



COMMERCE COMMISSION

INFORMATION DISCLOSURE REGULATION UNDER PART 4 OF THE COMMERCE ACT 1986

Workshop 1: Gas Asset Management Plan Requirements Workshop Minutes

Venue

Kauri Room,
Level 6, 44 The Terrace,
Wellington.
Friday 20 May 2011, 8:55am–1:00pm

Participants

Karen Murray	Commission (Chair)
Robert Gordon	Commission
John Groot	Commission
Paul Mitchell	Commission
Paul Ware	Commission
Geoff Evans	GasNet
Wayne Armishaw	GasNet
Richard Hale	Hale & Twomey
Stuart Dickson	MDL Technical Operator
Blair Robertson	MDL
Don Gray	MDL
Charlotte Littlewood	Powerco
Dan Hynson	Powerco
Andrew Stevenson	Powerco
Peter Thorley	Vector
Barry Parsons	Vector
Ryno Verster	Vector

Introduction to Workshop

The Chair welcomed Richard Hale and Stuart Dickson whose interest in the workshop was registered after the agenda had been circulated. Apologies were received from GIC as they were unable to attend.

The purpose of the workshop is to assist the Commission in preparing its draft decision and draft determination on information disclosure for GPBs.

The Commission's current view is that Asset Management Plans (AMPs) are an important part of meeting the purpose of information disclosure, which is that interested parties have sufficient information to assess whether the purpose of Part 4 of the Commerce Act is being met. The Commission is keen to avoid creating a regulatory compliance requirement that bears no relationship to how GPBs run their businesses and is open to exploring ways to minimise the costs of disclosing AMP information. It is hoped that this workshop will assist in achieving these objectives.

No formal post workshop submissions are requested, but participants are welcome to provide material after the workshop. Draft determination(s) and a reasons paper (which will include the draft AMP requirements) are expected to be released in September 2011 for formal consultation. The determination is likely to have a core requirement that applies to both transmission and distribution pipeline services, plus specific details for each.

The workshop agenda was circulated to registered attendees on 19 May, and contained items for discussion proposed by Powerco and Vector. A copy of the agenda is attached (Appendix 1). A draft set of AMP requirements (the discussion draft for Session 2) was posted on the Commission's website on 6 May.¹

Session 1: Asset Management Planning by Suppliers of Gas Pipeline Services—Presentations by GPBs

Each GPB briefly presented its views on how AMPs are currently utilised within their organisations. The slides prepared by Vector are attached (Appendix 2). The general themes that arose from these presentations were as follows (with associated comments by individual participants):

- 1) In-house AMPs are now much more generally relied upon than in the past but require large amounts of data to prepare. Powerco, Vector and MDL already have AMPs or are in the process of preparing them:
 - a) Vector: The existing gas distribution AMP mirrors the AMP disclosure requirements for EDBs. An exhaustive gas transmission AMP is being finalised;
 - b) Powerco: Has an AMP document already but it is currently used infrequently. Other internal documents (standards etc.) generally meet all stakeholder requirements. Is developing a formal AMP as part of the review of asset management systems;
 - c) MDL: Prepared its first formal AMP last year and is revising it this year with the objective of getting it up to the standard required by the Commission. Considerable additional material would be required to meet the discussion paper requirements;
 - d) GasNet: Supports the need for and agrees with the principle of an AMP. Understands the Commission's concerns with price and quality. Notes the considerable amount of information required and the proposed timeframes but will meet them as necessary. Emphasis to date has been on asset management systems.
- 2) AMPs are generally prepared to align with the companies' annual budget periods (i.e., July–June, or January–December for MDL).

¹ The prepared document *AMP Information Disclosure for GPBs: Discussion Draft for the 20 May 2011 Gas AMP Requirements Workshop*, 6 May 2011, is available from the Commerce Commission website at <http://www.comcom.govt.nz/gas-information-disclosure>.

- 3) GPBs agree with the need to prepare regulatory AMPs and are keen to make the requirements workable. Companies need at least 4–6 months to prepare their AMPs for review by company directors:
 - a) Powerco: Is keen to make the regulatory AMP workable while avoiding ‘death by 1,000 cuts’. The regulatory AMP should be pragmatic and small to minimise costs;
 - b) Powerco: It takes 4–5 months to prepare a regulatory AMP based on EDB requirements before it is ready to go to the Board.
- 4) With the gas pipeline sector being much smaller than the electricity lines sector, gas businesses have fewer staff. This needs to be considered when deciding on costs of preparing AMPs.
- 5) AMPs should align with PAS55 and avoid duplication with other audit requirements. The current focus for auditors is not around AMPs but around alignment of processes. The public safety management system (SMS) regulation requires external audit, and duplication of this audit should be avoided. The AMP is a small component of asset management. Asset management gets assured under PAS55, and only 7 of the 121 PAS 55 audit questions relate directly to the in-house AMP.
- 6) AMPs are forward-looking and should not be used to compare GPBs.
- 7) There is general commonality between EDB and GPB AMPs, but there are also some important differences and future information disclosure requirements will need to reflect these.
- 8) The pipeline capacity disclosures in the current Gas (Information Disclosure) Regulations 1997 are considered to have on their own little if any value, yet take considerable time and effort to prepare.
- 9) Investment forecasts are uncertain beyond 3–5 years and the locational and timing uncertainties that affect volume and capacity demand forecasts are greater for gas pipelines than for electricity lines:
 - a) Vector: GTB AMPs typically contain few projects compared with the electricity AMP and have a lumpy and uncertain investment profile;
 - b) Vector: AMPs have no visibility on customer driven projects beyond 5 years out, by which time the capex forecasts comprise mainly general integrity and replacement with little development and growth.
- 10) The large swings in forecast demand result in a large variance between central forecasts and actuals:
 - a) Powerco: The 10% variance threshold for the EDB reconciliation report requirements is of concern given the uncertainty inherent in gas forecasts;
 - b) GasNet: The 10 year duration of the EDB reconciliation is of concern—2–3 years may be appropriate.
- 11) Each GPB compiles its own demand forecast and there may be scope for a unified approach in the future:
 - a) MDL: Demand forecasts are uncertain and so existing forecasts have a 5 year horizon. With four major users: Genesis, Methanex, Mighty River Power, Contact Energy, it is not only commercial factors but also government policy/pressures that can swing demand, e.g. the use of gas-fired power stations. Demand is also becoming

increasingly peaky. There may be room for a combined industry demand forecast. The GIC has a programme looking at gas demand forecasting;

- b) Powerco: Gas retailers have better foreknowledge of customer demand than GDBs.

12) Safety and capacity are the main drivers of gas AMPs:

- a) Vector: Asset management is largely concerned with the ‘integrity space’, with safety being the main driver for GPBs. Network capacity is the next important driver for both the distribution and the transmission businesses;
- b) Powerco: Any consumer consultation requirements need to recognise that gas asset management is heavily driven by safety issues. Safety is important to consumers. Two thirds of incidents are caused by third parties. A single third party damage incident might increase SAIDI by a factor of 11,000;
- c) MDL: In essence, measured quantities that relate to future potential capacity constraints measure the ability to supply north of the Mokau compressor station.

Session 2: What should the requirements of an AMP for GTBs and GDBs be?

The purpose Session 2 was to talk through the discussion draft² and explore in more detail the discussion points submitted by Powerco and Vector ahead of the workshop. The Commission provided an overview of the purpose of information disclosure (of which the AMP is a part) and its relation to the Part 4 purpose as specified in 52A of the Act. There then followed some detailed discussion on the following points.

2a. Relevance of a 10 year AMP period

On the question of the need to provide AMPs covering a 10 year period, attendees expressed concern that demand and expenditure forecasts beyond a five year horizon are both meaningless and extremely prone to inaccuracies given the lumpy nature of investment in the gas sector. However, following discussion attendees considered that a 10 year AMP could be compiled provided there were assurances were that these could be modified as necessary and that they would not be solely relied upon for future decision making.

A question was also raised regarding the validity of AMPs being amended on an annual basis and the value of GPBs undertaking this task annually. It was suggested that minimum ‘key criteria’ (yet to be defined) could be updated and provided on an annual basis but that entire AMPs might be revised only every two years. GPBs believed this would significantly reduce regulatory compliance costs. The Commission agreed to give further consideration to this suggestion and would welcome further feedback.

2b. Disclosure of pipeline capacities in AMPs

Attendees considered that the requirement to disclose pipeline capacities in the discussion draft (clause 2.8 of Part 2) was of no value to either GPBs or users of their pipelines as it is not a true measure of capacity. By way of example, GPBs were of the view that nobody has ever requested this information from them and that GPBs are, to a large degree, reliant upon retailers to provide substantial amounts of this data which may or may not happen. However,

² ibid

it was accepted that information on capacity needs to be disclosed. As a viable alternative, GPBs consider that disclosing pressure, flows and throughput at numerous points on their networks would be a much more realistic and useful measure of capacity. Powerco noted that GPBs are already required to monitor these outputs under AS/NZS 4645.

2c. Disclosure of potentially confidential information

Powerco raised the view that some new infrastructure investments may be commercially sensitive and that it would place them at a competitive disadvantage to disclose these in advance. There was a general view from attendees that the Commission may need to provide a clear process around the disclosure of what GPBs may deem to be potentially confidential information as part of AMPs.

MDL and Vector also commented that GTBs are very reliant upon retailers and shippers for information on future demand expectations. This enables them to accurately predict future trends and volumes that will need to be transported through the various pipeline systems. Specific disclosure of retailer/shipper specific data may result in a reluctance from these parties to provide such information in future and this would be highly undesirable for GPBs. However, it was agreed that a high-level aggregation of data (e.g., on a per gas gate basis) would largely overcome this issue for GDBs. For GTBs there is a concern that direct-connected customers would still be identifiable.

2d. Quality Measures and Service Levels

Parties confirmed that, subject to gas-specific issues being resolved, asset management links to service levels as in clause 4.5.4 of the discussion draft would work.

There was discussion around the appropriateness of a SAIDI/SAIFI measure for GPBs. The Commission noted that it would be appropriate for GPBs to formally provide their views on this matter as part of their submissions to the Gas DPP Discussion Paper (closing date for submissions are 27 May 2011). However, the Commission noted that, while there may be some imperfections in using SAIDI/SAIFI to inform GDB AMPs, there does not appear to be a better alternative reliability measure and attendees agreed this was the case.

MDL noted that SAIDI and SAIFI don't necessarily provide good measures of transmission reliability, and commented that n-1 redundancy for compressors is a demonstrable quality measure. In transmission, critical contingency situations are tied in with a pre-defined pressure. MDL proposed that an additional 'producer outage' category be added to specifically identify producer outage events.

Identification of outage events caused by third party damage is not automatically captured on Powerco's distribution networks but is captured on Vector's transmission networks.

It was suggested that more emphasis may be needed on safety performance measures given that safety is a major driver of investment. It was also suggested that the Commission should consider using a 'security standard' as was the case for the electricity sector.

2e. Non-contiguous networks

Powerco questioned the level of reporting that AMPs may require as, in theory, this could result in Powerco having to disclose separate data for each of 35 networks that might be considered non-contiguous. Vector and GasNet also considered that a requirement for this level of disaggregated data would create major problems.

The Commission agreed that the technical definition of non-contiguous networks was not what it was seeking to apply. The possibility of disclosing on a regional level rather than a non-contiguous level was discussed. Vector agreed that disaggregation for expenditure would be appropriate to justify investments. GasNet referred to the geographic coverage of its networks and noted that any requirement for separate AMP expenditure forecasts and reconciliation reports for each non-contiguous network would be very problematic and costly.

GPBs undertook to come back in submissions on the Gas DPP Discussion Paper with more information on a sensible split for their networks.

2f. Categorisation of assets

Vector raised the issue that the Capex categories in Schedule 6 of the draft discussion paper did not appear to be reflected in the main body of text in Schedule 4. The Commission agreed to examine and modify these where necessary.

Vector also noted that it currently assigns assets by activity rather than by category. This is not a major issue but may result in more work for them to re-define their assets by category. Vector noted that, because of the integrated nature of its businesses, it would be very difficult to disclose accurate forecasts for expenditure on non-system fixed assets on a per business basis. The Commission will give further thought to these points.

MDL expressed a wish to have in-line valves identified as a separate asset category, given their criticality to the overall integrity of their network and the fact that GPBs generally treat these as a station. The Commission noted that these may be covered as 'other assets' under the CPP input methodologies.

Session 3: Timing of the first disclosure of GPB AMPs

The Commission is currently working on the assumption that the first AMP disclosures under the new requirements would be made on 30 September 2012 and relate to October–September planning years. This would achieve alignment between the regulatory control, assessment and pricing year periods for GPBs as proposed in the Gas DPP Discussion Paper currently out for consultation with stakeholders.

Powerco and Vector noted that their current information disclosures are prepared to align with their financial years (July–June). MDL noted that its disclosures are currently prepared for the period January–December each year.

Following some discussion on this point, it was generally agreed that a 30 September 2012 commencement date could be accommodated by GPBs. The Commission would welcome GPBs thinking further on this matter and noted that, if GPBs would prefer to commence regulatory control, assessment, pricing year periods and information disclosure periods on a July–June basis, this should be made clear in their submissions to the Gas DPP Discussion Paper.

Session 4: Conclusions and next steps

Submissions on the Gas DPP Discussion Paper are due on Friday 27 May. These submissions are likely to include reference to quality, non-contiguous networks, and timing periods.

The Commission will advise attendees on 23 May of the date that the workshop minutes will be circulated.

No formal post workshop submissions are requested, but participants are welcome to provide material after the workshop. Following receipt of the Gas DPP Discussion Paper submissions, the Commission will notify attendees of areas where it would particularly value further thoughts on the gas AMP requirements.

A revised set of draft gas AMP requirements, taking into account the workshop discussions, will be circulated prior to the draft determinations being prepared.

The workshop closed at 1pm.

Minutes finalised 3 June 2011

Appendix 1: Workshop Agenda



COMMERCE COMMISSION

**INFORMATION DISCLOSURE REGULATION UNDER PART 4 OF
THE COMMERCE ACT 1986**

**Workshop 1:
Gas Asset Management Plan Requirements**

Venue

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Wellington
Friday 20 May 2011

Participants

Geoff Evans	GasNet
Wayne Armishaw	GasNet
Ian Wilson	GIC
Melanie Leonard	GIC
Don Gray	MDL
Blair Robertson	MDL
Charlotte Littlewood	Powerco
Andrew Stevenson	Powerco
Dan Hynson	Powerco
Peter Thorley	Vector
Ryno Verster	Vector
Barry Parsons	Vector
Karen Murray	Commission
Robert Gordon	Commission
John Groot	Commission
Paul Mitchell	Commission
Paul Ware	Commission

Agenda

8:40am–9:00am **Meet & greet. Coffee & biscuits.**

9:00 **Preliminary session:** **Introductions**

9:10 **Session 1:** **Asset Management Planning by Suppliers of Gas Pipeline Services**

Each participating organisation is invited to present its views on these issues (~5 minutes each) on how gas pipeline businesses use or plan to use asset management plans and the relationship that these plans may have with a regulatory AMP. Consideration should also be given to the main (high level) challenges to regulatory AMP disclosure for GTBs and GDBs.

9:40 **Session 2:** **What should the requirements of an AMP for GTBs and GDBs be?**

Participants should bring with them to the workshop a copy of the prepared discussion draft.³ During this session, participants will work through the discussion draft to assess the relevance of the clauses to GTBs and GDBs and, where appropriate, propose alternative clauses. The discussion draft contains a lightly edited version of the relevant clauses of the EDB disclosure requirements and incorporates relevant material from other regulatory instruments and discussion papers.

10:30 **Morning Tea**

10:50 **Session 2 continued:** **What should the requirements of an AMP for GTBs and GDBs be?**

12:15 **Session 3:** **Timing of the first disclosure of GPB AMPs**

The purpose of this session is to provisionally identify suppliers' concerns regarding (1) the timing and practicability of disclosure of each of the elements of a regulatory AMP for GTBs and GDBs discussed in session 2; and (2) their ability to disclose a regulatory AMP prior to the first disclosure (financial) year commencing after January 2012.

12:45 **Session 4:** **Conclusions and next steps**

³ *ibid*

DISCUSSION TOPICS PROPOSED BY GAS PIPELINE BUSINESSES

Participants were requested to email the Commission a bullet point list of key points that they would like discussed at the workshop. Emails were received from Powerco and Vector, proposing the 13 discussion topics listed below.

Powerco

Item	Discussion topic	Discussion session
P1	The requirement to forecasting load/demand and produce linked capex and opex forecasts out at least ten years. This is more difficult to do for gas compared with electricity. It will also be challenging to link to performance measures.	Session 2. Part 2 section 2.7(1)(b): re 10 year asset management planning period
P2	Interaction of the AMP with the Gas (Safety and Measurement) Regulations, in particular requirements for safety and continuity of supply as overseen by ES/MED and evidenced by audited PSMS and compliance with AS/NZS 4645. It is important to avoid duplication.	Session 2
P3	Clarification of which assets are actually covered in the AMP – we are assuming all gas distribution assets, with the exception of metering (as this is exempt under the Commerce Act).	Session 2 Schedule 4 section 4.5.3c asset categories
P4	Discussion of the cost v benefit of gas AMP – eg gas is smaller/ more competitive than electricity, so need to consider cost and size and what this means for disclosure. For example, a comprehensive AMP could be disclosed every 3 years with compliance assessment by the Commission. In the interim years a shorter report with key updates could be published.	End of Session 1
P5	The possible need to keep some information confidential (due to competition from Nova).	End of Session 2
P6	Disclosing distribution pipeline capacity in AMPs – we have problems generating this information and do not think it is used by anyone.	Session 2 Schedule 5 section 4(2)(d) and 4(4)(c); section 4.5.2(f) re data records

Vector

Item	Discussion topic	Discussion session
V1	SAIDI/SAIFI – validity for a GTB.	Session 2 Schedule 4 section 4.5.4 service levels wrt 4.5.4(a) and Comment 12
V2	Disclosure reporting intervals and timing of the first AMP.	Session 3
V3	Asset categories – rationale for “Valves” and treatment of Main Line Valve stations.	Session 2 Schedule 4 section 4.5.3c(iv) valves, meaning valves other than those located at stations
V4	Disclosure of the numerical factor for additional capacity – validity and usefulness.	Session 2 Schedule 5 sections 3(1)(c), 4(2)(d) and 4(4)(c)
V5	The rationale for reservation-based quality measures (e.g. Total reservations issued by gas gate).	Session 2 Schedule 4 section 4.5.4 wrt Comment 12
V6	How to manage commercially sensitive information, especially relating to transmission.	End of Session 2
V7	Level of reporting for ‘non contiguous’ networks for gas distribution.	Session 2 Schedule 4 section 4.5.3a(iv) peak demand and total quantity of gas broken down by non-contiguous network; section 4.5.3b network descriptions by non-contiguous networks

Appendix 2: Vector Presentation for Session 1



Gas Transmission and Distribution Asset Management Plans

Commerce Commission Workshop

20th May 2011

AMP Background

- Vector publishing electricity disclosure AMPs since start of Commission's disclosure regime
 - Over recent years, AMP considerably extended
 - Comfortable with scope of electricity AMP requirements
- Vector also has internal electricity distribution AMP
 - Largely identical to the disclosure AMP, but
 - ↑ More exhaustive (includes areas with no works in planning period)
 - ↑ Additional aspirational goals and targets
 - ↑ Identifies individual customers
 - ↑ Aligns with Vector budget period (July – June)
 - Key business document for asset investment purposes
 - ↑ Demonstrate asset management supporting Vector vision & goal
 - ↑ Informing internal and external stakeholders
 - ↑ Describing forecast investment and maintenance programmes
 - ↑ Supports innovation & efficiency improvement
- Vector sees great value in effective AMPs

AMP Background

■ Gas Distribution AMP

- High level AMP produced in the past (both UNL and NGC)
- Currently have an exhaustive in-house AMP – mirroring electricity
- Asset management planning dominated by safety, security of supply, growth areas and upgrade of old pipelines
- Focus on safety-related statistics

■ Gas Transmission AMP

- High level AMP produced in the past
- Currently finalising an exhaustive in-house AMP
- Asset management planning dominated by safety, security of supply and limited growth projects
- No significant expansion in past 10 years; some projects now foreseen
 - ↑ Potential step-changes in capital investment required
- Some expensive repairs or replacements in recent years
- Focus on safety-related statistics

Asset Planning Process - Gas Distribution

- Annual detailed planning in response to:
 - Network pressure monitoring and modelling
 - Regulatory compliance (Safety Management standards etc.)
 - Planned urban developments
 - Network performance issues (leaks, low pressure etc.)
 - Programmed upgrade of ageing assets
 - Responding to roading & other utility developments
 - Security of supply enhancements
 - Responding to technology changes
- 10-year indicative planning horizon
 - Highly detailed for first 2 years
 - Good level of details for years 3 to 5
 - Lower accuracy levels for later years

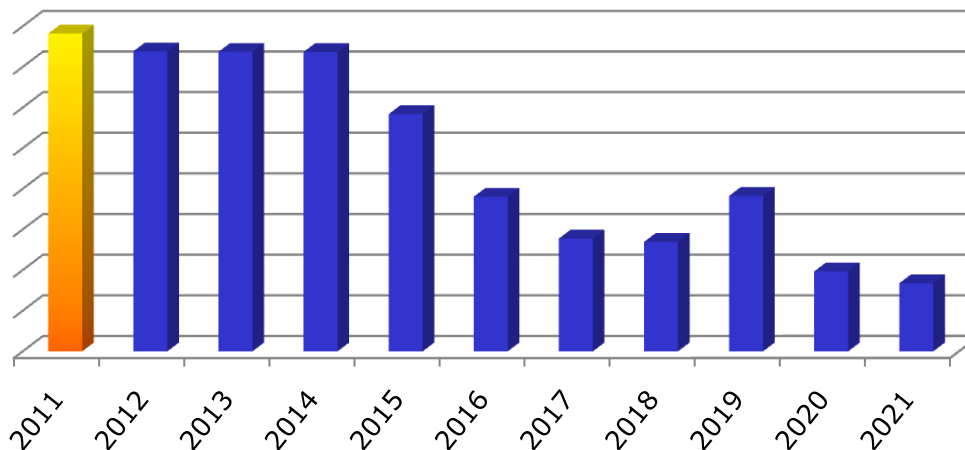
Asset Planning Process– Gas Transmission

- Annual detailed planning in response to:
 - Capacity modelling-constraint issues
 - Gate station capacity
 - Condition monitoring-based replacement/upgrade
 - Reliability/security of supply concerns
 - Roading development (e.g. McKays crossing)
 - Land development – protection and re-routing
 - Technology changes (e.g. SCADA)
 - Regulatory compliance
 - New interconnections
 - Nature – coastal and river erosion, land movement, flooding
 - In-line inspection (pigging) results
 - Expenditure historically split Routine/Non-routine/Exceptional/Capex

Asset Planning Process– Gas Transmission

- 10-year indicative planning horizon
 - Highly detailed for first 2 years
 - Reasonable level of details for years 3 to 4
 - Substantially less information on later years
 - ↑ Mainly internally driven, integrity type work only
 - ↑ Actual budget heavily customer driven – unknown in advance
 - ↑ Small number but high-value projects

Gas Transmission Capex - 10-year plan



Notes :

- Indicative figures only
- Excludes northern system reinforcement

Specific Issues- Gas Distribution

- Safety is the primary driver, followed by network capacity
- Some underground steel assets – difficult to predict where and when corrosion or damage will occur. Non-linear over the asset life.
- Limited flow and pressure data
- Susceptible to 3rd party damage
- Capacity very dynamic – cannot be simply described (very simplified in Capacity Disclosure)
- Unlike electricity, gas is a discretionary fuel so more difficult to forecast system growth into new developments

Specific Issues- Gas Transmission (1)

- Safety is the primary driver – far higher potential consequences than electricity transmission or distribution system
- Underground steel asset – difficult to predict where and when corrosion or damage will occur. The rate of failure is non-linear over the asset life.
- Intelligent pigging, (part of wider pigging programme) every 5-10 years may reveal, otherwise hidden major issues
- Little or no control over demand growth. Dominated by high consumption from very small number of customers (thermal generators – (Otahuhu B represents > 50 years of organic growth on the Auckland network)
- Long asset life & long construction periods
- Susceptible to erosion, loss of river banks, slips – very difficult to predict when this will occur
- Susceptible to 3rd party damage – with large repair costs

Specific Issues- Gas Transmission (2)

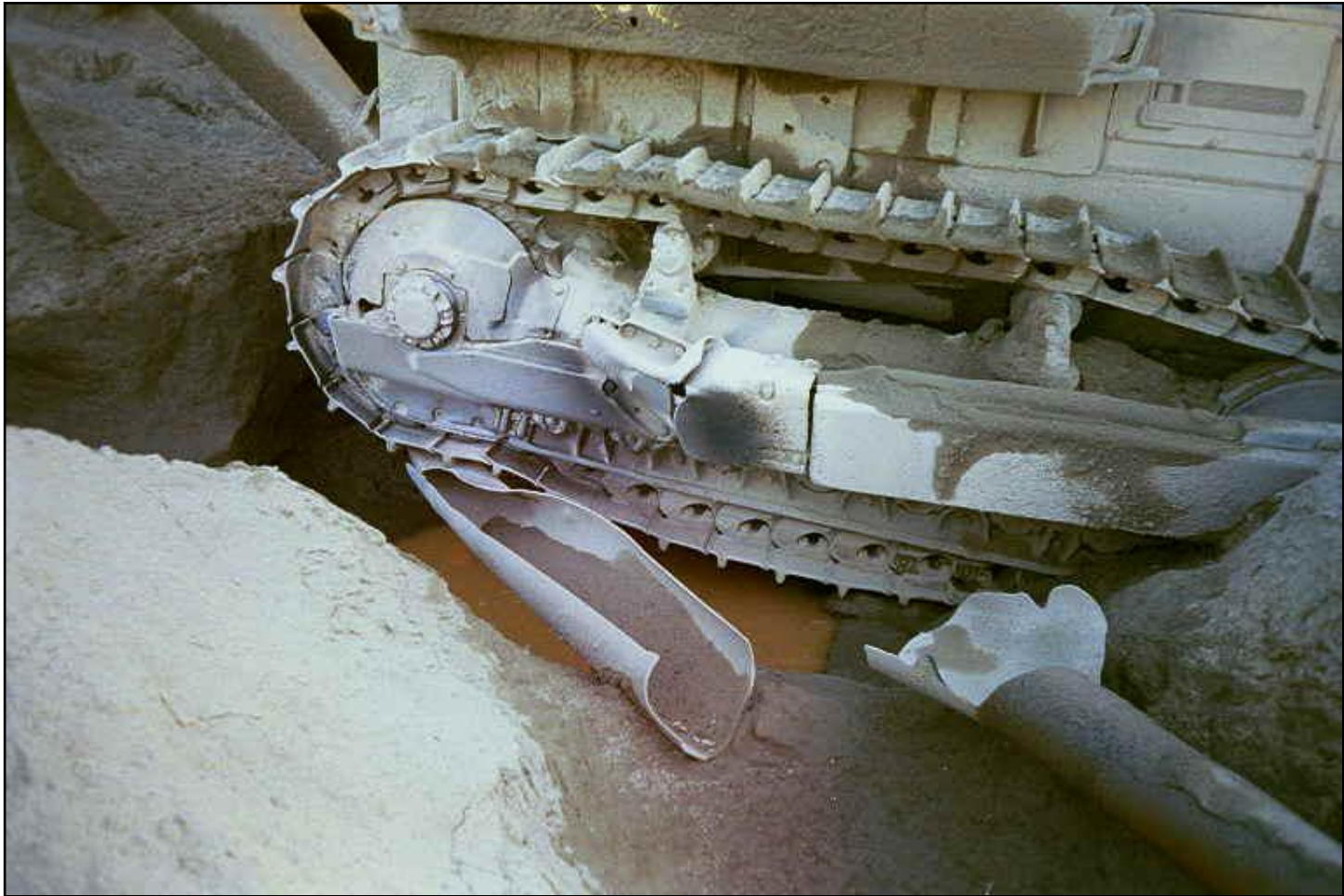
- Capacity is very dynamic due to line pack and demand patterns – cannot be simply described (very simplified in Capacity Disclosure)
- Gas turbines - high value assets that can catastrophically fail
 - System capacity highly dependent on these assets
- Exposure to urban development – forces higher protection standards on Vector
- Very large swings in annual expenditure
- Small industry – resource availability often impacts on the deliverability of projects
- Investments are lumpy and infrequent; recovery of investment is uncertain

Accurate future expenditure planning is problematic, and not in Vector's control. Costs can be very lumpy.

Coastal Erosion



Mechanical Damage



Quality standards – gas distribution

- Reporting required measures to the Commerce Commission
 - Generally comfortable with this
 - Some data-issues may arise in non-controlled networks
 - SAIDI/SAIFI – interruptions to consumers very rare, so single incident can have major impact on figures (lumpy quality measure)
 - SAIDI – outage durations can be protracted due to purging/relighting

Quality standards – gas transmission

- SAIDI/SAIFI – interruptions to consumers very rare (line pack & underground asset), but potential for large numbers – very lumpy quality measure
- ERT – real transmission emergencies often don't involve emergency services – remote locations. Emergency services often respond to 'false emergencies' – odorant filling, controlled gas venting.
- Transmission pressure – the ultimate quality measure for the transmission system, but in many cases outside the control of the TSO.
- Reliability – transmission predominantly un-looped, but inherently reliable. Compressor stations (with some exceptions) have N-1 redundancy. Reliability focus should be on the availability of N-1 at key compressor stations.
- Reservations – reserved capacity \neq physical pipeline capacity, it accounts for diversity
- Usefulness of gas demand data for every hour / number of users?

Comments on proposed AMP scope

- Generally well aligned with Vector's direction, but note the following:
 - Limited flow data within gas distribution networks – pressure profiles used as a proxy for demand profiles
 - Demand characteristics – limited data available at a DRS level
 - Transmission peak demand influenced by line pack (peak consumption \neq peak gas flow into a network)
 - Non-contiguous network definition (4.5.3(a)iv)?
 - Expectation for non-network solutions? Significantly less scope than on electricity networks (smart metering, ripple control etc.)
 - Flexibility essential in planning for renewal/refurbishment (4.5.6d) – rivers and coasts don't erode in a predictable fashion
 - Flexibility also essential around customer-driven investments
 - Evaluation of performance (4.5.8) – as a new AMP, some asset performance data will not be available early on
 - Numerical factor for increase in capacity (p20 & 21) – very subjective number, of little value to pipeline users
 - How to treat confidential customer information in disclosed document?



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