility			250	500	0.5	SLOW
G	Ops/ Technician			25	50	0.5	SLOW
H	Employee Workforce Model			5	5	1	SLOW
I	Customer care efficiencies						
J	Use of balanced scorecard with partners						
K	Financial assessment tools (AM decisions)			250	50	5	SLOW
L	Asset risk assessment & investment plans			250	50	5	SLOW
M	Accelerate cast iron replacements			1000	2000	0.5	SLOW

	New specific AM actions needed						
1	**Management of initiatives**			SHOULD			
	Set up / adapt Program board (cross functional)						**QUICK**
	Assign accountabilities for performance of						**QUICK**
	Co-ordinated plan						**SLOW**
2	Policy & strategy statements (asset types)			SHOULD DO			
	Overall Asset Mgmt Policy Defintion						**QUICK**
	Approach for individual asset groupings based on						**QUICK**
	Develop into regulatory strategy						**SLOW**
	Collation of asset health, criticality into strategy docs						**SLOW**
	Adopt policy and stategy into manuals,						**SLOW**
	Communication, integration						
3	Asset Health Review			MUST DO			**QUICK**
	Attribute Design						**QUICK**
	Collect Data						**QUICK**
	Pilot Study to ensure buy-in						**QUICK**
	Process defined - integrated to AM						**SLOW**
	Implementation - first cut to establish baseline						**QUICK**
	Implementation - systematic, fuller depth						**SLOW**
	Ongoing update						**SLOW**
4	Capital planning			MUST DO			
	Process defined to link to strategic plan, asset health & criticality, system growth requirements						**QUICK**
	Develop renewal strategy - split into asset type						**SLOW**
	Framework/process/tool to prioritize capex using						**QUICK/SLOW**
	Develop first 25 year LRP						**SLOW**
	Implement whole life costing methodologies (incl tools - design, prove, rollout)						**SLOW**
	Build into budget						**SLOW**
	Communicate budget development						**SLOW**
	Post-implementation Review of Actual						**SLOW**

5	Criticality - asset level				SHOULD			**QUICK**
	Scope & Categories							**QUICK**
	Methodology agreed, sign on to assumptions							**QUICK**
	Pilot Study to adjust criticality calibrations							**QUICK**
	High level initial application							
	More detailed, data-driven rollout							**SLOW**
6	AM Process alignment				SHOULD			
	Map critical asset processes							**QUICK**
	Cross functional accountabilities established through shared KPI's							**QUICK**
	Process to identify issues (QA), assign accountability for correction and establish new performance metrics							**SLOW**
	Develop new methods and processes necessary for asset management decision support(design, piloting, implementing)							**QUICK/SLOW**
7	Change Management Plan				MUST DO			
	Obtain Leadership Commitment and Accountability (1 to 1's coaching, mentoring, education							**QUICK**
	Communication Plan							**QUICK**
	Identification of champions & deliverers							**QUICK**
	Roadshow and engagement exercises							**QUICK/SLOW**
	Reward positive behaviours							**QUICK/SLOW**
	Advertise successes!							**QUICK/SLOW**

8	Maintenance review				MUST DO			
	Design methods to link maintenance to asset health review, criticality							**QUICK**
	Implement appropriate tools/methods (select, trial, embed) - risk based							**SLOW**
	Assign accountabilities for decision-making and implementation activities							**SLOW**
	Optimize maintenance practices (pilot, rollout high level criticals, rollout lower levels batch studies)							**SLOW**
	Incorporate new maintenance strategies into budget processes, work management processes, resourcing & planning, communication, monitoring)							**SLOW**
	Ongoing review of maintenance applicability							**SLOW**
9	Asset Management Competency				SHOULD DO			
	Define competency needs							**QUICK**
	Baseline competency & gaps assessment							**QUICK**
	Training / Hiring							**SLOW**
10	Resource planning				SHOULD			
	Technical skills succession planning							**SLOW**
	Total resource requirements & constraints analysis (all initiatives)							**SLOW**
11	Design of Metrics		S. Kancharla		MUST DO			
	Choose appropriate KPIs and scorecard							
	Design tools to capture requisite information for KPI's				MUST DO			**SLOW**
	Identify data requirements, determine source & reporting processes							**QUICK/SLOW**

Mission Objectives	Action Items	Priority
Stakeholder recognition	Involve TSSA & OEB at early stages to be able to realize benefits	
	Identify needed tools & processes	Must
	i.e. FMEA, Risk data…	
Cost/Risk/Performance Opti	Life Cycle Costing	Must
	Create team	
	Define accountabilities, Define method for prioritizing assets	
	Identify areas where LCC would be considered, and distribute	
	Define capital prioritization model	Must
	Identify implications of data, Develop methodogly for using it	
	Setup Operations, Engineering, Finance task group to idenitfy	
	Identify needed tools	
	Baseline current capital budget	
	Finalize model	
	Get Regulatory approval	
	Define boundaries of asset management for EGD	
	Collect data to identify critical assets and what to do about them	Must
	Define data, and its criticality for what purposes (including failure mechanisms)	
	Develop appropriate mechanism for data collection	
	Communicate/Train appropriate people in collection	
	Define accountabilities to ensure proper data is collected	
	Analyze the data	Must
System sustainability	Development of condition monitoring progam	Must

Develop AM culture	**Communicate the "why" and encourage dialogue**	**High**
	Communicate the context of Asset Management, and its benefits to stakeholders	**High**
	Recognize employees who contribute AM success	**Med**
	Evaluate roles, responsibilities, and job descriptions in light of the needs for project allocation	**Potential**
Applying AM tools/methods	use group 2's inputs	
Demonstable VP support	**Develop appropriate scorecard measurements**	
	Aligned (departmental) scorecard measure	
	Obtain VP endorsement of links between strategic objective #2 and the AM goals and roadmap	
Peer awareness	**Introduce AM to AGA in 2006**	

UNDERTAKING JT1.7

UNDERTAKING

TR 1, page 65

To ask Woodhouse to provide further explanation for Exhibit I, Issue B2, Schedule 4.4, Attachment 1, Page 8 of 14, Section 5.1, Item 6, In Woodhouse Report.

RESPONSE

To respond to this question, Enbridge contacted both John Woodhouse, the principal of the Woodhouse Partnership, and Peter Jay, the lead Woodhouse consultant on the Enbridge Gas Distribution engagement in 2005. Both of these individuals confirmed that the application of Asset Management concepts, in addition to providing benefits for a utility's ongoing operations, could also assist with assessing corporate opportunities, such as acquisitions. Mr. Woodhouse and Mr. Jay confirmed to Enbridge that they were not aware of any specific acquisition that Enbridge Gas Distribution was considering at the time that the report was prepared (in 2005). The reference was intended to highlight a more general potential benefit of an Asset Management programme.

Witness: L. Chiotti

UNDERTAKING JT1.9

UNDERTAKING

TR 1, page 74

To determine the impact in the 2013 Test Year working cash derivation of changing the forecast storage net lag cost back to the 2007 Board-Approved.

RESPONSE

The impact of the storage cost net lag day going from 52.9 last approved in 2007 to the 62.5 included within Impact Statement #1, is a $0.3 million increase in the working cash allowance within the rate base shown in Exhibit M1, Tab 1, Schedule 3, page 3, Column 3. EGD has attached a copy of the exhibit referenced above, with the storage cost net lag day changed to the 2007 Board Approved day. The impact to the revenue requirement in 2013 is less than $30,000.

The lag day changed mostly as a result of timing changes of payment of labour, supplies and other general expenses.

Witness: K. Culbert

WORKING CAPITAL COMPONENTS - WORKING CASH ALLOWANCE
2013 TEST YEAR

Line No.		Col. 1 Disbursements ($Millions)	Col. 2 Net Lag-Days (Days)	Col. 3 Allowance ($Millions)
1.	Gas purchase and storage and transportation charges	1,316.5	4.0	14.4
2.	Items not subject to working cash allowance (Note 1)	(8.6)		
3.	Gas costs charged to operations	1,307.9		
4.	Operation and Maintenance	348.7		
5.	Less: Storage costs	(7.9)		
6.	Operation and maintenance costs subject to working cash	340.8		
7.	Ancillary customer services	-		
8.		340.8	(18.7)	(17.5)
9.	Sub-total			(3.1)
10.	Storage costs	7.9	52.9 2007 Approved	1.1
11.	Storage municipal and capital taxes	2.2	24.4	0.1
12.	Sub-total			1.2
13.	Harmonized Sales Tax			1.8
14.	Total working cash allowance			(0.1)

Note 1: Represents non cash items such as amortization of deferred charges, accounting adjustments and the T-service capacity credit.

UNDERTAKING JT1.10

UNDERTAKING

TR 1, page 76

To produce online version of Union's current priority of service schedule.

RESPONSE

From Union Gas Website:
http://www.uniongas.com/storagetransportation/infopostings/POS.asp

POLICIES & GUIDELINES

Policy #: 07-CM-POS-015

Subject: Priority of Service (POS) Guidelines

Effective: December 7, 2007

Applies to: Applied on a daily basis to services for both in-franchise and ex-franchise customers in Union Gas' Southern, and Northern and Eastern Operations area.

Purpose: To prioritize scheduling reductions and service restrictions for Union's services during periods when Union's ability to flow interruptible gas quantities is less than the requested/forecasted quantities.

Background: (Not to limit the applicability of the policy)

Union offers firm no-notice (allocated) services, firm nominated services and interruptible services. The priority of service listings provide information regarding the processing of interruptions or scheduling reductions when requested services exceed available capacity under normal operating conditions.

Firm no-notice services are not interruptible. Firm nominated services are only firm if requested on the North American Energy Standard Board (NAESB) Timely Nomination Cycle for the gas day in question. Nominations for increases to daily quantities for Firm Services after the NAESB Timely Nomination Cycle are treated the same as interruptible services. Because Union is a non-bumping pipeline, interruptible services scheduled on the NAESB

Witness: J. Sanders

Timely Nomination Cycle will not be interrupted to make room for additional firm services nominated on later nomination cycles.

In order to place services on the priority of service list, Union considered several business principles. The principles included: appropriate level of access to core services; customer commitment; encouraging appropriate contracting; materiality; price and term; and promoting and enabling in-franchise consumption.

Policy:

The priority ranking for all services utilizing Union Gas' storage, transmission and distribution system as applied to both in-franchise and ex-franchise services are as follows; with number 1 having the highest priority and the last interrupted.

Priority for STORAGE Services

1. Firm In-franchise Storage and Distribution services and firm Ex-Franchise services (1)

2. In-franchise Interruptible Distribution storage services

3. Peak Storage above firm up to 5% maximum storage balance (MSB) (2)

4. Balancing (Hub Activity) <= 100 GJ/d; Balancing (Direct Purchase) <= 500 GJ/d (3)

5. Off Peak Storage (First Cycle) up to 5%; Long Term Storage up to 5% MSB (2)

6. Peak Storage and Off Peak (First Cycle) above 5% MSB & Loans; In-franchise storage authorized overrun

7. Peak Storage and Off Peak (Second Cycle); Long Term Storage above 5% MSB

8. Balancing (Direct Purchase) > 500 GJ/d

9. Balancing (Hub Activity) > 100 GJ/d

10. Late Nominations

Priority for TRANSPORT Services

1. Firm In-franchise Transportation and Distribution services and firm Ex-franchise services (1)

2. In-franchise Interruptible Distribution services

3. C1/M12 IT Transport and IT Exchanges with Take or Pay rates

4. Balancing (Hub Activity) <= 100 GJ/d; Balancing (Direct Purchase) <= 500 GJ/d; In-franchise distribution authorized overrun (3)

5. C1/M12 IT Transport and IT Exchanges at premium rates

6. C1/M12 Overrun <= 20% of CD (4)

7. Balancing (Direct Purchase) > 500 GJ/d

8. Balancing (Hub Activity) > 100 GJ/d; C1/M12 IT Transport and IT Exchanges

9. C1/M12 Overrun > 20% of CD

10. C1/M12 IT Transport and IT Exchanges at a discount

11. Late Nominations

Notes:

(1) Nominated services must be nominated on the NAESB Timely Nomination Cycle otherwise they are considered to be a late nomination and are therefore interruptible.

(2) Higher value or more reliable IT is contemplated in the service and contract, when purchased at market competitive prices.

(3) Captures the majority of customers that use Direct Purchase balancing transactions.

(4) Captures the majority of customers that use overrun.

Procedures

1. Union Gas will use its daily gas scheduling process to forecast the impact of firm and interruptible and/or discretionary customer activities on its storage, transmission and distribution operations.

2. Customer requested and/or forecasted quantities are compared to Union Gas' operational limitations to determine if scheduling reductions and/or service restrictions are required. Any constraints are identified in advance of the effective flow time.

3. The Priority of Service list applicable to the operational constraint is used to make reductions to the customer's requested and/or forecasted quantities to a level sufficient to alleviate the constraint. Pro-rata reductions are performed within each priority ranking when necessary.

4. Customers are notified of an operational constraint and the corresponding impact on their requested and/or forecasted activities. All notifications occur in advance of the effective flow time.

5. Customer must re-nominate, as necessary, to balance any scheduling reductions and/or service restrictions.

6. As interruptions of specific services have ended the processing of authorized transactions will resume. The customer will be notified by phone and/or Unionline that their authorization will resume.

View PDF of the Priority of Service Policy.

If you have any questions regarding the Nomination Table please contact your Account Manager.

UNDERTAKING JT1.11

UNDERTAKING

TR 1, page 86

To provide response as to what budget item on line 15 is of D1, Tab 3, Schedule 1, page 4 of 29, and why it is increasing.

RESPONSE

This type of cost is related to claims and charges from third parties to the Company for the damages the Company has made to the third party. There is an immaterial increase of 62K from the 2012 Estimate to the 2013 Budget for Claims, Damages and Legal fees on Line 5.

Witnesses: J. Alton
J. Briggs
K. Culbert
M. Torriano

UNDERTAKING JT1.13

UNDERTAKING

TR 1, page 104

With reference to Gannett Fleming Report, at Exhibit D2, Tab 2, Schedule 1, page 60 of 158, to explain duration and amount of doubling up in measurement and regulation inspectors category.

RESPONSE

Please note the reference to the Gannett Fleming evidence is incorrect, the undertaking relates to Exhibit I, Issue D1, Schedule 1.15, page 2, under the second table regarding FTEs for measurement and regulation inspectors in 2013 and 2012.

The Company identified ten new measurement and regulation inspectors for 2012 and five for 2013. Of the 15 total new inspectors, six are for succession planning and nine are for growth and integrity work.

The planned duration of “doubling up” is approximately 2 to 3 years, depending on the candidate’s background and how quickly they develop skills. The level of growth and integrity activity will determine the need to replace retirements as they occur.

Witnesses: J. Alton
J. Briggs
K. Culbert
M. Torriano

UNDERTAKING JT1.14

UNDERTAKING

TR 1, page 106

With reference to Gannett Fleming report, at Exhibit D2, Tab 2, Schedule 1, page 59 of 158, to explain table and curves, and whether 40-year life is still appropriate.

RESPONSE

The chart at page III-19 of the Gannett Fleming report provides a graphic representation of the percentages of original costs surviving at each age interval related to the plant in Account 473.00 – Services. The percentage surviving at each age interval is calculated in the tables at pages III-20 through III-22. A detailed description of the calculations developed in the table is presented at pages III-20 through III-22 is presented in the Gannett Fleming report at pages II-3 through II-17. The process for fitting a smoothed IOWA curve is also presented in the Gannett Fleming report at pages II-17 through III-24.

The factors considered by Gannett Fleming in the development of the recommendations were described in the Gannett Fleming report at pages II-25 though II-27 (related to Account 473 – Services); pages II-27 through II-28 (related to the Account 475.3- Plastic Mains); and were further described in response to APPRO Interrogatory #1. In order to be responsive to the issues raised by APPRO in the Technical Conference setting up the request for this undertaking, Gannett Fleming has been asked by Enbridge to further describe the process to develop the recommendations related to Accounts 473 and 475.

Gannett Fleming Comments related to Account 473 - Services

As noted by APPRO at the Technical Conference, the services and mains accounts have a long history of varying pipe types. As indicated in the tables II-20 through II-22 of the Gannett Fleming report, the vintages of installations from 1884 through 2010 were considered in the analysis (the Placement Band), however, only the actual retirement transactions from 1956 through 2010 were considered (the Experience Band). Overall, over $310 Million of retirements were considered in the analysis, with over $131 Million of the retirement experience related to pipe installed in the years 1980 through 2010. In other words, 42% of the specific retirement activity analyzed related to pipe of a type that represents the technology comprising the majority of assets currently in service. As such, the retirement rate analysis does specifically deal with the significant level of retirements of pipe vintages where the newer generations of plastic

pipes have been installed. Gannett Fleming also notes, that as described in the response to APPRO Interrogatory #1 (Exhibit I, Issue D7, Schedule 2.1), retirement due to age and condition, is only one of the causes of retirement. There also exist a number of additional forces of retirement such as:

- Capacity of the service line;
- Re-routing of the service line to meet changes to the customer use of the land;
- Re-routing of the service line to accommodate outside pressure regulation and metering equipment (move from inside); and
- Retirement of the service due to discontinuation of service to the customer.

Each of these types of retirements will re-occur and are not dependent on the composition of the pipe material. When it considered that the retirement activity analyzed included approximately 42% of its activity from installations from over the past 30 years, combined with the fact that many of the forces of retirement are related to activities that will re-occur regardless of pipe type, the retirement rate of analysis does provide for a meaningful source of information to be considered.

Also as noted in the Gannett Fleming report, the retirement rate analysis does provide for only one piece of the total package of information that needs to be reviewed. The approved service life estimates of peer companies as described at page II-26 should be reviewed. Additionally the information as learned from the interviews with internal Enbridge operating, engineering and management staff also needs to be considered. As indicated at pages II-25 through II-27, the Gannett Fleming recommended 40-L1.5 provides for a reasonable consideration of the historic retirement experience, brings the life estimate closer to that of the peers and is consistent with information from Enbridge internal operating and management staff.

<u>Gannett Fleming Comments related to Account 475.3 – Distribution Mains Plastic</u>
This account has exhibited only a limited amount of retirement experience to date. However, as indicated at page II-27, the pipe in this account that was installed in the 1968 through 1982 era has exhibited some performance issues and it is expected to retire over the next number of years, resulting in a life of 40 to 50 years. The review of the average life estimates of the peer group of companies did indicate that a life extension is required. However, given the expectation of potential upcoming retirement programs in this account, Gannett Fleming considered that a life extension of more than five years is not appropriate at this time.

UNDERTAKING JT1.15

UNDERTAKING

TR 1, page 110

To reconcile the figures in Exhibit I, Issue D1, Schedule 20.3 and 20.4 showing the total costs for the categories by year and clarifying what is included, what is not included.

RESPONSE

Particulars ($ millions)	Budget 2013	Estimate 2012	Actual 2011	Actual 2010	Actual 2009	Actual 2008	Actual 2007
Total Gross Salaries	$186.0	$176.6	$150.6	$139.8	$132.9	$131.8	$128.9
CC/CIS	(6.5)	(6.2)	(4.6)	(5.2)	(3.5)	(2.6)	(1.6)
Demand Side Management	(4.8)	(4.6)	(3.9)	(3.9)	(3.7)	(3.3)	(3.0)
Overtime	4.3	3.3	5.0	5.2	4.0	4.9	6.1
Direct Capitalization and Other	(8.2)	(8.3)	(5.5)	(2.2)	(4.5)	(3.8)	(3.4)
Salaries and Wages in Other O&M	$170.9	$160.7	$141.5	$133.8	$125.1	$127.0	$127.1

Witnesses: K. Culbert
S. Kancharla

UNDERTAKING JT1.16

UNDERTAKING

TR 1, page 112

To provide, by year, total compensation broken down between base, incentive, both short term and long term, benefits separated and pension separated.

RESPONSE

	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Estimate	2013 Budget
Base Pay							
Management	12,593	14,758	16,079	17,612	19,452	21,056	21,911
Supervisory	77,189	79,018	78,882	83,387	91,656	111,562	119,216
Union	39,125	38,035	37,905	38,822	39,494	43,932	44,861
Total Base Pay	128,906	131,811	132,866	139,821	150,602	176,550	185,988
Incentive Pay							
STIP	20,084	19,109	25,303	19,681	25,206	19,428	20,257
LTIP	1,700	3,100	4,300	4,800	6,400	7,500	7,700
Benefits	24,390	22,047	22,770	22,864	24,263	25,941	30,452
Pensions	1,499	1,749	2,570	3,994	3,225	20,557	37,300
Total Compensation	176,579	177,816	187,809	191,159	209,695	249,976	281,697

The incentive pay (STIP and LTIP) has not been provided by the employee group as this would be unduly time-consuming. In regards to the LTIP breakdown by employee group, an estimate would be 90% management and 10% supervisory. For benefits and pensions, a breakdown by employee group is not possible as these costs are not tracked by employee salary grades.

Witnesses: K. Culbert
S. Kancharla

UNDERTAKING JT1.20

UNDERTAKING

TR 1, page 126

To provide Schedule 8 of T2 2011 Tax Return.

RESPONSE

Please see attached.

Witnesses: K. Culbert
S. Kancharla
B. Yuzwa

Canada Revenue Agency / Agence du revenu du Canada

SCHEDULE 8

CAPITAL COST ALLOWANCE (CCA)

Name of corporation	Business Number	Tax year end Year Month Day
ENBRIDGE GAS DISTRIBUTION INC.	10520 5140 RC0001	2011-12-31

For more information, see the section called "Capital Cost Allowance" in the *T2 Corporation Income Tax Guide*.

Is the corporation electing under regulation 1101(5q)? **101** 1 Yes ☐ 2 No ☒

	1 Class number (See Note) **200**	Description	2 Undepreciated capital cost at the beginning of the year (undepreciated capital cost at the end of last year) **201**	3 Cost of acquisitions during the year (new property must be available for use)* **203**	4 Net adjustments** **205**	5 Proceeds of dispositions during the year (amount not to exceed the capital cost) **207**	6 50% rule (1/2 of the amount, if any, by which the net cost of acquisitions exceeds column 5)*** **211**	7 Reduced undepreciated capital cost	8 CCA rate % **212**	9 Recapture of capital cost allowance (line 107 of Schedule 1) **213**	10 Terminal loss (line 404 of Schedule 1) **215**	11 Capital cost allowance (for declining balance method, column 7 **multiplied** by column 8, or a lower amount) (line 403 of Schedule 1) ***** **217**	12 Undepreciated capital cost at the end of the year (column 6 **plus** column 7 **minus** column 11) **220**
1.	1	NG Distribution pipelines--pre Ma	2,018,020,083			0		2,018,020,083	4	0	0	80,720,803	1,937,299,280
2.	2	NG DISTRIBUTION PIPELINES	136,847,006			534,232		136,312,774	6	0	0	8,178,766	128,134,008
3.	6		708			0		708	10	0	0	71	637
4.	8	Class 8-Other	8,822,881	5,319,473		0	2,659,737	11,482,617	20	0	0	2,296,523	11,845,831
5.	10	TRANSPORTATION EQUIP, COMI	23,251,297	7,287,011		382,375	3,452,318	26,703,615	30	0	0	8,011,085	22,144,848
6.	12	SOFTWARE	13,641,256	30,821,784		0	15,410,892	29,052,148	100	0	0	29,052,148	15,410,892
7.	17		36,430			0		36,430	8	0	0	2,914	33,516
8.	38	HEAVY WORK EQUIPMENT	5,484,786	1,506,870		61,508	722,681	6,207,467	30	0	0	1,862,240	5,067,908
9.	3	TECUMSEH-BUILDINGS	262,293			0		262,293	5	0	0	13,115	249,178
10.	41	TECUMSEH-WELL EQUIP-REGUL	30,715,175	7,170,683		0	3,585,342	34,300,516	25	0	0	8,575,129	29,310,729
11.	1	TECUMSEH-FIELD LINES	2,967,219			0		2,967,219	4	0	0	118,689	2,848,530
12.	2	TECUMSEH-FIELD LINES	1,178,153			0		1,178,153	6	0	0	70,689	1,107,464
13.	6	TECUMSEH CLASS 6	16,143			0		16,143	10	0	0	1,614	14,529
14.	8	TECUMSEH MISC EQUIP	57,140			0		57,140	20	0	0	11,428	45,712
15.	10	TECUMSEH TOOLS & TRA	9,402			0		9,402	30	0	0	2,821	6,581
16.	17	TECUMSH CLASS 17	1,831			0		1,831	8	0	0	146	1,685
17.	45	COMP HARDWARE-APR 04 to MA	1,618,999			0		1,618,999	45	0	0	728,550	890,449
18.	13	LEASEHOLD IMPROV	1,306,431	575,196		0	287,598	1,594,029	NA	0	0	402,801	1,478,826
19.	51	Natural gas distrib pipelines-post	825,925,327	268,185,502		0	134,092,751	960,018,078	6	0	0	57,601,085	1,036,509,744
20.	51	FIELD LINES UNREGULATED STC	13,680,873	16,883,963		0	8,441,982	22,122,854	6	0	0	1,327,371	29,237,465
21.	41	WELL EQUIPMENT-UNREGULATE	20,482,952	18,287,486		0	9,143,743	29,626,695	25	0	0	7,406,674	31,363,764
22.	50	COMPUTER SYSTEM SOFTWARE.	3,882,533	8,546,876		0	4,273,438	8,155,971	55	0	0	4,485,784	7,943,625
23.	12	CIS-ACQUIRED SOFTWARE	87,833,197			0		87,833,197	100	0	0	22,760,000	65,073,197
		Totals	3,196,042,115	364,584,844		978,115	182,070,482	3,377,578,362				233,630,446	3,326,018,398

Note: Class numbers followed by a letter indicate the basic rate of the class taking into account the additional deduction allowed. Class 1a: 4% + 6% = 10% (class 1 to 10%), class 1b: 4% + 2% = 6% (class 1 to 6%).

* Include any property acquired in previous years that has now become available for use. This property would have been previously excluded from column 3. List separately any acquisitions that are not subject to the 50% rule, see Regulation 1100(2) and (2.2).

** Include amounts transferred under section 85, or on amalgamation and winding-up of a subsidiary. See the *T2 Corporation Income Tax Guide* for other examples of adjustments to include in column 4.

*** The net cost of acquisitions is the cost of acquisitions (column 3) **plus** or **minus** certain adjustments from column 4. For exceptions to the 50% rule, see Interpretation Bulletin IT-285, *Capital Cost Allowance – General Comments*.

**** Enter a rate only, if you are using the declining balance method. For any other method (for example the straignt-line method, where calculations are always based on the cost of acquisitions), enter N/A. Then enter the amount you are claiming in column 11.

***** If the tax year is shorter than 365 days, prorate the CCA claim. Some classes of property do not have to be prorated. See the *T2 Corporation Income Tax Guide* for more information.

T2 SCH 8 (11)

Canada

UNDERTAKING JT1.21

UNDERTAKING

TR 1, page 137

To reconcile SLAs and Gazifère outbound service costs in this schedule (Exhibit I, Issue D6, Schedule 20.1, Attachment 4).

RESPONSE

Please see Attachment 1.

Witnesses: K. Culbert
B. Yuzwa

2011 Reconciliation of EGD's Recoveries under the SLAs and Gazifere's Summary of Costs from EGD

EGD's Recoveries for Services under the SLAs		
Application Hosting and Maintenance Services	111,943	Fixed fees - per SLA
Application Operations Services (Envision)	150,900	Fixed fees - per SLA
Audit Services	0	
Corporate Security Services	2,628	Charges were based on the 2011 hourly rates per SLA
Dispatch Call Answering Services	109,431	Charges were based on the 2011 cost/call rates per SLA
EHS Services	5,920	Charges were based on the 2011 rates and fixed fees per SLA
Engineering & Operations Services	186,963	Charges were based on the 2011 rates and fixed fees per SLA
Financial Business Consulting Services	0	
Fleet & Equipment Services	150,002	Charges were based on the 2011 rates per SLA
Governance Services	0	
HR Services	23,944	Charges were based on the 2011 rates per SLA
IT Consulting and Professional Services	94,665	Charges were based on the 2011 hourly rates per SLA
IT Infrastructure Services	192,155	Charges were based on the 2011 rates per SLA
Legal Corporate & Executive Services	26,298	Charges were based on the 2011 hourly rates per SLA
Regulatory Services	76,894	Charges were based on the 2011 hourly rates per SLA
Risk Management Services	7,520	Fixed fees - per SLA
Strategy Research Planning Services	11,280	Charges were based on the 2011 hourly rates per SLA
Taxation Services	7,852	Charges were based on the 2011 hourly rates per SLA
Key Accounts (Direct Purchase) Services	8,312	Charges were based on the 2011 hourly rates per SLA
Public & Gov't Affairs Services	0	
	1,166,706	
Reimbursement of Costs		
Transfer of receipts (before CIS)	0	Only needed prior to the implementation of CIS where Gazifere did not have the capability to handle receipts
Labour JV84 C&M	460,816	Chargebacks for employee insurance premiums paid by EGD on Gazifere's behalf
Miscellaneous	(383,859)	Refund related to RBS Settlement passed on by EGD to Gazifere
Computer Equipment	2,451	Chargebacks for computer equipment purchases
Employee Benefits	128,263	Chargebacks for employee insurance premiums paid by EGD on Gazifere's behalf
Gas Cost	23,814,290	Accounted for under a separate contract
Gas Cost Adjustment	(3,785)	Accounted for under a separate contract
	24,018,176	
Other	(3,513)	Reconciling difference (time to investigate exceeds benefits)
Gazifere Summary of Costs (from EGD) per Attachment 4, 1-D6-20.1	**25,181,369**	

UNDERTAKING JT1.22

UNDERTAKING

TR 1, page 143

To provide impact on 2013 revenue requirement of a plus or minus 20 percent sensitivity analysis for the equity return for pension costs; a plus or minus 1 percent sensitivity analysis on the yield curve; a description of the impact of the sensitivity analysis on actuarial gains and losses that could be incorporated into future rates.

RESPONSE

Accounting Costs

The table below shows the projected 2013 US GAAP accrual costs under the baseline scenario contained in Mercer's June 1, 2012 report on pension costs, as well the equity return and interest rate sensitivities, broken down by plan:

2013 Accrual Costs – US GAAP ($ Millions) – EGDI Only

	EGD RPP	*SERP*	*SSERP*	*Total*
Baseline scenario	$35.6	$0.9	$0.1	$36.6
2012 equity returns 20% higher than baseline	$22.7	$0.5	$0.0	$23.2
2012 equity returns 20% lower than baseline	$48.6	$1.1	$0.1	$49.8
Yield curve at year-end 2012 shifts up by 1%	$24.9	$0.6	$0.1	$25.6
Yield curve at year-end 2012 shifts down by 1%	$44.5	$1.1	$0.0	$45.6

A 20% difference between actual and expected return on equities in 2012 would result in an actuarial gain or loss of approximately $85 million as of December 31, 2012. A 1% shift in the yield curve would result in an actuarial gain or loss of approximately $124 million as of December 31, 2012. These amounts would get added to the unamortized net actuarial gain or loss at December 31, 2012 and get amortized into expense starting in 2013. The above amounts are in respect of EGDI's share of the RPP, SERP, and SSERP only.

Witnesses: K. Culbert
A. Patel
S. Trozzi
B. Yuzwa
M. Monteiro, Mercers Canada

Cash Costs

The table below shows the projected cash cost in 2013 under the baseline scenario contained in Mercer's June 1, 2012 report on pension costs, as well the equity return and interest rate sensitivities, broken down by plan:

	EGD RPP	*SERP*	*SSERP*	*Total*
Baseline scenario	$38.4	$0.3	$0.0	$38.7
2012 equity returns 20% higher than baseline	$20.1	$0.0	$0.0	$20.1
2012 equity returns 20% lower than baseline	$56.7	$0.8	$0.0	$57.5
Yield curve at year-end 2012 shifts up by 1%	$0.0	$0.0	$0.0	$0.0
Yield curve at year-end 2012 shifts down by 1%	$66.4	$0.9	$0.0	$67.3

A 20% difference between actual and expected return on equities in 2012 would result in an asset gain or loss of approximately $85 million as at December 31, 2012. A 1% shift in the yield curve would result in a solvency liability gain or loss of approximately $122 million at December 31, 2012.

Witnesses: K. Culbert
A. Patel
S. Trozzi
B. Yuzwa
M. Monteiro, Mercers Canada

UNDERTAKING JT1.23

UNDERTAKING

TR 1, page 153

To provide qualitative description of Exhibit A2, Tab 3, Schedule 1 to explain in more detail the larger numbers and how and why the balances flowed into account over time.

RESPONSE

Please see Attached.

Witnesses: K. Culbert
A. Patel
S. Trozzi
B. Yuzwa
M. Monteiro, Mercers Canada

Enbridge Gas Distribution Inc.
Supplement to Appendix 2 - Continuity Schedule of the OPEB Funded Status
(in millions)

EGD's Consolidated - includes St. Lawrence Gas			
1	Beginning Balance of Accrued Benefit Obligation - September 30, 2001	(50.40)	
2	Cumulative Accrual Expense	(81.90)	
3	Cumulative Benefits Paid	29.80	
1	Ending Balance of Accrued Benefit Obligation - December 31, 2011		(102.50)
4	Beginning Balance of Plan Assets - September 30, 2001	-	
3	Cumulative Benefits Paid	(29.80)	
5	Cumulative Employer Contributions	35.80	
4	Ending Balance of Plan Assets - December 31, 2011		6.00
6	Funded Status - December 31, 2011		(96.50)
7	Unamortized Net Actuarial Loss	9.00	
8	Unamortized Transitional Obligation	13.00	
			22.00
	Net Amount Recognized on the Balance Sheet for Canadian GAAP		(74.50)

EGD Only - excludes St. Lawrence Gas			
1	Beginning Balance of Accrued Benefit Obligation - December 31, 2009	(77.00)	
2	Cumulative Accrual Expense	(34.00)	
3	Cumulative Benefits Paid	12.00	
1	Estimated Ending Balance of Accrued Benefit Obligation - December 31, 2012		(99.00)
4	Beginning Balance of Plan Assets - December 31, 2009	-	
3	Cumulative Benefits Paid	(12.00)	
5	Cumulative Employer Contributions	12.00	
4	Estimated Ending Balance of Plan Assets - December 31, 2012		-
6	Estimated Funded Status - December 31, 2012		(99.00)
7	Unamortized Net Actuarial Loss	9.00	
8	Unamortized Transitional Obligation	10.00	
			19.00
	Estimated Net Amount Recognized on the Balance Sheet for Canadian GAAP		(80.00)

Note:

1 The accrued benefit obligation represents the present value of all future benefits attributed to employees.

2 Accrual expense is comprised of 1) Service cost 2) Interest cost and 3) amortization of actuarial loss. Service cost is the present value of the benefits earned by employees during the year. Interest cost represents an increase in the obligation due to the passage of time. The amortization of the actuarial loss represents changes in actuarial assumptions amortized using the corridor method.

3 Benefits paid represents monies which plan participants were entitled to during the period.

4 Plan assets repesents excess monies contributed that have been segregated and restricted for future benefit payments. The plan assets as of December 31, 2011 relate entriely to St. Lawrence Gas; EGD does not have any plan assets for its OPEB plan.

5 Employer contributions represents monies which have been paid into the plan by the employer.

6 Funded status represents the the difference between the Accrued Benefit Obligation and Plan Assets

7 Net actuarial loss represents a change in the benefit obligation resulting from experience different from that assumed or a change in the actuarial assumptions.

8 The transitional obligation represents an unrecognized amount upon adoption of CICA 3461.

UNDERTAKING JT1.24

UNDERTAKING

TR 1, page 158

To confirm whether there is an amendment subsequent to April 1, 2012 that includes provisions for low-income, and if so, file a version of it.

RESPONSE

On July 12, 2012 the Ontario Energy Board issued a "Notice of Proposal to Amend a Rule" "Eligible Low Income Customer Service Policy Amendments to the Gas Distribution Access Rule" under the Board's File Number EB-2010-0280. The Company provided its comments concerning this proposal to the Board on July 26, 2012. On September 6, 2012 the Board issued a "Notice of Amendment to a Rule" "Eligible Low Income Customer Service Policy Amendments to the Gas Distribution Access Rule".

The Gas Distribution Access Rule ("GDAR") amendments setout in the Board's September 6, 2012 notice are to become effective on January 1, 2013. These amendments to GDAR will require Enbridge to introduce changes to its business processes, enhancements to its Customer Information System and will require updates to its Conditions of Service to be implemented by January 1, 2013. The Company is currently working on the necessary revisions to its Conditions of Service to accommodate the new low income customer service policies. These will be posted on the Company's website in advance of January 1, 2013. A copy of the Board's September 6, 2012 Notice and GDAR Amendment are attached for reference.

Witness: K. Culbert

Ontario Energy Board

Commission de l'énergie de l'Ontario

Ontario

NOTICE OF AMENDMENT TO A RULE

ELIGIBLE LOW-INCOME CUSTOMER SERVICE POLICY AMENDMENTS TO THE GAS DISTRIBUTION ACCESS RULE

BOARD FILE NO: EB-2010-0280

To: All Natural Gas Distributors
All Participants in Consultation Processes EB-2010-0280, EB-2007-0722, EB-2008-0313 and EB-2008-0150
All Other Interested Parties

Date: September 6, 2012

The Ontario Energy Board has today issued amendments to the Gas Distribution Access Rule (the "GDAR") as indicated below, pursuant to section 44(1) of the *Ontario Energy Board Act, 1998* (the "Act").

I. Background

On July 12, 2012, the Board issued a Notice of Proposal to Amend a Rule (the "July Notice") in which it proposed a number of amendments to the GDAR (the "Proposed Amendments"). The Proposed Amendments were designed to ensure that rate-regulated natural gas distributors develop and maintain appropriate customer service policy standards and practices for their low-income customers, and to ensure that they publish and comply with those policy standards and practices.

In response to the July Notice, the Board received written comments from two gas distributors and a ratepayer group representative. These comments are available for viewing on the Board's website www.ontarioenergyboard.ca under Industry/Regulatory Proceedings/Policy Initiatives and Consultations/GDAR Customer Service Amendments or at the following link: http://www.ontarioenergyboard.ca/OEB/Industry/Regulatory+Proceedings/Policy+Initiatives+and+Consultations/GDAR+Customer+Service+Amendments#20120730.

II. Summary of Comments in Response to the July Notice

Enbridge Gas Distribution Inc. ("Enbridge") and Union Gas Limited ("Union") confirmed that they will maintain appropriate customer service policy standards and practices for their eligible low-income residential customers. Moreover, the utilities made assurances that those policy standards and practices will be published, and that they will comply with those standards and practices as of January 1, 2013.

Enbridge and Union reiterated their earlier submissions that they both intend to track any costs incurred for system and process changes required to implement their customer service policies in their respective GDAR Costs Deferral Account for potential future disposition. The utilities will also be monitoring ongoing operational and potential lost revenue impacts.

The Low-Income Energy Network ("LIEN") concurred with the Proposed Amendments.

LIEN further stated that the value of the less-prescriptive approach adopted by the Board will be demonstrated in the implementation of the changes the gas distributors have committed to make to their eligible low-income customer service policies, effective January 1, 2013. In support of the Board's upcoming consultation on customer service monitoring and reporting requirements, LIEN submitted that in order to demonstrate the value of a less-prescriptive approach, the results should be measured over time.

LIEN also noted that the Board intends to later review the posted customer service policies of the rate-regulated gas distributors to assess whether they are consistent with the expectations of the Board. LIEN requested that the Board engage stakeholders in that review process.

III. Adoption of Proposed Amendments

The Board has considered all of the comments received and has determined that no change needs to be made to the Proposed Amendments.

The eligible low-income customer service amendments to the GDAR as adopted by the Board (the "Final Amendments") are set out in Attachment A to this Notice.

IV. Anticipated Costs and Benefits

As indicated in the July Notice, these amendments to the GDAR will require each rate-regulated gas distributor to document and consistently apply the low-income customer service policies committed to during this consultation. This is expected to provide greater protection and certainty for eligible low-income customers in the areas of security deposits, access to equal billing and payment plans, arrears agreements and under billing adjustments. The approach adopted will also provide gas distributors with an appropriate measure of flexibility to account for each utility's operational considerations, as well as lower overall implementation costs. While proceeding with these amendments may lead to some additional costs for the gas distributors, the Board believes that the benefits to low-income gas customers will be substantial.

V. Updating Customer Service Reporting Requirements

As indicated in its March 1, 2012 letter in this consultation, the Board believes that developing effective customer service monitoring and associated regulatory reporting requirements is important to ensure that the residential and eligible low-income customer service policies in the gas sector are achieving their intended objectives. Given that the gas sector will not be subject to detailed prescriptive customer service rules, it will be useful to monitor customer complaints that may emerge. The Board will initiate a separate consultation process in this area shortly.

VI. Cost Awards

The Board has addressed cost claims for commenting on the July Notice, as well as the earlier Notices in this consultation, in separate correspondence issued today.

Costs in respect of providing any future comments on proposed updated gas sector customer service reporting requirements will be addressed later.

VII. Coming into Force

The Board will adopt January 1, 2013 as the coming into force date for the eligible low-income customer service policy amendments to the GDAR. As of that date, each rate-regulated gas distributor must have an appropriately updated Customer Service Policy

posted on its website and must conduct its business in accordance with that Customer Service Policy.

This Notice, including the Final Amendments to the GDAR set out in Attachment A, is available for public inspection on the Board's website at www.ontarioenergyboard.ca under Industry/Regulatory Proceedings/Policy Initiatives and Consultations/GDAR Customer Service Amendments or at the following link: http://www.ontarioenergyboard.ca/OEB/Industry/Regulatory+Proceedings/Policy+Initiatives+and+Consultations/GDAR+Customer+Service+Amendments#20120730 and at the office of the Board during normal business hours.

Any questions regarding implementation of the Eligible Low-Income Customer Service Policy Amendments to the GDAR set out in Attachment A should be directed to the Market Operations Hotline at 416-440-7604 or market.operations@ontarioenergyboard.ca.

The Board's toll free number is 1-888-632-6273.

DATED at Toronto, September 6, 2012

ONTARIO ENERGY BOARD

Original signed by

Kirsten Walli
Board Secretary

Attachment A: Final Eligible Low-Income Customer Service Policy Amendments to the Gas Distribution Rule (September 6, 2012)

Attachment A

Eligible Low-Income Customer Service Policy Amendments to the Gas Distribution Access Rule

September 6, 2012

Note: The text of the amendments is set out in italics below, for ease of identification only.

1. Subsection 1.2.1 of the Gas Distribution Access Rule is amended by modifying the definition of "Customer Service Policy" to read as follows:

"Customer Service Policy" means the document developed by a rate-regulated gas distributor in accordance with *chapter* 8 of this Rule that describes the customer service-related standards and practices applicable to its residential customers;

and by adding the following definitions immediately after the definition of "E.B.O. 188 Report":

"*eligible low-income customer" means a residential customer who:*

- *has a pre-tax household income at or below the most recent pre-tax Low Income Cut-Off, according to Statistics Canada, plus 15%, taking into account family size and community size, as qualified by a Social Service Agency or Government Agency; or*
- *has been qualified for Emergency Financial Assistance;*

"*Emergency Financial Assistance" means any Board-approved emergency financial assistance, or other financial assistance made available by a distributor, to eligible low-income customers;*

and by adding the following definition immediately after the definition of "Service Transaction Request":

"Social Service Agency or Government Agency" means:

- *a social service agency or government agency that partners with a given distributor to assess eligibility for Emergency Financial Assistance; or*
- *a social service agency or government agency that assesses eligibility for other energy financial assistance or low-income financial assistance programs, and partners with a given distributor to qualify customers for eligibility under chapter 8 of this Rule;*

2. Subsection 1.4.6 of the Gas Distribution Access Rule is amended by replacing the word “Section” at the beginning of the first paragraph with “*Chapter*”.

3. Section 1.4 of the Gas Distribution Access Rule is amended by adding the following new paragraph immediately after subsection 1.4.6.

> *1.4.7 Subsection 8.1.3 and the amendments to subsection 1.2.1 to include the definition of “eligible low-income customer”, “Emergency Financial Assistance” and “Social Service Agency or Government* Agency” *shall come into force on January 1, 2013.*

4. Chapter 8 of the Gas Distribution Access Rule is amended by adding the following new paragraph immediately after subsection 8.1.2.

> *8.1.3 Where a rate-regulated gas distributor has established customer service-related standards and practices specific to eligible low-income customers, the gas distributor shall describe them in its Customer Service Policy in a manner separate and apart from its customer service-related standards and practices applicable to other residential customers.*

5. Subsection 8.5.1 of the Gas Distribution Access Rule is amended by adding the word “*residential*” following the word “each” in the third line.

UNDERTAKING JT1.25

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TR 1, page 174

To provide RFP.

RESPONSE

The Productivity Study RFP, which was eventually awarded to Concentric Energy Advisors, is attached.

As seen in the document, the RFP was primarily directed at obtaining evidence required to support a productivity factor for Enbridge's anticipated new IR Plan. As such, most of the RFP is not relevant to the current proceeding, which is directed at setting Enbridge's rates for 2013 on a cost of service basis. Although most of the RFP is not relevant to this proceeding, Enbridge has produced the entire document, rather than providing a document that would be almost entirely redacted.

Witnesses: S. Kancharla
M. Lister
M. Bartos, Concentric
J. Coyne, Concentric
J. Simpson, Concentric

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Norm Ryckman
Director, Regulatory Affairs
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Re: Productivity Study Consultant RFP

Background

Enbridge Gas Distribution Inc. ("Enbridge", "EGD" or "the Company") is Canada's largest natural gas distribution utility, having provided natural gas to its franchise areas for over 100 years. Enbridge provides natural gas distribution, transmission, and storage services to about 1.9 million customers in Ontario and through its subsidiary St. Lawrence Gas Co. Inc. in upper New York State, and its affiliate Gazifere Inc. in western Quebec. The Company is a wholly owned subsidiary of Enbridge Inc., a world leader in energy transportation, distribution and services.

The Company is regulated by the Ontario Energy Board (OEB). In 2007 the Company filed an application (EB-2007-0615) for a five-year, incentive rate plan covering the years 2008 to 2012, which concluded with a Settlement Agreement. The Company's plan is based upon a revenue per customer cap which adjusts revenues to reflect system growth and inflation. A scaled productivity factor, calculated as a percentage of inflation, is also featured in the Company's current IR plan. In addition, the plan includes an Earning Sharing Mechanism (ESM) where sharing occurs at 50/50 for earnings > 100 bp over the allowed ROE.

EGD's Revenue Cap Formula:

$$RR_t = \frac{(RR_{t-1})}{(C_{t-1})} * (1+GDP\ IPI - X) * C_t + Y_t + Z_t$$

-RR= revenue requirement
- t = rate year
- C = average number of customers
- X = X factor or productivity
- GDP IPI = inflation factor, the GDP Price Index
- Y = specific categories of expense, added at cost of service
- Z = exogenous factors, beyond management's control

RFP Expectations

Enbridge is now beginning to gather information as it prepares for its next generation Incentive Regulation plan (the "IR Plan"). This RFP is specifically aimed at providing Enbridge with the evidence it will require to support the Productivity Factor for its new IR Plan by performing a Productivity Study. In addition, Enbridge's also requests a review

and validation of benefits generated from the current IR plan. The successful consultant will also play a role in providing the Enbridge team with general advice about other IR parameters and the Company's IR Plan strategies.

The Productivity Study must also include the development of specific and quantitative recommendations for productivity that may be applicable to the Company's next generation IR proposal. Recommendations should be based on objective empirical research/data and consistent with the principles for effective incentive mechanisms and regulatory trends across North America.

This information will be used by Enbridge to aid in developing its IR strategy and positions, and it is expected that this material will be put forward as supporting evidence in its application for the next IR plan. As such, the scope of work may also include expert witness testimony and support.

Key Deliverables in this RFP

1. Develop a methodology for, and the production of, a productivity recommendation (X-Factor) for EGD's next IR plan.

2. Work with members of EGD's IR Strategy Development team to provide advice regarding various plan elements or IR parameters, including the X-Factor, and aid in the development of the strategy for advancing the Company's positions. This may include, but not be limited to, a review of EGD's performance in its first IR term, cost performance benchmarking, or advice related to research data on regulatory trends in other jurisdictions.

3. Provide support and endorsement for the Company's overall IR proposal, including specific plan elements.

4. Participate and provide presentations/submissions on behalf of the Company during any OEB consultative processes on IR, if required.

5. Provide evidence and testimony and represent the Company as an expert witness with respect to the productivity recommendation and potentially other IR parameters in a proceeding with the Ontario Energy Board (expected in late 2011 into 2012).

Please note that the quality of all documentation provided to the Company must be suitable for the purposes of regulatory filing.

Expected Project Process & Timelines

Members of EGD's IR strategy development team will be available to the consultant for regular contact as necessary. EGD expects there to be regular communications,

perhaps weekly or bi-weekly, regarding status updates, or potentially directional change, or strategic evolution. We also anticipate meetings in person at various points through the process, as suggested and outlined below. Specifically, we anticipate at least one (potentially more) meetings with EGD's Sr. Management and Executives.

We also anticipate meetings with Stakeholders to socialize our ideas and to incorporate Stakeholder concerns and feedback where possible before we file our application. The Company intends to file its next generation IR Plan in late 2011 and proposes that the Key Deliverables be met as follows.

Scope of Work	Deliverable	Timing	Date
Initial Conference Call with IR Team to discuss expectations, process, and timing	Kickoff Meeting	Q4: 2010	Mid Dec. 2010
Develop Outline of productivity study methodology and recommendation	Outline	Q4: 2010	Early Jan 2011
Preliminary Draft of productivity study results with high level recommendation & direction	Preliminary Draft	Q1: 2011	Early Feb. 2011
Strategy session with EGD Sr. Managers & Executive Team	Strategy Session	Q1: 2011	Feb. 2011
First Draft productivity recommendation and supporting materials	First Draft	Q1: 2011	Feb. 2011
Incorporate Company Feedback	Incorporate Comments	Q2: 2011	Mar. 2011
Final Draft of productivity recommendation and endorsement of EGD IR positions	Final Draft	Q2: 2011	Apr. 2011
Meeting(s) with Stakeholders	Stakeholder Sessions	Q2: 2011	May. / Jun. 2011
Incorporate feedback from Stakeholders	Incorporate Comments	Q2: 2011	Jun. 2011
Draft Final Evidence	Evidence	Q3: 2011	Oct. 2011
Interrogatories, Testimony & other Case Support including settlement negotiations	Case support	2012	2012

Contents of Your Proposal

Responses to this RFP should outline the respondent's supporting knowledge, skills, experience, and accreditation necessary to convince EGD that the respondent is capable of delivering the Key Deliverables. Moreover, the respondent must comment on whether, due to positions taken in the past or for any other reason, they might be limited in their ability to provide the requested research, analysis, or support.

The proposal should include:

- a timeline for the respondent's delivery, relative to Enbridge's expected schedule described in the previous section
- key milestones, including interim reporting by the consultant
- proposed team members, qualifications, availability, and experience of each
- the degree to which EGD resources will be required to complete the study, if any
- the respondent's experience with productivity studies and / or IR plan methodologies
- the respondent's experience before regulatory commissions, including that of key team members, highlighting experience before Canadian regulators
- proposed fee structure, handling of expenses and disbursements, and treatment of travel time, etc.
- contact information for at least three (3) references that have recently been provided these or similar services by the respondent
- an indication of the respondent's willingness to provide proof of Commercial and Professional Liability Insurance, and WSIB standing prior to contract execution
- a schedule of fees for all respondent team members, and overall budget for the entire contract, broken down into estimates by major components
- all fees to be quoted in Canadian dollars, with HST extra

Deadline for submission

Responses will be considered if submitted between December 6 – December 10 and no later than 4:45pm local time on Friday December 10, 2010 and will be received by:

Ms. Mikki Rizvi **Enbridge Gas Distibution Inc.** **Regulatory Affairs, 5th Floor, VPC** **500 Consumers Road** **North York, Ontario** **M2J 1P8**	**By Fax: 416-495-6072** **By email: mikki.rizvi@enbridge.com** **Use of email is encouraged**

Contact

If further clarification or details are required to complete the RFP, please feel free to contact either Michael Lister or Mikki Rizvi.

Michael Lister
Manager, Regulatory Policy & Strategy
416-495-5043
Michael.Lister@enbridge.com

Mikki Rizvi
Sr. Policy & Compliance Advisor
416-495-5988
Mikki.Rizvi@enbridge.com

The Company recognizes the individuality that will be a component of each response.

It is recognized that each respondent may wish to follow a different path in preparing its response, and the Company will make best efforts to support individual requests for information and meetings. The Company reserves the right to share, or not to share, information exchanged as a result of individual meetings.

The Company reserves the right to select all, or part, of a proposal or not to select any of the proposals submitted in response to the RFP.

Yours truly,

Norm Ryckman
Director, Regulatory Affairs

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To confirm whether EDGI has adopted all of the recommendations in the PSE study; if not, what parts it has not adopted and why.

RESPONSE

The question was a follow-up to EDGI's response to CCC Interrogatory #5, reproduced below for easy reference:

> Please explain Enbridge's position regarding the conclusions set out in the PSE Productivity study. Does Enbridge adopt the recommendations? How does this study impact the relief Enbridge is seeking in this case?
>
> RESPONSE
> The PSE study does not impact the relief that EGD is seeking in this case, rather, the PSE report was filed as EGD's response to the Pacific Economics Group Research (PEGR) report issued as part of the Preliminary Assessment of Incentive Regulation of Natural Gas Utilities (EB-2011-0052). The PSE study was filed in this case to be available in the event that other parties rely on the PEG report in this proceeding.

Upon review of the PSE study in question, Enbridge cannot say it has "adopted all of the recommendations in the PSE study" at this time. As stated on page 1 of the PSE report:

> Power System Engineering, Inc. (PSE) was engaged by EGD to prepare the present report (PSE Review), which provides a preliminary review and appraisal of the key PEG-R Report findings, primarily as they pertain to EGD. The preliminary nature of the PSE Review's analysis is largely due to our current inability to review PEG-R's working papers, calculations, and clarify results as of yet.

Witnesses: S. Kancharla
M. Lister
P. Squires
M. Bartos, Concentric
J. Coyne, Concentric
J. Simpson, Concentric

Given the preliminary state of PSE's report, and the aforementioned limitations, it would be premature for Enbridge to unequivocally adopt the recommendations for improvements to the PEG-R methodology contained in the report. Enbridge does, however, believe that PSE, based on its review of the PEG-R Report, has raised some important methodological issues. To the extent the PEG-R report is submitted as evidence in any subsequent proceeding concerning measurement of EGDI's productivity, then EGD believes that proceeding would be the proper time to determine whether further analysis of the PEG-R methods should be undertaken.

Witnesses: S. Kancharla
M. Lister
P. Squires
M. Bartos, Concentric
J. Coyne, Concentric
J. Simpson, Concentric