RISK MANAGEMENT REVIEW
NZ GAS PIPELINE BUSINESSES

New Zealand Commerce Commission | Oct 2019

Risk Management Review of Gas Pipeline Businesses

Client: Commerce Commission New Zealand

Co No.: N/A

Prepared by

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04-Oct-2019

Job No.: 60602000

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Quality Information

Document   Risk Management Review of Gas Pipeline Businesses

Ref   60602000

Date   04-Oct-2019

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Reviewed by   Stephen Garlick

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	31-May-2019	Draft for Review	Ian Martin Area Manager, Wellington	
0	04-July-2019	Draft Pending GPB Feedback	Ian Martin Area Manager, Wellington	
1	08-Sept-2019	Final	Ian Martin Area Manager, Wellington	
2	17-Sep-2019	Final - Minor Amendments	Ian Martin Area Manager, Wellington	
3	04-Oct-2019	Final - Minor Amendments	Ian Martin Area Manager, Wellington	

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Executive Summary

AECOM New Zealand Ltd (AECOM) was commissioned by the Commerce Commission New Zealand (the Commission) to review and assess the risk management practices of the five gas pipeline businesses (GPB) that are subject to economic regulation in New Zealand. These businesses are:

- Transmission GPB – First Gas Transmission

- Distribution GPBs:

  - First Gas Distribution;

  - Vector;

  - Powerco;

  - GasNet.

This review assessed GPBs risk management practices against leading practice statements linked to established and accepted asset management frameworks. Risk management is an integral component of most aspects of asset management planning. Risk management practice has therefore been assessed within the broader context of asset management planning. This is reflected in the breadth of the leading practice statements adopted. The review assessed processes and practices, as well as the overarching organisational commitment and the underpinning data and systems with a focus on risks associated with security of supply. It did not review the specific outputs of these functions, nor did it review organisational performance.

Figure 1   Origins of composite framework used

Risk management frameworks provide GPBs with the basis for identifying, assessing and managing risks. The intent of this review is to aid investigation into how effectively and efficiently GPBs are supplying the regulated services and promote greater understanding amongst interested stakeholders of their performance[1]. We note the report will be published and available to a general audience.

This information then contributes to the Commission's overall assessment of the GPBs approach to managing their networks so that the required levels of service are delivered to their stakeholders now and into the future[2].

One of the fundamentals of good asset management is to adopt practices which best reflect the size, nature and risk associated with the organisation, the services it provides, and the assets owned and managed to enable these services to be delivered. Comparison has therefore been made of current practice to "best appropriate" practice. This "best appropriate" level has been assigned by AECOM based on experience gained over a long history of undertaking similar reviews for numerous capital-intensive organisations.

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[1] Refer also Section 1.3

[2] In parallel to this assessment, a specific and more detailed review of First Gas Transmission's approach to managing geotechnical risks was undertaken. The outcomes of this assessment are presented within the report "First Gas Transmission Pipelines, Geohazard Risk Management Review" (AECOM June 2019).

Risk Management Aspects Assessed

The adopted framework enabled the systematic assessment of the following aspects:

- **Asset knowledge**, the appropriateness, reliability and accessibility of data and the processes associated with the use and maintenance of asset data;

- **Strategic planning processes**, the processes used in the implementation of risk-focussed asset management activities including failure planning, risk management and criticality;

- Current risk-focussed **asset management practices** including operations and maintenance management;

- **Information systems** to support risk-focussed asset management processes and store/manipulate data;

- **Organisational tactics** including organisational commitment and support.

Key Findings

This assessment has found that the GPBs are approaching a best appropriate level of risk management based on the size and nature of the specific organisations, the services they provide, and the size and nature of the infrastructure that enables these services to be delivered. Many processes are at this level already, and the GPB's have already identified and commenced many of the improvement activities required to achieve best appropriate practice in the remaining areas. This is typical of the ongoing development nature of asset management.

Noting that good asset management practices are the principal means to effectively manage asset risks, the review found that asset and risk management practices across the five organisations assessed were reasonably consistent. This reflects the regulatory requirements placed on them, and the adoption of technical standards which are prescriptive in nature.

Asset knowledge and the systems to manage this information were the highest scoring categories across all GPBs, with strategic planning processes scoring the lowest. The figure below presents the comparative findings across each of the risk management practice "categories" against the overall maximum and overall minimum best appropriate practice[3] levels.
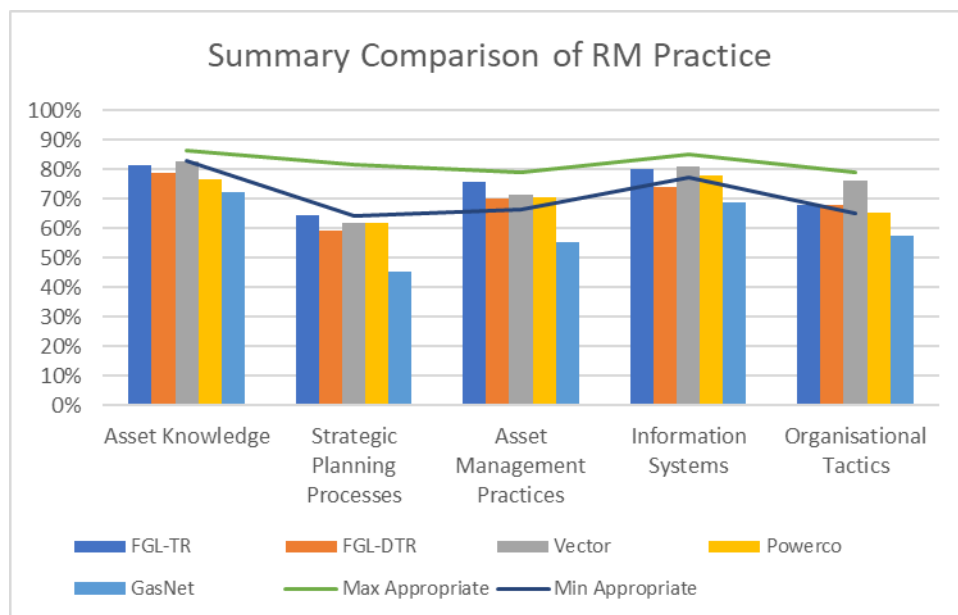
Figure 2   Summary comparison of risk management practice (by RM category)

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[3] Refer Section 3.1.1

Key strengths identified in each of the GPBs are:

- **First Gas**. The transmission business had a strong and demonstrated use of systems and risk principles to drive actions. There was clear evidence throughout the FGL offices that risk was a high priority, and that there was a strong culture of continuous improvement across both the transmission and the distribution businesses.

- **Vector**. There was clear evidence that risk management is widely recognised as a core aspect of Vector's business. Vector's organisational structure, risk-specific role provision and broad consideration of risk (including organisational resilience) was identified as an aspect of particular strength.

- **Powerco**. Powerco's demand modelling was identified as an aspect of particular strength. Although Risk Management Consultation was scored notably lower than other aspects, Powerco has specifically attempted to explore customer expectations of continuity of supply and willingness to pay for increased reliability.

- **GasNet**. GasNet has some key staff who have had a significant influence within the gas sector. They bring a pragmatic and technical approach to the management of their networks and risks associated with them.

Risk Aspects of Particular Importance

The Commission identified the following as key aspects of risk management that required review. These aspects have been included within the review and specifically commented on in Section 4.0 for each of the GPBs. These are summarised below:

Key Aspect	Comment
Asset criticality	Although critical assets are identified, aspects considered within frameworks in place for doing so were found to be somewhat narrow, linkages to the established risk management frameworks weren't always clear and means to systematically apply them across the organisation to ensure consistency could be strengthened
Resilience	First Gas is working to identify vulnerable areas and define implications to the transmission network, particularly with regards to geotechnical risk. When complete, this will enable a systematic and formal articulation of network resilience profile. Distribution network risks tend to be focussed on materials and integrity aspects and there are is no systematic and/or formal articulation of the network resilience profiles. Although some work has been undertaken on understanding organisational resilience and preparedness across all of the GPBs, this is more of a risk-type approach. Use of a self-assessment tool, such as OrgRes, would enable a better understanding of this aspect
Cost benefit analysis	Cost benefit analysis is used within decision making, particularly for significant projects, although broader social, environmental and financial aspects are not consistently considered and/or applied across each of the organisations. GasNet did not routinely use cost-benefit analysis within risk-based decision making. Specific optimisation of risk treatment options is currently a manual process although work is in progress within Powerco to establish systems to automate this.
Asset data accuracy	Provided that the GPBs continue their deliberate and ongoing data review and improvement activities, we consider that asset data completeness and accuracy is broadly at an acceptable level. We believe that GasNet in particular still has some work to do in this area.

Key Aspect	Comment
Customer expectations	Although stakeholders are identified and some work has been done to engage customers in discussions around security of supply risks, very little has been done in quantifying this and understanding their "willingness-to-pay";

Specific Industry Context Observations

The industry context referred to in Section 1.3 makes specific reference to the following four aspects. While these were not specifically assessed as such, we make the following observations:

- **Recent change in ownership of the transmission network**. First Gas recently inherited the networks, data, systems and risks from other organisations. They have worked to review these aspects and we believe have made excellent progress to understand the assets and data, to adopt appropriate processes and systems, and to identify and manage risks. We believe that the quality of data is likely to have declined slightly as new systems have been established. However, we believe that this is being progressively addressed in a deliberate manner and, as such, does not represent a significant risk.

- **Recent government initiatives**. Zero Carbon Bill, establishment of a Climate Commission and ban on new offshore exploration rights will affect the way the GPBs manage their networks. All GPBs recognise this as a key driver, include these aspects within their corporate risk registers and are committed to the promotion of the continued use of gas as a viable energy source.   In addition, both Vector and Powerco have commenced work to understand the impacts and opportunities for their networks from changing technologies. In broad terms, all assessed GPBs are continuing to manage their networks considering long-term service provision.

- **Proposed customised price-quality path (CPP)**. We believe First Gas understands the additional rigour required to successfully navigate the CPP requirements.

- **Resilience awareness**. While First Gas had a reasonable understanding of the remaining life of its transmission network and progressing its understanding of the network's resilience, the distribution businesses were less advanced with regards to high impact low probability (HILP) events. Although a range of impact areas are considered, distribution network risk processes tend to be driven by more tangible integrity aspects with a human safety focus, and resultant programmes of work address industry-wide issues such as pre-1985 polyethylene pipe material. No GPB has a good understanding of its organisational resilience, although Vector has developed specific strategies around organisational strengthening.

Consolidated Gaps in Risk Management Practice

Key gaps which we believe should be closed are identified below. The assessment found a number of other gaps as presented for each GPB within Section 3.0, although these were less significant in nature. We believe that the absolute achievement of zero gaps should not be slavishly followed without a business decision considering the benefits and costs of doing so, noting that the closing of some of these gaps would have an insignificant impact on the overall score and, more importantly, on the overall performance of the organisation. This assessment framework provides a systematic and repeatable basis for evaluating the appropriateness of current practice, but the level of preciseness of scoring is not absolute.

Key gaps for all GPBs are, in order of significance:

- **Gaps of High Significance:**

  - Limited understanding of what security of supply risk external stakeholders consider acceptable and associated engagement with the stakeholders;

  - Although there is a reasonable understanding of infrastructure failure profiles and renewal needs in the first ten years, there is limited understanding of these aspects in the longer-term.

  - Limited articulated understanding of distribution network resilience.

- **Gaps of Moderate Significance:**

    - A slightly narrow focus to the network risk management. This reflects the adoption of technical standards with somewhat prescriptive risk management approaches. Although consequence impact areas rated include aspects beyond health and safety, the events themselves tend to have been identified within an overall network integrity/public safety context. Given that this complies with accepted standards, we cannot say that it is inadequate as such. However, we believe an approach which is tied clearly to the broader asset management objectives would strengthen the GPBs' risk management;

    - Limited systematic optimisation[4] of activities addressing risks and/or drawing on risk principles which should consider impacts on external stakeholders and triple bottom line[5] aspects;

    - Although critical assets are identified, aspects considered within frameworks in place for doing so were found to be somewhat narrow, linkages to the established risk management frameworks weren't always clear and means to systematically apply them across the organisation to ensure consistency could be strengthened;

    - Some systems are not integrated to exploit their ease of use and functionality;

    - As is typical with owners of linear network assets, there remain some data gaps and inconsistencies. All GPBs understand this and have focussed and ongoing programmes to improve data quality. Provided these programmes continue we do not believe these gaps represent a significant risk;

    - Although some work has been undertaken on understanding organisational resilience and preparedness, this is more of a risk-type approach. Use of a self-assessment tool, such as OrgRes[6], would enable a better understanding of the organisational resilience.

We believe that gaps remaining following the completion of the improvement activities currently underway should be reasonably straightforward to address.

Recommendations

1. **Develop improvement plans.** This review identifies gaps between current practice and our assessment of best appropriate practice for each of the organisations. We recommend each of the organisations develop a detailed, resourced and prioritised improvement plan to close these identified gaps. This could be undertaken within the Asset Management Plans.

2. **Confirm appropriate level**. There is a correlation between sophistication of approach and cost and effort to accomplish this. We therefore consider that the "best appropriate" level should be confirmed by each GPB by quantifying the costs involved in closing the identified gaps and considering these costs against the benefits and/or risks of not doing so.

3. **Routine reporting against improvement plans**. We recommend routine reporting of asset and risk management improvement plan progress to provide the Commission with confidence that the GPBs actually undertake the improvements they have said they will. This could be undertaken within the Asset Management Plans.

4. **Consider supplementary assessments**. This assessment is limited to the processes and practices, the underlying data and systems, and the overarching corporate commitment. It does not assess actual performance, outputs and outcomes. We recommend that performance benchmarking is considered to supplement the outcomes of this assessment and the routine regulatory reporting requirements[7].

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[4] Prioritisation and selection of the best option
[5] Social, environmental and economic aspects
[6] http://orgrestool.resorgs.org.nz/
[7] Similar to water sector benchmarking undertaken by Water New Zealand and Water Services Association of New Zealand

5. **Consider re-assessment**. The GPBs could be reassessed using this framework, or a rolled-up version of it in three years' time. We consider three years is a reasonable timeframe to achieve the improvements required to close most, if not all of the identified gaps to a level where the Commission should have confidence the processes, underlying data and systems, and overarching corporate commitment are at a best appropriate level.

1.0   Introduction

1.1   The Assessment

AECOM New Zealand Ltd (AECOM) was commissioned by the Commerce Commission New Zealand (the Commission) to review and assess the risk management practices of the five gas pipeline businesses (GPB) that are subject to economic regulation in New Zealand. These businesses are:

- Transmission GPB – First Gas Transmission.

- Distribution GPBs:

    - First Gas Distribution;

    - Vector;

    - Powerco; and

    - GasNet.

This review assessed GPBs risk management practices against leading practice statements linked to asset management frameworks such as those documented in IS0 55001 and the International Infrastructure Management Manual (IIMM), risk management standards such as ISO 31000, and relevant technical standards such as NZS 7901, AS/NZS 2885 and AS/NZS 4645[8]. Risk management is an integral component of most aspects of asset management planning. Risk management practice has therefore been assessed within the broader context of asset management planning. This is reflected in the breadth of the leading practice statements adopted.

The review assessed processes and practices, as well as the overarching organisational commitment and the underpinning data and systems with a focus on risks associated with security of supply. It did not review the specific outputs of these functions, nor did it review organisational performance. Therefore, while we did not identify any significant anomalies within the risk registers, an assessment of the appropriateness of the controls was outside the scope of this review.

Specific aspects of risk management that were included within the review include:

- **Asset criticality**. Understanding the criticality of individual assets is important to understanding the risks of network failure and where resources are required and best allocated to meet customers expected security of supply.

- **Resilience**. Resilience of a network against high impact low probability (HILP) events is an important quality aspect of a regulated network and has recently, following the 2016 Kaikoura earthquake, become an area of focus for network owners and regulators.

- **Risk-based decision making**. Cost benefit analysis is a useful tool for assessing responses for some identified risks, including resilience to HILP events.

- **Asset data accuracy**. Asset management practices are reliant on quality asset data.

- **Customer expectations**. Network owners manage network risk on behalf of customers which involves a trade-off between cost and risk mitigation.

1.2   Why the Assessment was Undertaken

Risk management frameworks provide GPBs the basis for identifying, assessing and managing risks. The intent of this review is to aid investigation into how effectively and efficiently GPBs are supplying the regulated services and promote greater understanding amongst interested stakeholders of their performance. We note the report will be published and available to a general audience.

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[8] NZS 7901: Electricity and gas industries – Safety management systems for public safety
AS/NZS 2885: Pipelines – Gas and liquid petroleum (Part 6: Pipeline safety management)
AS/NZS 4645: Gas distribution networks (Part 1: Network management)

This information then contributes to the Commission's overall assessment of the GPBs approach to managing their networks so that the required levels of service are delivered to their stakeholders now and into the future.

1.3   Background Context

GPBs in New Zealand are subject to information disclosure and price-quality regulation under Part 4 of the Commerce Act 1986 (Act). The purpose of information disclosure requirements is to ensure that sufficient information is readily available to interested persons to assess whether the Part 4 purpose is being met. Under the information disclosure requirements, GPBs are required to publicly disclose an asset management plan (AMP) or AMP update each year. The AMP provides information on how the business intends to manage its network assets.

Under the Commission's summary and analysis powers it may monitor and review disclosed information for the purpose of promoting greater understanding of the performance of individual regulated suppliers. More generally, the Commission also has powers to investigate how effectively and efficiently any regulated supplier is supplying regulated services.

Given the following recent industry developments, the Commission recognised value in looking specifically at GPBs risk management practices.

- Recent change in ownership of transmission network. In April 2016, First Gas took control of Vector Limited's gas transmission network and gas distribution assets located outside of Auckland. In June 2016 they also acquired Maui Development Limited's gas transmission network, resulting in First Gas owning all the transmission assets in New Zealand.

- Recent new government initiatives. Zero Carbon Bill, establishment of a Climate Commission and ban on new offshore exploration rights are matters currently being considered by the gas industry.

- Proposed customised price-quality path (CPP). First Gas has indicated its intention to apply for a customised price-quality path (CPP) for its gas transmission business in August 2021. The CPP may allow them to recover, through increased prices, costs to address a geohazard risk at Whitecliffs. First Gas has also identified a number of other geohazard areas on their transmission network which they are actively monitoring.

- Resilience awareness. The 2016 Kaikoura earthquake in New Zealand has raised awareness in New Zealand of the importance of network resilience.

The Commission regulates GPBs in conjunction with other organisations including the Gas Industry Company (GIC) and WorkSafe. GIC is the 'industry body' under Part 4A of the Gas Act 1992 responsible for recommending arrangements to improve the operation of the sector to the Minister of Energy and Resources. WorkSafe is the government agency that is the workplace health and safety regulator.

1.4   Links to Other Reports

In parallel to this assessment, a specific and more detailed review of First Gas Transmission's approach to managing geotechnical risks was undertaken. The outcomes of this assessment are presented within the report "First Gas Transmission Pipelines, Geohazard Risk Management Review" (AECOM September 2019).

2.0   Assessment Approach

2.1   Overview

This review consisted of the following key steps:

- **Assessment framework**. We developed a systematic, repeatable and comprehensive framework of leading risk management practices.

- **Information review**. We reviewed documentation relevant to the individual GPBs approach to risk management.

- **Structured discussions**. We held structured discussions with key staff within each of the GPBs to clarify aspects of the document review and enable a deeper understanding of the risk management approaches established.

- **Gap analysis**. We populated the framework with summary descriptions of current practice alongside each leading practice statement. Current practice was scored and compared with a target score representing the level which we believe is "best appropriate" for the GPB, based on our extensive experience in assessing organisations asset and risk management practices.

- **Interpretation and reporting**. We interpreted the analysis and documented the findings in this report.

The core assessment team comprised of a strategic asset management and risk management specialist, an asset management and risk management data and systems specialist, and a gas industry specialist. A Commission specialist attended the on-site discussions with the core assessment team. Supporting this core team were asset management and risk management specialists from Australia, the United Kingdom and Canada, consultation and engagement specialists, resilience specialists and decision-making specialists.

These steps are more fully described below.

2.2   Assessment Framework

The assessment framework was developed drawing on the following established industry-leading practice review frameworks from around the globe:

- Asset management maturity framework presented in Table 2.1.2 of the International Infrastructure Management Manual (NZ and Australia);

- Institute of Asset Management Self-Assessment Methodology (UK);

- Water Services of Australasia AMCV Framework (Australia);

- Asset Management British Columbia – AM Roadmap (Canada); and

- Water Research Foundation – Leading Practices in Strategic Asset Management (US).

AECOM's global asset management, risk management and consultation and engagement specialists, as well as gas technical specialists, provided input to the framework to provide confidence that it represented internationally appropriate practice, reflected ISO 55001 and ISO 31000, reflected the established and relevant technical standards (AS 7901, ASN/ZS 2885 and AS/NZS 4645) and was appropriate to the gas pipeline industry in New Zealand.

Figure 3   Origins of composite assessment framework used

The 207 leading practice statements within this comprehensive framework enabled a systematic and repeatable assessment of the GPBs':

- asset knowledge, the appropriateness, reliability and accessibility of data and the processes associated with the use and maintenance of asset data;

- strategic planning processes, the processes used in the implementation of risk-focussed asset management activities including failure planning, risk management and criticality;

- current risk focussed asset management practices including operations and maintenance management;

- information systems to support risk-focussed asset management processes and store/manipulate data; and

- organisational tactics including organisational commitment and support.

Figure 4   Risk management practice categories adopted

The resultant framework is presented in Figure 5 below. Full details of the assessment scores are presented in the Appendices.
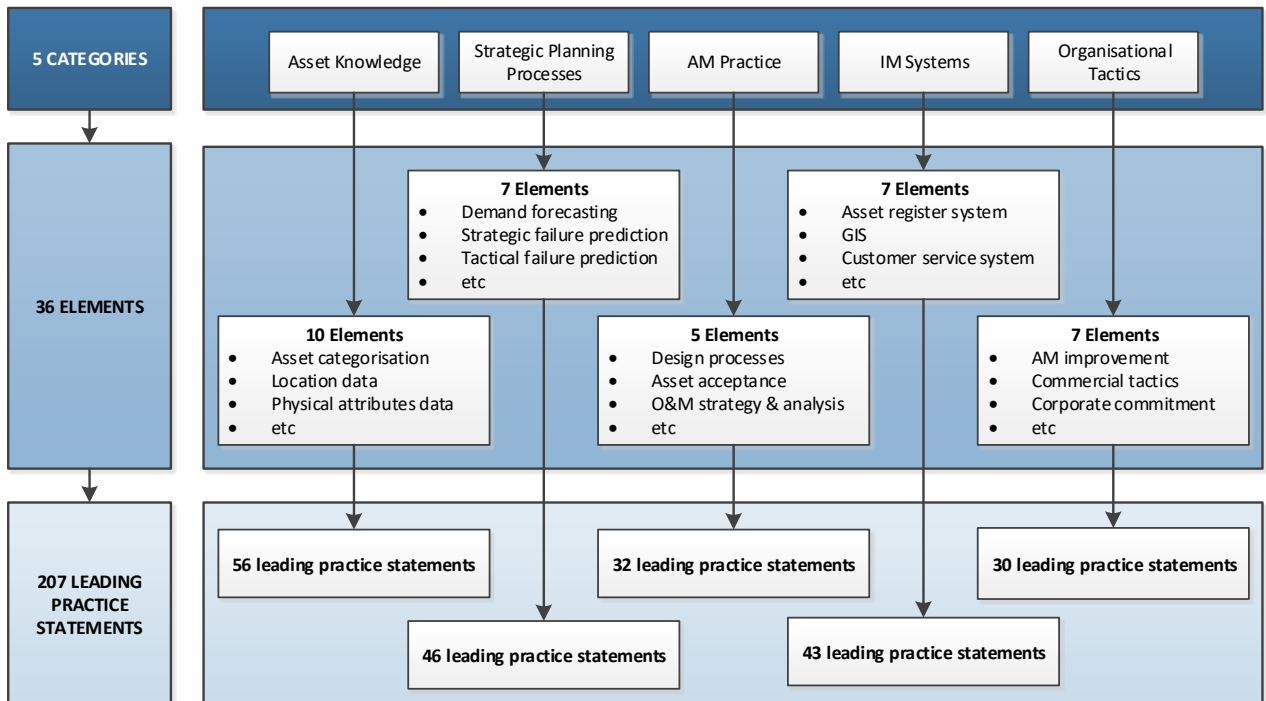
Figure 5   Assessment framework schematic

2.3   Scoring the Assessments

Each of the 207 leading practice statements are weighted, reflecting the importance that we believe they have within their "Element", and each "Element" has been assumed to be of equal importance when considering the findings at the "Category", or overall level.

Current practice and best appropriate practice[9] scores were each assigned to every statement within the framework on a 1-6 scale by the assessment team. The scores are subjective and reference the scoring guidelines presented in Appendix F.

Difference in scores between current and best appropriate practice are defined as "gaps". These are individually identified in Section 3.0 and graphically presented considering their weightings.

2.4   Information Review

Information reviewed included:

- asset management policies, strategies and plans;

- risk management policies, frameworks and procedures; and

- decision-making frameworks.

This information enabled the assessors to gain an understanding of the individual GPB's approach to risk management, and an indication of the priority of this within each organisation. More importantly, it guided the subsequent on-site discussions.

2.5   On-Site Discussions

On-site discussions were held over a full day with relevant staff within each GPB. This supplemented information gleaned from the information review

Figure 6   Key aspects considered in the assessments

stage and enabled an objective view to be formed on how each GPB manages risk against each of the "leading practice statements" within the assessment framework. As part of these discussions, evidence was requested and sighted for some processes, systems and practices where clarification was required. Further, each GPB demonstrated its relevant systems and allowed its data to be sighted during these sessions.

2.6   Gap Analysis

The information gleaned was then interpreted and the assessment completed within the framework as a "gap analysis". This analysis scored current practice against "best international practice", as well as compared this to our assessment of "best appropriate practice" for each of the 207 leading practice statements.

Descriptions of current practice were forwarded to each of the GPBs for review and feedback to ensure that the interpretation of the information provided and supplementary discussions was correct. Feedback has been incorporated where appropriate and further evidence sighted where required.

Details of the assessment gap analysis are presented in the Appendices.

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[9] Refer 3.1.1

2.7   Report

The findings of the review and assessment were consolidated, interpreted and documented within this report. Relevant extracts from the report relating to the findings have been reviewed by each of the GPBs. The full report has been subject to internal review and verification within AECOM, as well as review by the Commission prior to its finalisation.

3.0   Assessment Findings

3.1   Overview

3.1.1   Current, Best Appropriate and Best Practice

The leading practice statements within the framework have been sourced from many international industry-leading frameworks. By definition these statements therefore represent "international best practice", that is, the best practice that is being applied or developed somewhere in the world[10]. A score of 100% against each of these statements would therefore imply the GPB is achieving international best practice.

One of the fundamentals of good asset management is to adopt practices which best reflect the size, nature and risk associated with the organisation, the services it provides, and the assets owned and managed to enable these services to be delivered.

Therefore, we believe the comparison of current practice to "best appropriate" practice is more useful. This "best appropriate" level has been assigned by AECOM based on experience gained over a long history of undertaking similar reviews for numerous capital-intensive organisations. Appropriate practice means that we believe the practices, approach, data and systems adopted:

- are generally consistent with industry practice;
- are generally consistent with similar organisations which own and manage linear networks;
- comply with applicable standards;
- represent a pragmatic approach and balance cost and effort with benefit; and
- are being monitored and progressively improved, noting that expectations and requirements generally increase over time.

Best appropriate practice recognises this fundamental requirement for continuous improvement and identifies the level we believe is required within the short-term (typically three years).

There is a correlation between sophistication of approach and cost and effort to accomplish this. While we have used our knowledge and judgement based on extensive experience to assign "best appropriate practice" score thresholds within this framework, we recommend that this should be confirmed by each GPB by quantifying the costs involved in closing the identified gaps and considering these costs against the benefits and/or risks of not doing so.

3.1.2   Overall Findings

Overall findings are described in Sections 3.2, which compares the results across the different GPBs, and in Section 4.1 which presents the overall results and trends.

3.2   Inter-Organisation Comparison

Asset and risk management practices across the five organisations assessed were reasonably consistent. This reflects the regulatory requirements placed on them, and the adoption of technical standards which are prescriptive in nature.

Figure 7 indicates the relative positions of each of the organisations across the five categories assessed, noting that the green line represents the highest level of "best appropriate practice" (for the larger organisations with larger, more complex and more critical networks) and the blue line represents the lowest level of "best appropriate practice" (for the smaller organisations with smaller, less complex and less critical networks). In broad terms, the level of risk management practice adopted reflects the size and criticality of the organisations themselves, and their networks and services provided. Asset

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[10] As identified by the developers of the frameworks, which have in turn been endorsed by credible internationally recognised organisations and the wider industry

knowledge and the systems to manage this information were the highest scoring categories, with strategic planning processes scoring the lowest.

All organisations had gaps identified to reach a level of risk management we believe is best appropriate for them. All of the organisations have identified a programme of ongoing improvements to their risk management practices which, when completed, will get many of those aspects that currently lag to a best appropriate level. This report identifies these, and other gaps which we believe should be closed. Provided the GPBs consolidate these into their improvement programmes and complete them as planned, then we do not believe that this is a significant issue.

Further, we believe this reflects a continuous improvement approach, one of the fundamental cornerstones of sound infrastructure management. This means that absolutes at any given time can be difficult to categorically define without the risk of stifling innovation and improvement.
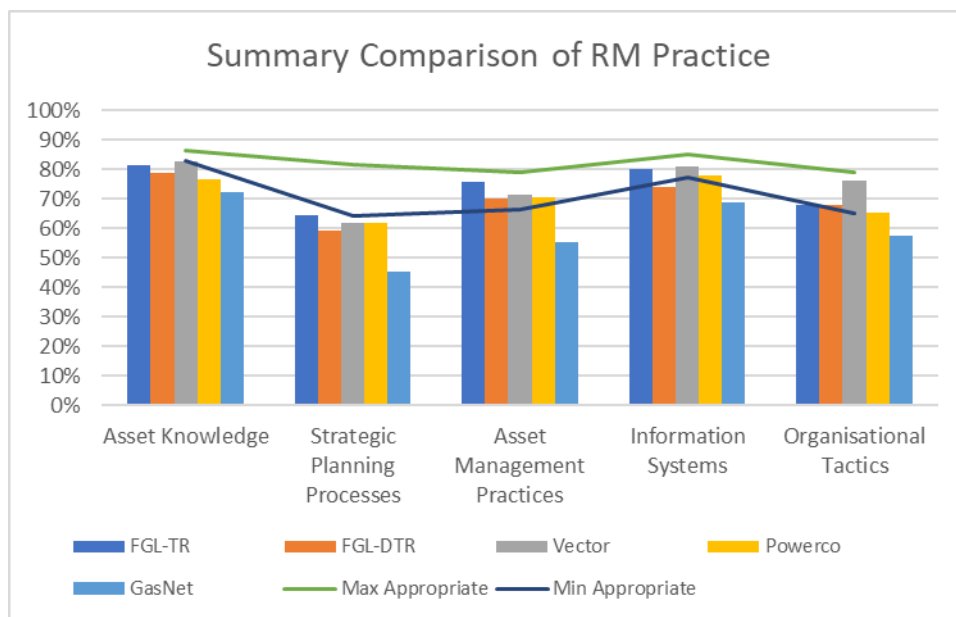
Figure 7   **Summary comparison of risk management practice**

First Gas Transmission is the highest scoring, or close to the highest scoring organisation within each of the categories, and GasNet the lowest. However, when compared to the best appropriate level for them (as determined by the "gap") then GasNet scores relatively better than this in terms of Strategic Planning Processes and Organisational Tactics as shown in Figure 8 overleaf. Vector's strong organisational structure and processes are reflected in the Organisational Tactics category.
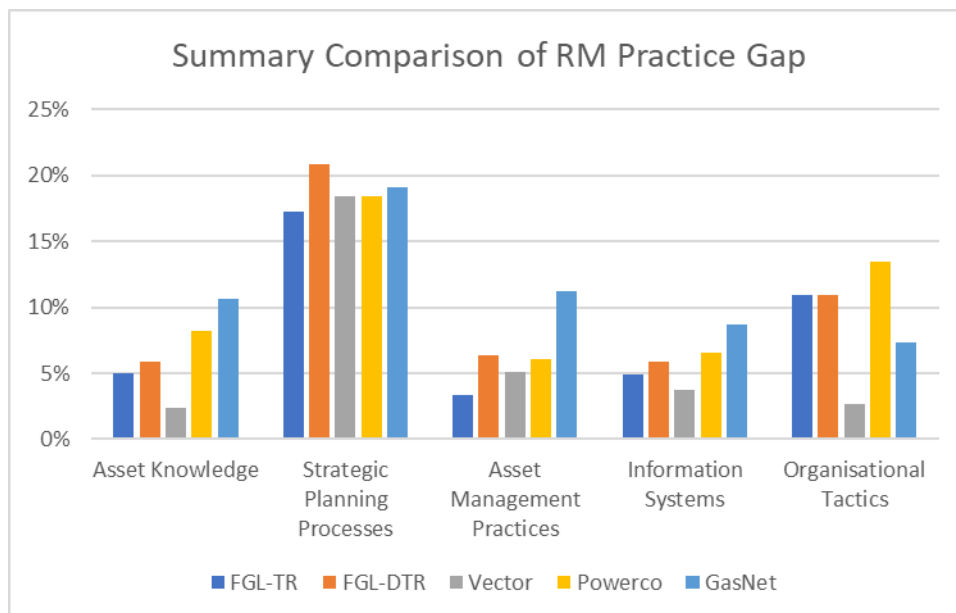
Figure 8   Summary comparison of risk management practice gap

Key strengths identified in each of the GPBs are:

- **First Gas**. The transmission business had a strong and demonstrated use of systems and risk principles to drive actions. There was clear evidence throughout the FGL offices that risk was a high priority, and that there was a strong culture of continuous improvement within both the transmission and distribution businesses.

- **Vector**. There was clear evidence that risk management is widely recognised as a core aspect of Vector's business. Vector's organisational structure, risk-specific role provision and broad consideration of risk (including organisational resilience) was identified as an aspect of particular strength.

- **Powerco**. Powerco's demand modelling was identified as an aspect of particular strength. Although Risk Management Consultation was scored notably lower than other aspects, Powerco has specifically attempted to explore customer expectations of continuity of supply and willingness to pay for increased reliability.

- **GasNet**. GasNet has some key staff who have had a significant influence within the gas sector. They bring a pragmatic and technical approach to the management of their networks and risks associated with them.

3.3   First Gas Transmission

3.3.1   Context

First Gas Limited is owned by First State Funds, part of the Commonwealth Bank of Australia's group of companies. First State Funds comprises two infrastructure funds managed by First State Investments. First State Investments (known in Australia as Colonial First State Global Asset Management) is a leading global infrastructure asset manager, overseeing approximately $240 billion of infrastructure assets across Australia, New Zealand and Europe.

On 20 April 2016, First Gas took control of Vector Limited's gas transmission assets (along with Vector's gas distribution assets located outside Auckland). In a separate transaction, First Gas took ownership of Maui Development Limited's gas transmission assets on 15 June 2016.

First Gas owns and operates a gas transmission system consisting of underground pipelines, compressor facilities and above ground stations in the North Island of New Zealand. The transmission system incorporates both the Maui and non-Maui transmission pipelines, as set out in Figure 9 below.

The transmission system is 2,511 kilometres in length, with approximately 137 kilometres installed in urban areas and the remainder in rural areas. The nominal internal diameter of the pipelines ranges from 50mm to 850mm, with the majority installed below ground. The pipelines connect 252 stations that contain a range of equipment designed to receive, transmit and deliver gas to customers.
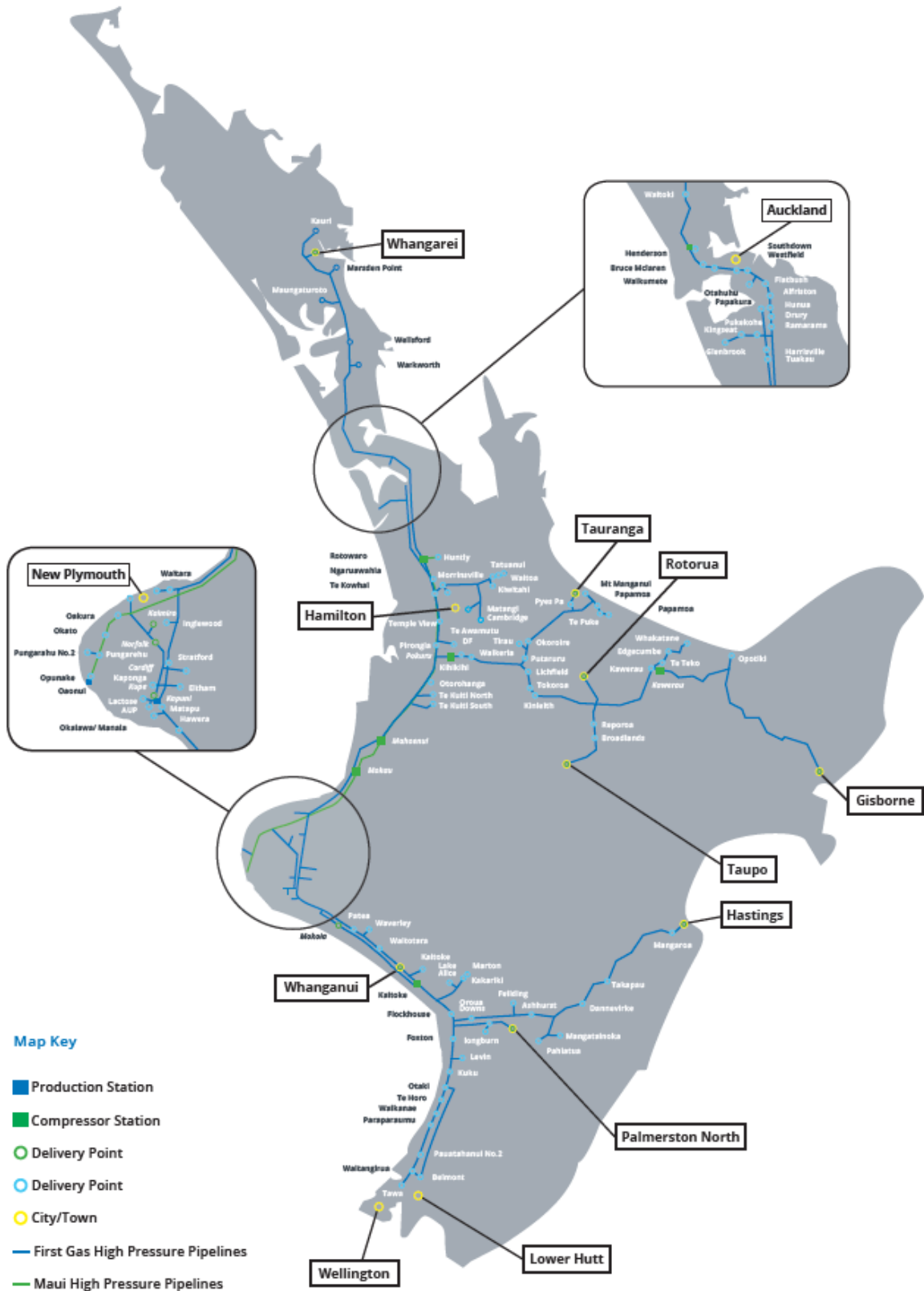
Figure 9   First Gas Transmission network

3.3.2 Overall Findings

Gap Analysis Summary

	Asset Knowledge	Strategic Planning Processes	Asset Management Practices	Information Systems	Organisational Tactics
☐ Best Appropriate	86%	82%	79%	85%	79%
■ Current	81%	64%	76%	80%	68%
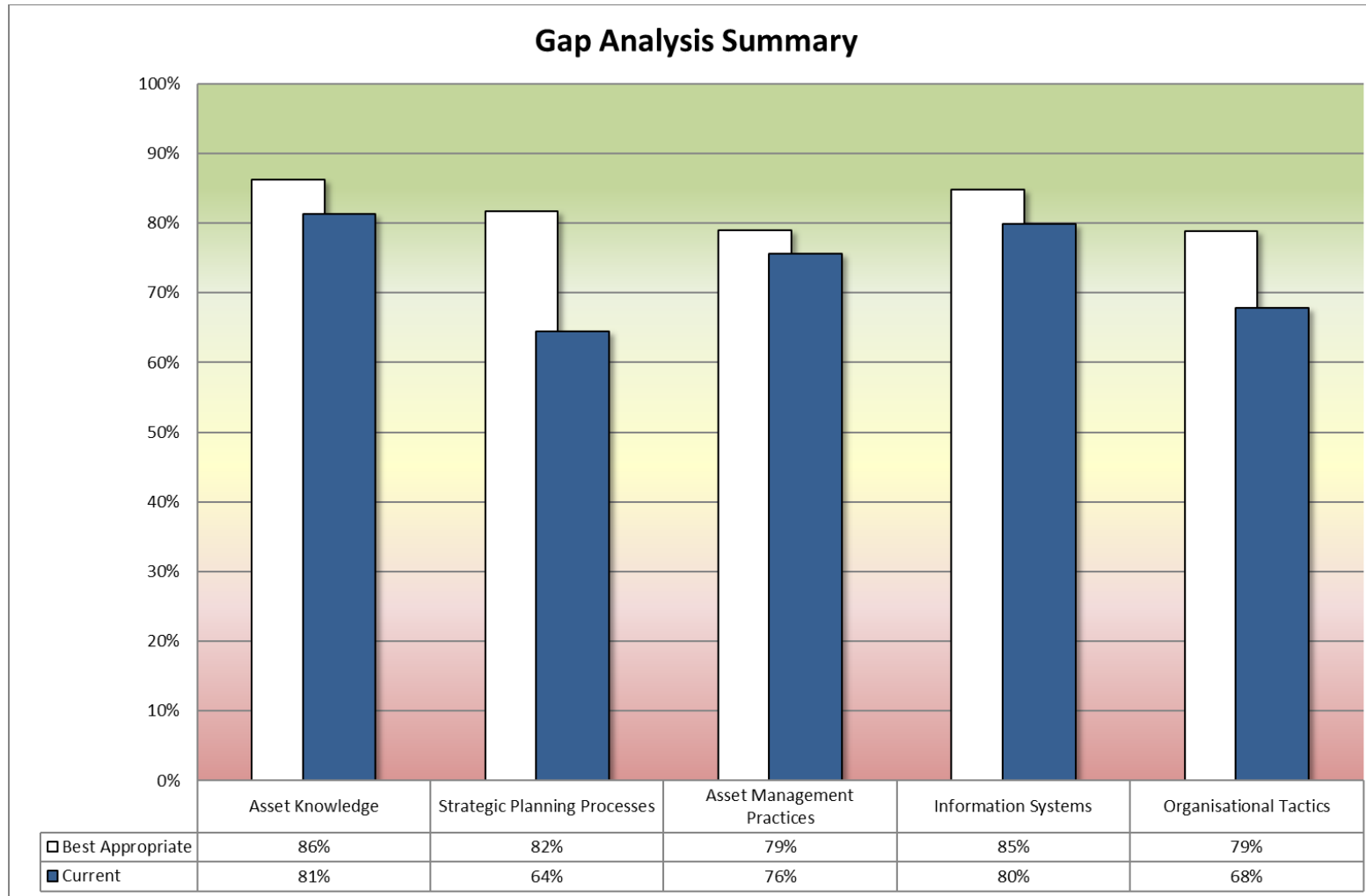
Figure 10   Gap analysis summary – First Gas Transmission

First Gas Transmission (FGL-TR) is approaching the level of risk management we believe to be best appropriate for such an organisation. We consider the current rating is commendable considering:

- the organisation is very new, and has needed to implement changes to systems and approaches established by the previous networks owner to reflect the size of FGL and the relevant networks; and

- there is clear evidence of ongoing improvement activities.

We were impressed by the demonstrated use of systems and risk principles to drive actions. We were also impressed with the clear evidence throughout the FGL offices that risk was a high priority with scheduled risk management workshops seen, incidental conversations regarding risk management overheard and risk management framework posters displayed in prominent places. We also observed that there was a strong culture of continuous improvement.

Many of the identified gaps will be addressed through current improvement activities. The key gaps reflect:

- A slightly narrow focus to the network risk management. This reflects the adoption of technical standards with somewhat prescriptive risk management approaches. Although consequence impact areas rated include aspects beyond health and safety, the events themselves tend to have been identified within an overall network integrity/public safety context. Given that this complies with accepted standards, we cannot say that it is inadequate as such. However, we believe an approach which is tied clearly to the broader asset management objectives would strengthen FGL-TR's risk management.

- Limited understanding of what security of supply risk external stakeholders consider acceptable.

- Although strategic mains and high consequence areas are identified, aspects considered when identifying critical assets are somewhat narrow, linkages to the established risk management frameworks are not clear and means to systematically apply this across the organisation to ensure consistency could be strengthened.

- Limited systematic optimisation of activities associated with risks and/or drawing on risk principles.

- Although there is a good understanding of infrastructure failure profiles and renewal needs in the first ten years, there is limited understanding of these aspects in the longer-term.

- Some systems are not integrated to exploit their ease of use and functionality.

Further details are presented in the following sections. Details of the assessment are presented in Appendix A.

3.3.3   Findings by Category

Asset Knowledge

Asset Knowledge

	Asset Categorisation	Location Data	Physical Attributes Data	O & M Data	Condition Data	Capacity Data	Performance Data	Asset Life Data	Risk Management Data	Financial Data
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10
☐ Best Appropriate	85%	91%	90%	87%	85%	85%	85%	85%	85%	85%
◼ Current Score	79%	81%	84%	75%	85%	85%	85%	77%	78%	85%
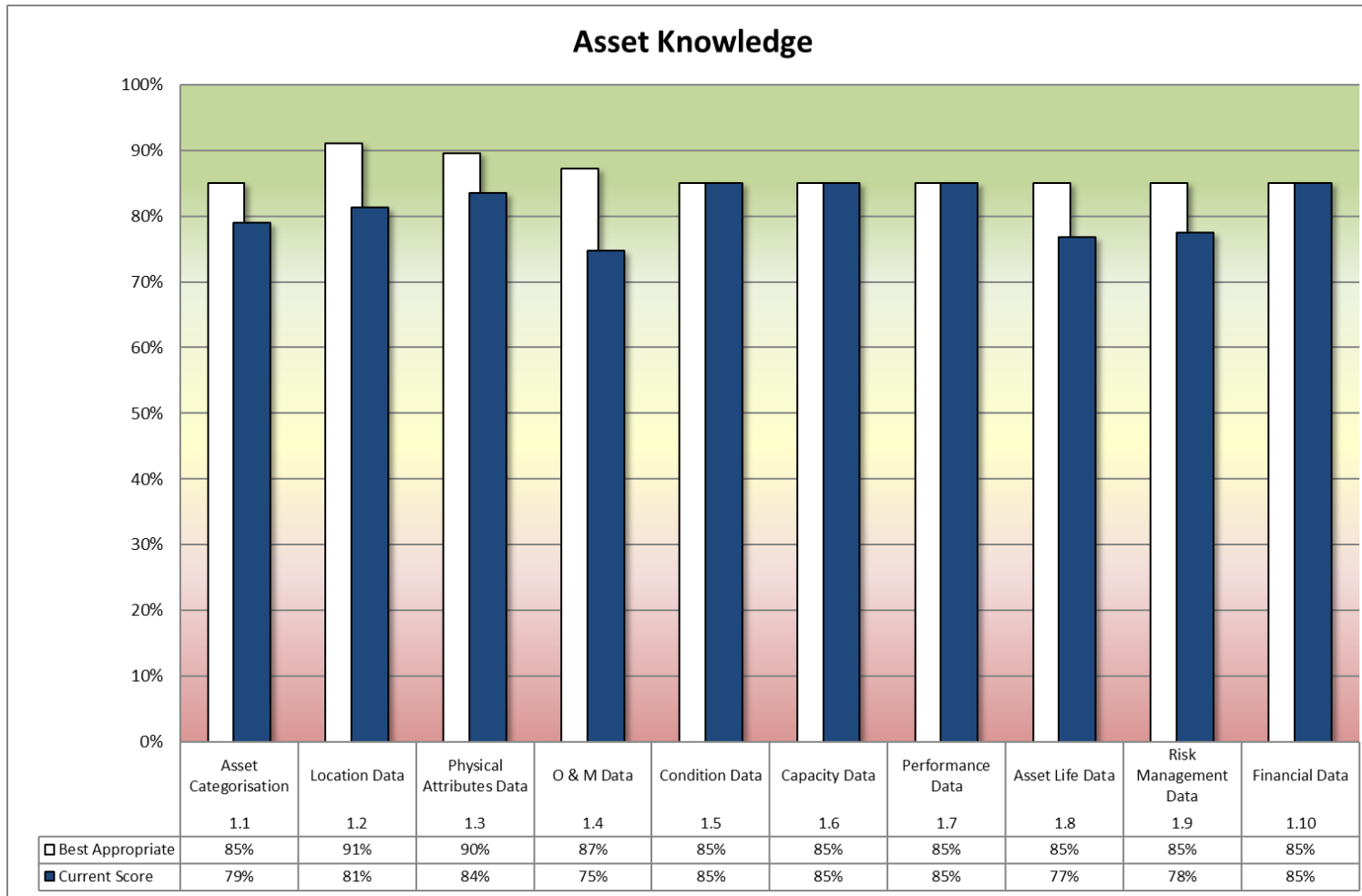
Figure 11   Asset knowledge – First Gas Transmission

FGL-TR has a good knowledge-base of condition, capacity and performance information, as well as financial data. We consider that this is at a level that is best appropriate for this organisation, although would like to specifically note the importance of continuous improvement beyond the short-term. This is evidenced as a progressive shift in stakeholder and industry expectations.

Minor gaps in the remaining elements reflect:

- Asset categorisation – lack of finalised documentation and some minor data gaps which are being progressively addressed.

- Location data – some data gaps with older assets which are being progressively addressed.

- Physical attributes – a review needs to be undertaken to determine/confirm what attributes are required.

- O&M data – Past inconsistencies and/or limited recording of types of failures within Maximo (maintenance management system).

- Asset life data – some gaps in install dates, and limited systematic recording and review of expected lives within the asset data.

- Risk management data – network risk data currently held within MS Excel spreadsheets although this is being converted into a Mipela database. Critical assets not systematically defined.

Strategic Planning Processes

	Demand Forecasting Processes 2.1	Strategic Failure Prediction 2.2	Tactical Failure Prediction 2.3	Renewals Planning 2.4	Risk Management Strategy 2.5	Risk Management Consultation 2.6	Risk Management Decision Making 2.7
☐ Best Appropriate	81%	84%	84%	85%	83%	73%	83%
■ Current Score	74%	72%	73%	75%	68%	28%	61%
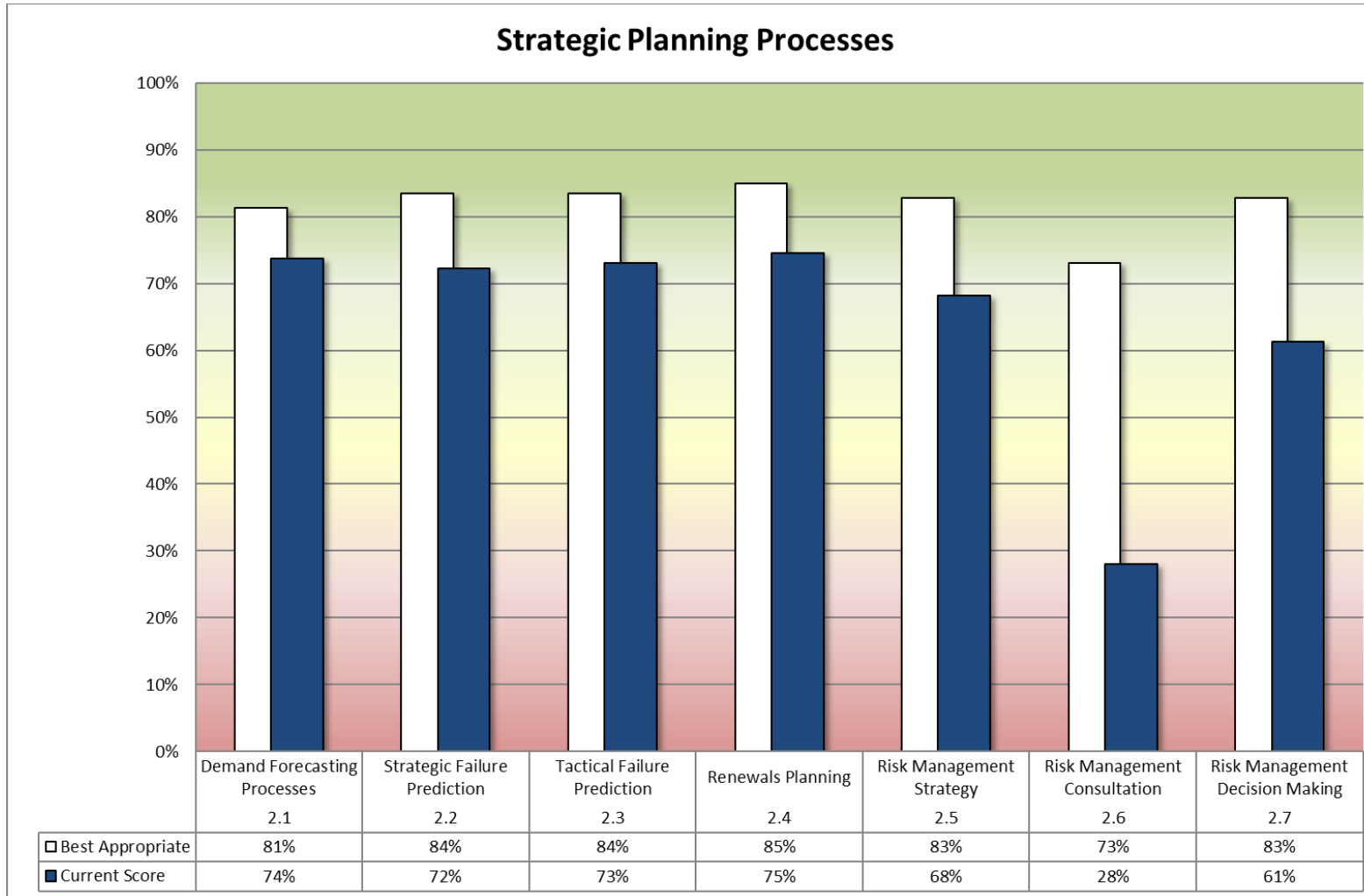
Figure 12   Strategic planning processes – First Gas Transmission

FGL-TR's strategic planning processes are at a level approaching what we consider to be a best appropriate level although note that risk management consultation is notably lower than other elements assessed. The completion of the identified improvement projects already underway will go some way to closing the following gaps:

- Demand forecasting – limited separate analysis of separate specific drivers of demand change and segmentation of usage patterns.

- Strategic failure prediction – criticality not systematically defined and applied, and limited analysis of mid to long-term failure profiles.

- Tactical failure prediction – longer-term degradation modelling not undertaken, and criticality and risk ratings not yet recorded in Maximo.

- Renewals planning – good analysis of 10-year renewals forecasts, but limited consideration of longer-term profiles.

- Risk management strategy – network risks are not strongly linked back to the broader asset management objectives and tend to have a focus on safety reflecting the focus of the applicable technical standards. Geohazards and their risk ratings are identified in the asset management plan, although reasons behind changed/refined ratings not articulated. No "risk management plan" document as such clearly documenting network risks requiring action, and what actions are proposed to address each of these risks. No systematic or formal articulation of business risk profile, or network risk/resilience profile. No formal assessment is undertaken to evaluate whether FGL-TR is "over-controlled" and optimisation of risk treatment options is currently a manual process. Review programmes are yet to be proven in such a young organisation.

- Risk management consultation – although stakeholders are identified, and work has been undertaken to understand what security of supply risk they consider acceptable, this is not quantified and does not include consideration of their "willingness-to-pay".

- Risk management decision-making – clear evidence that risk forms a key input into FGL-TR's decision-making. However, there is not yet a systematic framework or approach to ensure that decisions are made consistently across the organisation.

Asset Management Practices

AM Practices

	Design Processes 3.1	Asset Acceptance Processes 3.2	O & M Strategy and Analysis 3.3	O & M Plans 3.4	Maintenance Execution 3.5
☐ Best Appropriate	85%	70%	81%	80%	80%
■ Current Score	85%	70%	75%	77%	72%
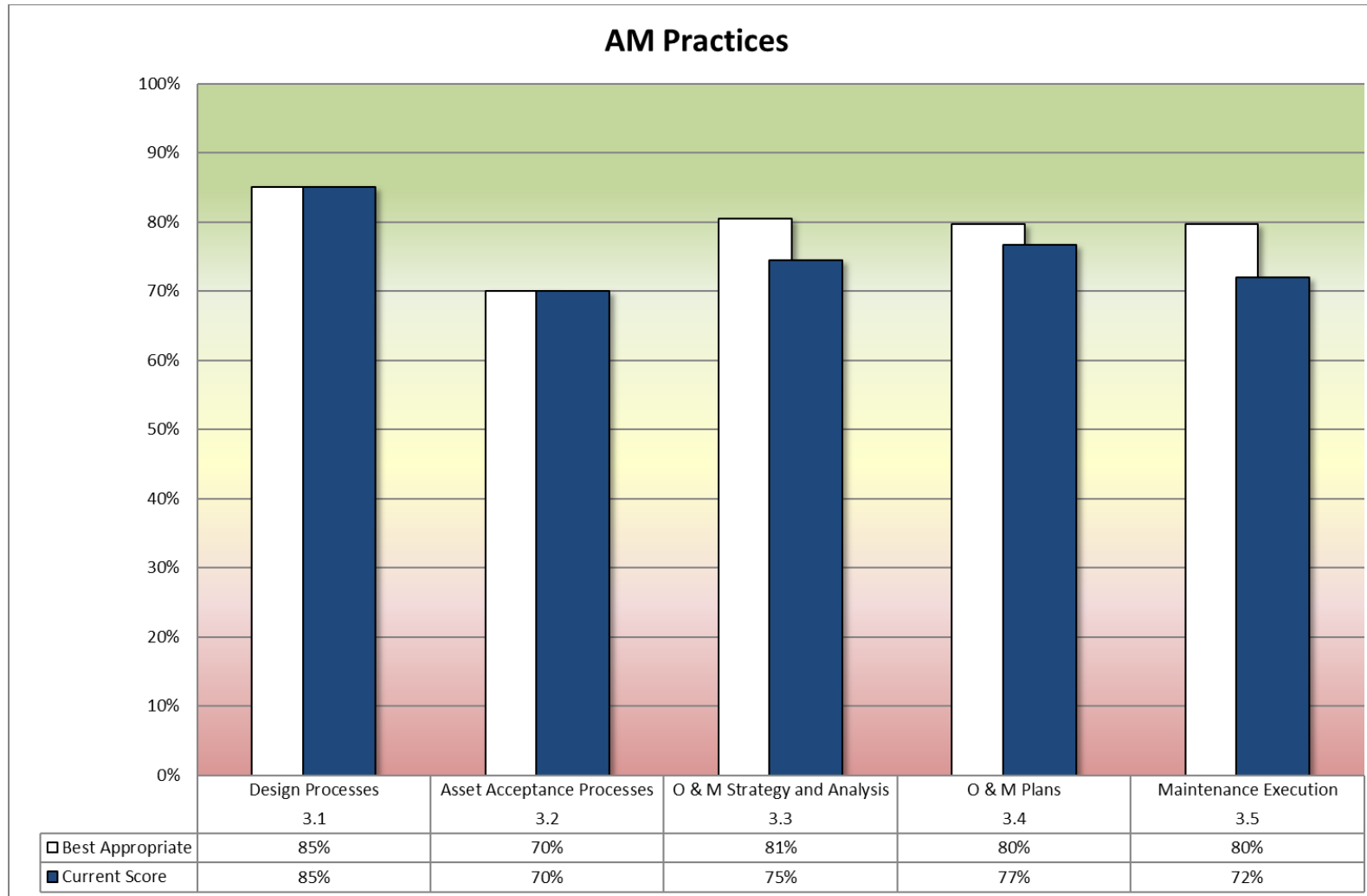
Figure 13   Asset management practices – First Gas Transmission

FGL-TR has strong design and asset acceptance procedures in place. These are at a level we consider best appropriate for this organisation.

Minor gaps in the remaining elements reflect:

- O&M strategy and analysis – systematic optimisation of reactive, preventative maintenance and renewals strategies could be strengthened.

- O&M plans - network risks are not strongly linked back to the broader asset management objectives and tend to have a focus on safety reflecting the focus of the applicable technical standards.

- Maintenance execution – Failure mode, effects and criticality analysis (FMECA) still developing, including the development of a systematic criticality assessment framework and a network-wide risk model. Network risks are not strongly linked back to the broader asset management objectives. No formal process to specifically address High Impact Low Probability events.

Information Systems

Information Systems

	Asset Register System	Geographic Information System	Customer Service System	Maintenance Management System	Condition Monitoring System	SCADA System	Capacity / Utilisation Models	Advanced RM Systems
	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8
☐ Best Appropriate	85%	85%	85%	88%	85%	85%	85%	81%
■ Current Score	82%	79%	85%	77%	85%	68%	85%	78%
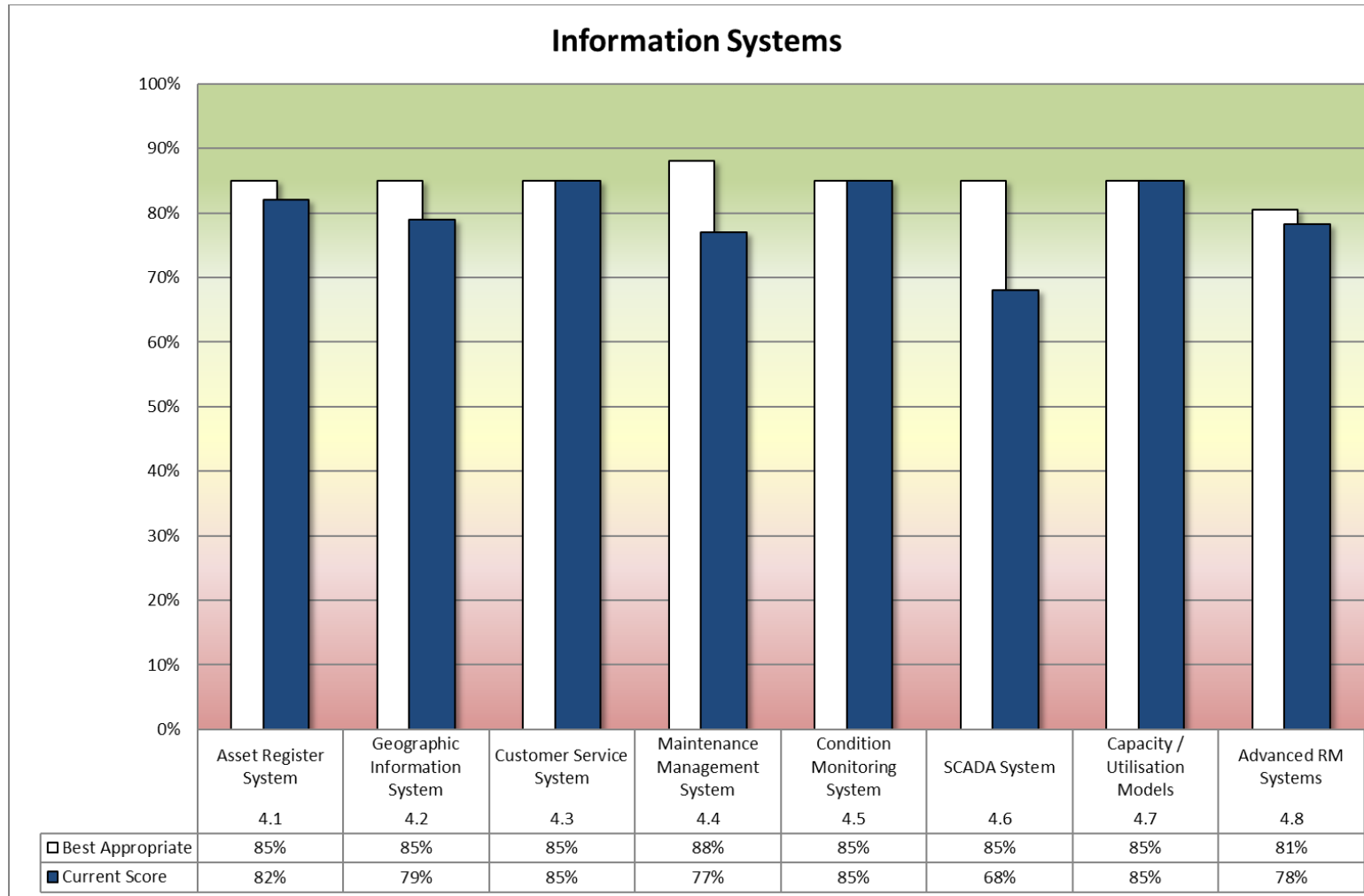
Figure 14   Information systems – First Gas Transmission

The systems configured and used by FGL-TR are largely best appropriate for the organisation. The systems used for customer service and condition monitoring (Maximo) and capacity/utilisation (Synergi) are industry-accepted systems.

Minor gaps in the remaining elements reflect:

- Asset register – ArcGIS is used as the main asset register. This is interfaced with the finance system (Dynamics NAV) but not currently with the maintenance management system (Maximo), leading to some workarounds being required and compromised asset data-change audit trails.

- Geographic information system (GIS) – ArcGIS is not yet interfaced with Maximo.

- Maintenance management system – ArcGIS is not yet interfaced with Maximo.

- SCADA – standalone system, it is not interfaced with any other systems.

- Advanced risk management (RM) system – Maximo can be used to effectively manage network risks, although work is still underway to bring the specific risk improvements noted earlier into the system. Maximo not currently interfaced with GIS.

Organisational Tactics

Organisational Tactics

	RM Improvement 5.1	Commercial Tactics 5.2	Corporate Sponsorship and Commitment 5.3	RM Responsibilities 5.4	RM Training & Skills 5.5	Legislative Compliance 5.6	Organisational Resilience 5.7
☐ Best Appropriate	75%	78%	85%	85%	75%	85%	70%
■ Current Score	63%	65%	78%	73%	67%	85%	45%

Figure 15   Organisational tactics – First Gas Transmission

FGL-TR has strong legislative compliance processes in place, which are at a level we consider to be best appropriate. We believe that FGL-TR is well on the way to establishing its practices at a level which demonstr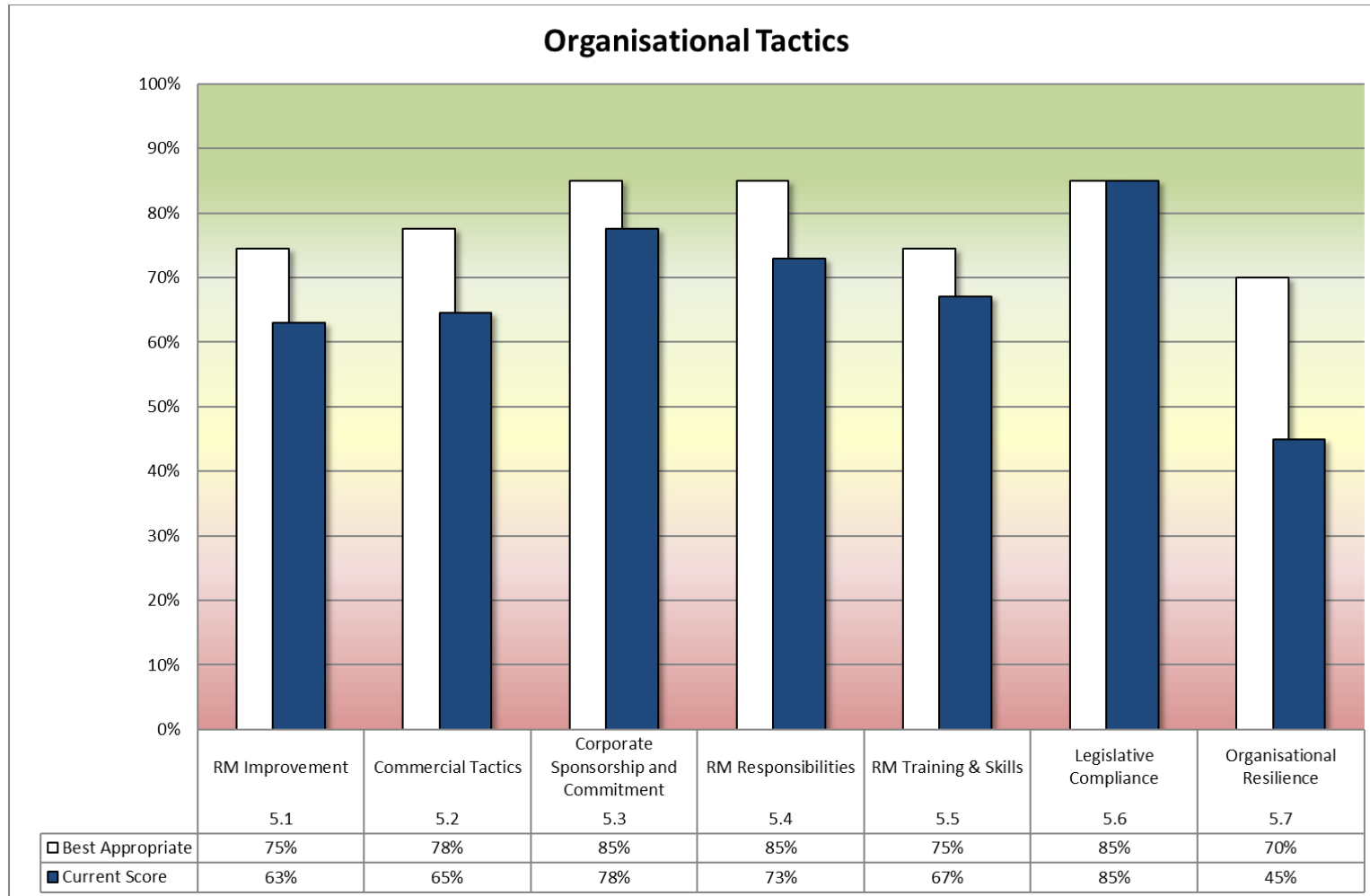ates sound corporate commitment to asset management and risk management, and many of the identified gaps should be reasonably straightforward to close.

Gaps in the remaining elements reflect:

- RM improvement – no programme of independent audit or formalised benchmarking in place. Self-assessment of asset management (AM) maturity is undertaken using the AMMAT tool which could be externally verified periodically. The assessment undertaken for this report can be used to compare organisations at a more detailed level.

- Commercial tactics – processes to ensure that risks associated with outsourced activities are managed in accordance with FGL-TR risk processes could be strengthened. No quality system in place.

- Corporate sponsorship and commitment – strong evidence to indicate good support for strengthening risk management. No formal risk management plan document in place.

- RM responsibilities – a systematic competency framework and roles/responsibilities documented into the risk management policy would strengthen this element.

- RM training and skills - a systematic competency framework would strengthen this element.

- Organisational resilience – although some work has been undertaken on understanding organisational resilience and preparedness, this is more of a risk-type approach. Use of a self-assessment tool, such as OrgRes, would enable a better understanding of the organisational resilience.

3.4   First Gas Distribution

3.4.1   Context

Refer to Section 3.3.1 for general information on First Gas Ltd.

The First Gas distribution business incorporates gas distribution networks across the Northland, Waikato, the Central Plateau, Bay of Plenty, Gisborne and Kapiti regions of the North Island, as highlighted in the figure below. It provides gas distribution services to retailers who sell gas to approximately 63,000 residential, commercial and industrial customers.

GENERAL NOTES:
1. Cadastral information sourced from CoreLogic.
2. Topographical information sourced from LINZ Data Service under the Creative Commons Attribution 3.0 New Zealand licence.

Figure 16   First Gas Distribution networks

3.4.2   Overall Findings

Gap Analysis Summary

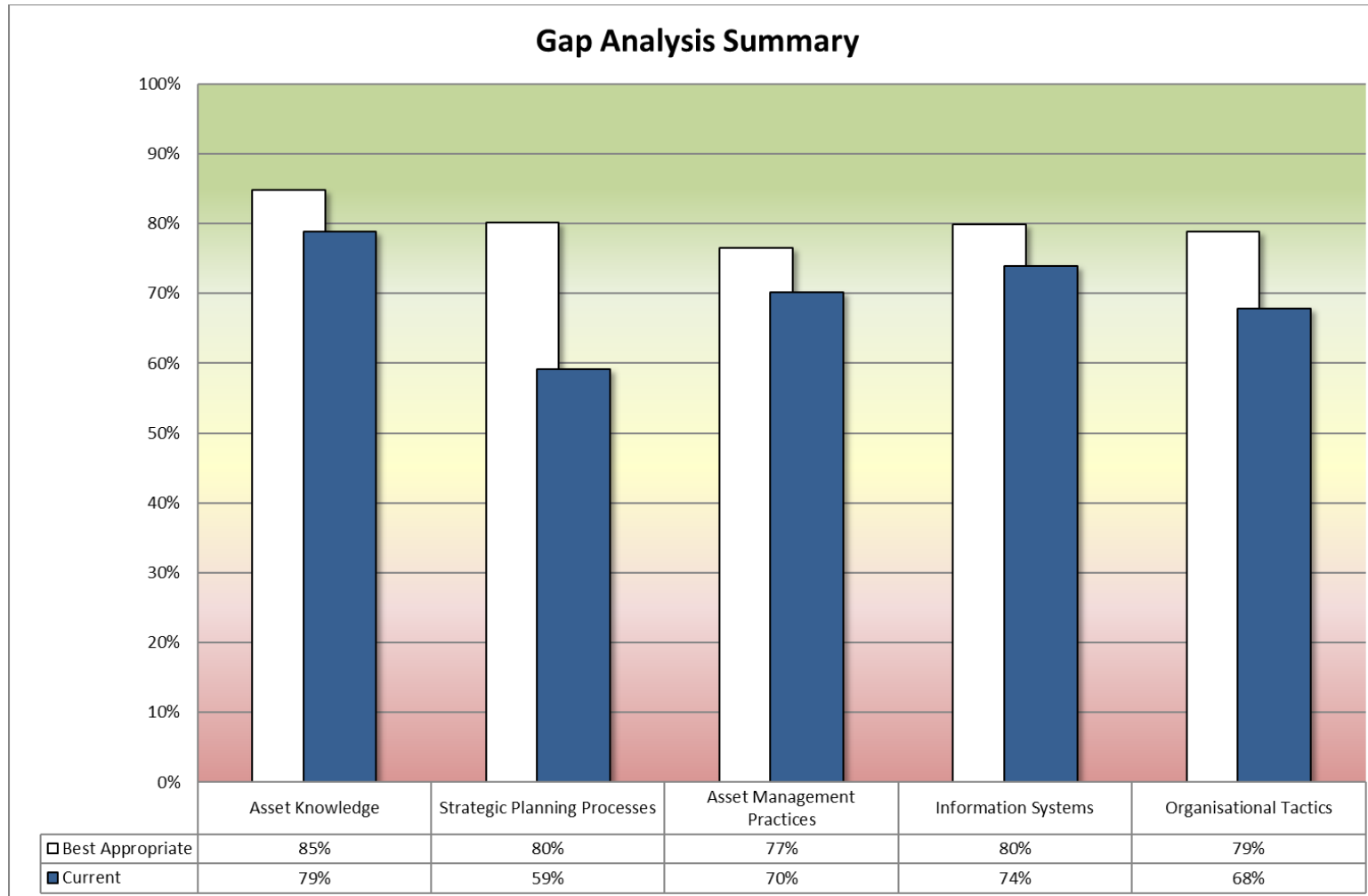|	Asset Knowledge	Strategic Planning Processes	Asset Management Practices	Information Systems	Organisational Tactics
☐ Best Appropriate	85%	80%	77%	80%	79%
■ Current	79%	59%	70%	74%	68%

Figure 17   Gap analysis summary – First Gas Distribution

First Gas Distribution (FGL-DTR) is approaching the level of risk management we believe to be best appropriate for such an organisation. We consider the current rating is commendable considering:

- The organisation is very new, and has needed to implement changes to systems and approaches established by the previous networks owner to reflect the size of FGL and the relevant networks.

- There is clear evidence of ongoing improvement activities.

We were impressed with the clear evidence throughout the FGL offices that risk was a high priority, and that there was a good culture of continuous improvement[11].

Many of the identified gaps will be addressed through current improvement activities. The key gaps reflect:

- A slightly narrow focus to the network risk management. This reflects the adoption of technical standards with somewhat prescriptive risk management approaches. Although consequence impact areas rated include aspects beyond health and safety, the events themselves tend to have been identified within an overall network integrity/public safety context. Given that this complies with accepted standards, we cannot say that it is inadequate as such. However, we believe an approach which is tied clearly to the broader asset management objectives would strengthen FGL-DTR's risk management;

- Limited understanding of what security of supply risk external stakeholders consider acceptable.

- Strategic mains (large, high pressure) and high consequence areas defined. These assets are managed more closely than other assets. No rigorous asset-specific criticality analysis linked to risk frameworks undertaken.

- Limited systematic optimisation of activities associated with risks and/or drawing on risk principles.

- Although there is a good understanding of industry-wide issues and a reasonable understanding of infrastructure failure profiles and renewal needs on a cohort basis in the first ten years, there is limited understanding of these aspects in the longer-term.

- Some systems are not integrated to exploit their ease of use and functionality.

Further details are presented in the following sections. Details of the assessment are presented in Appendix B.

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[11] Refer also 3.3.2

3.4.3   Findings by Category

Asset Knowledge

Asset Knowledge

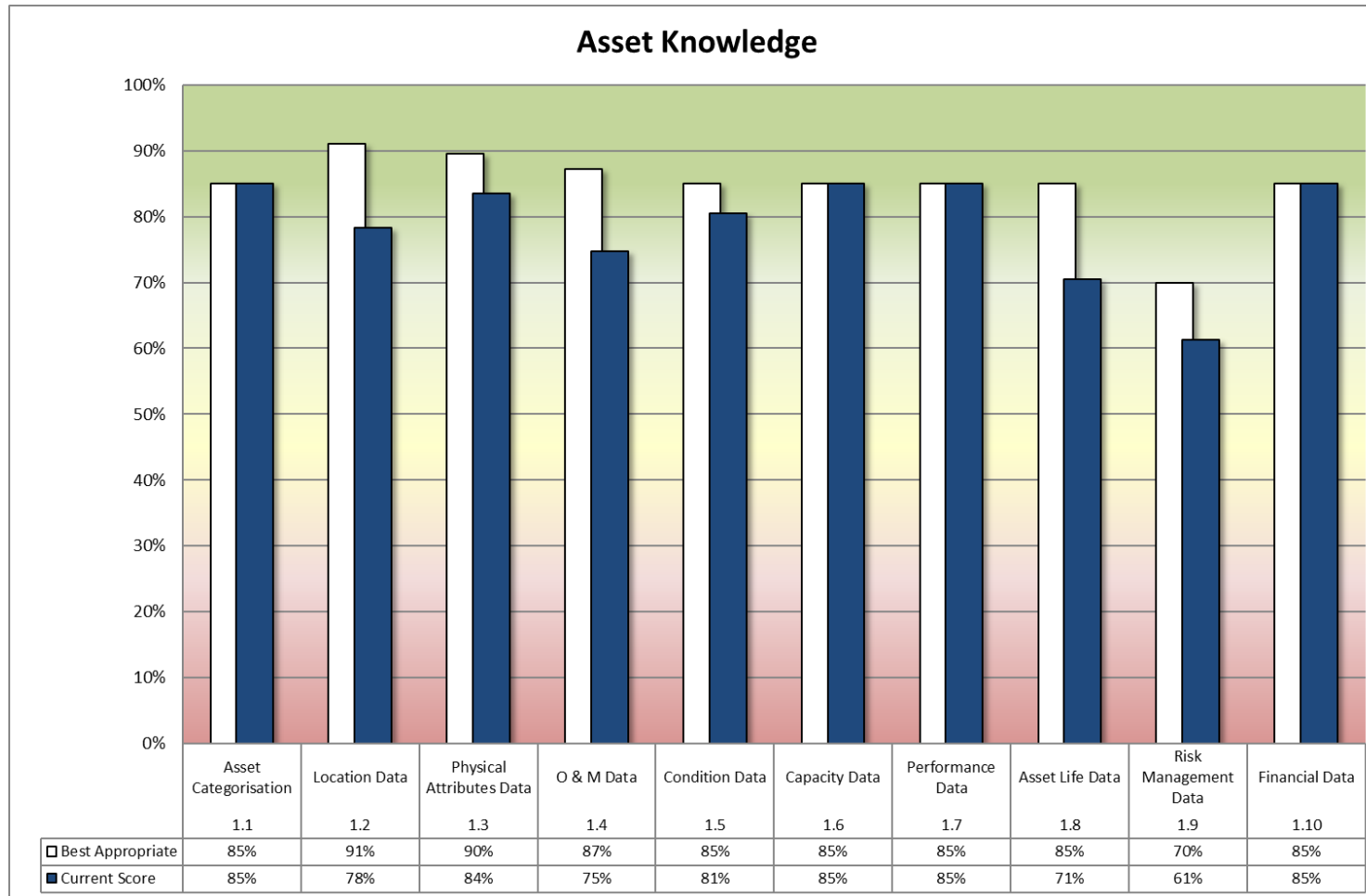|	Asset Categorisation	Location Data	Physical Attributes Data	O & M Data	Condition Data	Capacity Data	Performance Data	Asset Life Data	Risk Management Data	Financial Data
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10
☐ Best Appropriate	85%	91%	90%	87%	85%	85%	85%	85%	70%	85%
■ Current Score	85%	78%	84%	75%	81%	85%	85%	71%	61%	85%

Figure 18   Asset knowledge – First Gas Distribution

FGL-DTR has sound asset categorisation in place and a good knowledge-base of capacity, performance and financial data. We consider that this is at a level that is best appropriate for this organisation, although would like to specifically note the importance of continuous improvement. This is evidenced as a progressive shift in stakeholder and industry expectations.

Minor gaps in the remaining elements reflect:

- Location data – some data gaps, although this is not able to be accurately quantified.

- Physical attributes - some missing attribute data source records and some data gaps which are being progressively addressed.

- O&M data – Past inconsistencies and/or limited recording of types of failures within Maximo.

- Condition data – Opportunity to strengthen formalised processes to optimally capture, update and report on asset condition data.

- Asset life data – some gaps in install dates, and no systematic recording and review of expected lives within the asset data.

- Risk management data – network risk data by asset class currently held within MS Excel spreadsheets although work is underway to transfer this to Maximo. Critical assets not systematically defined.

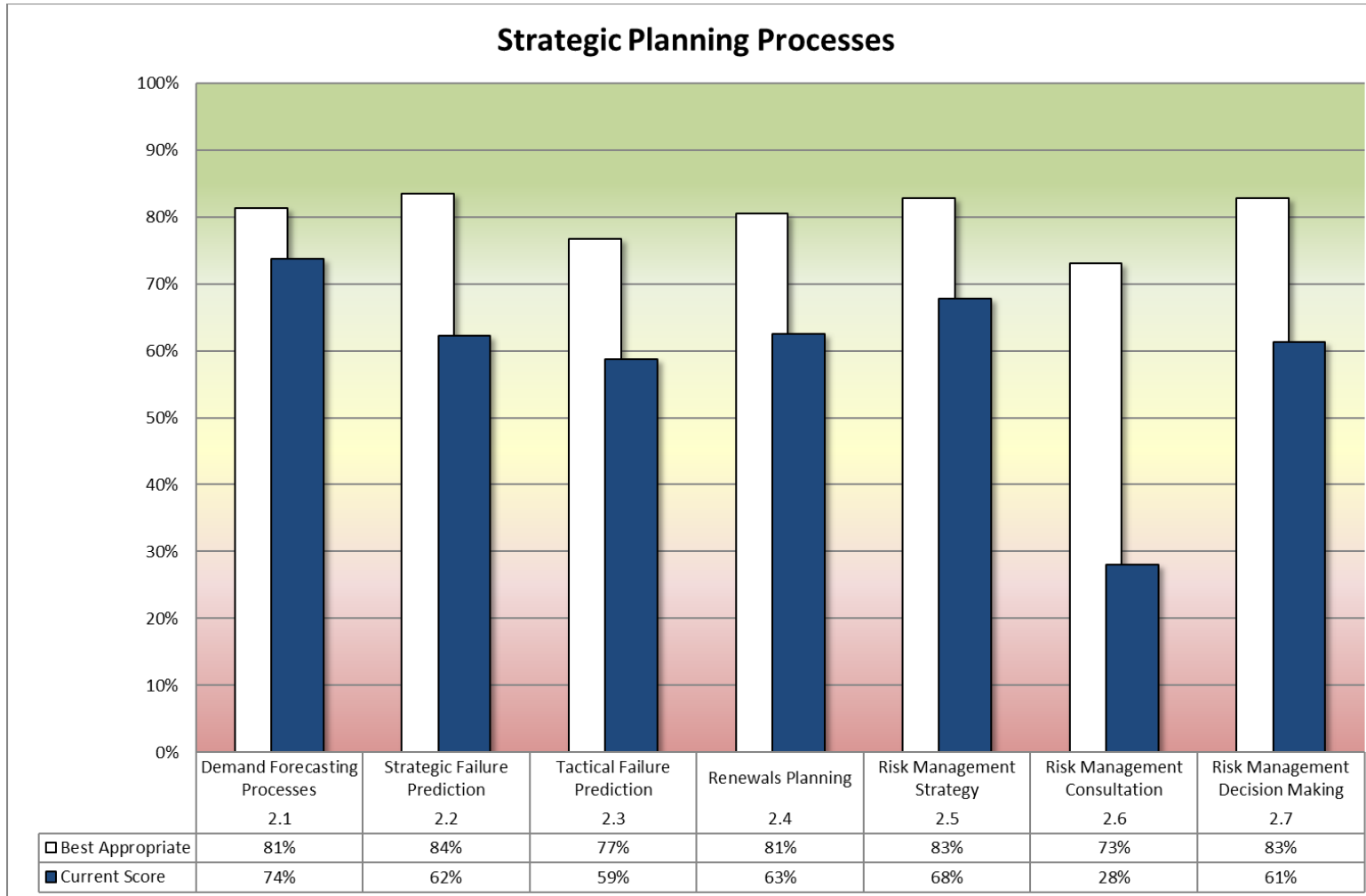## Strategic Planning Processes

Figure 19   Strategic planning processes – First Gas Distribution

FGL-DTR's strategic planning processes are progressing towards a level that we consider to be best appropriate although note that risk management consultation is notably lower than other elements assessed. The completion of the identified improvement projects already underway will go some way to closing the following gaps:

- Demand forecasting – limited separate analysis of separate specific drivers of demand change and segmentation of usage patterns.

- Strategic failure prediction – criticality not systematically defined and applied, and limited analysis of network-wide degradation.

- Tactical failure prediction – FMEA limited to industry-wide issues currently, longer-term degradation modelling not undertaken, and criticality and risk ratings not yet recorded in Maximo.

- Renewals planning –analysis of 10-year renewals forecasts based on asset cohort issues, limited consideration of longer-term profiles;

- Risk management strategy – network risks are not strongly linked back to the broader asset management objectives and tend to have a focus on safety at an asset-class level reflecting the focus of the applicable technical standards. Types of risk are discussed in general terms in the asset management plan, although there is no "risk management plan" as such clearly documenting network risks requiring action, and what actions are proposed to address each of these risks. The Safety and Operating Plan is driven by risk but the linkages are not always clear. No systematic or formal articulation of business risk profile, or network risk/resilience profile. No formal assessment is undertaken to evaluate whether FGL-DTR is "over-controlled" and there is limited optimisation of risk treatment options using a manual process. Review programmes are yet to be proven in such a young organisation.

- Risk management consultation – Although stakeholders are identified, and work has been undertaken to understand what security of supply risk they consider acceptable, this is not quantified and does not include consideration of their "willingness-to-pay".

- Risk management decision-making – use of risk to drive decision-making is not as pronounced as within the transmission business. There is not yet a systematic framework or approach to ensure that optimum options are implemented and that decisions are made consistently across the organisation.

Asset Management Practices
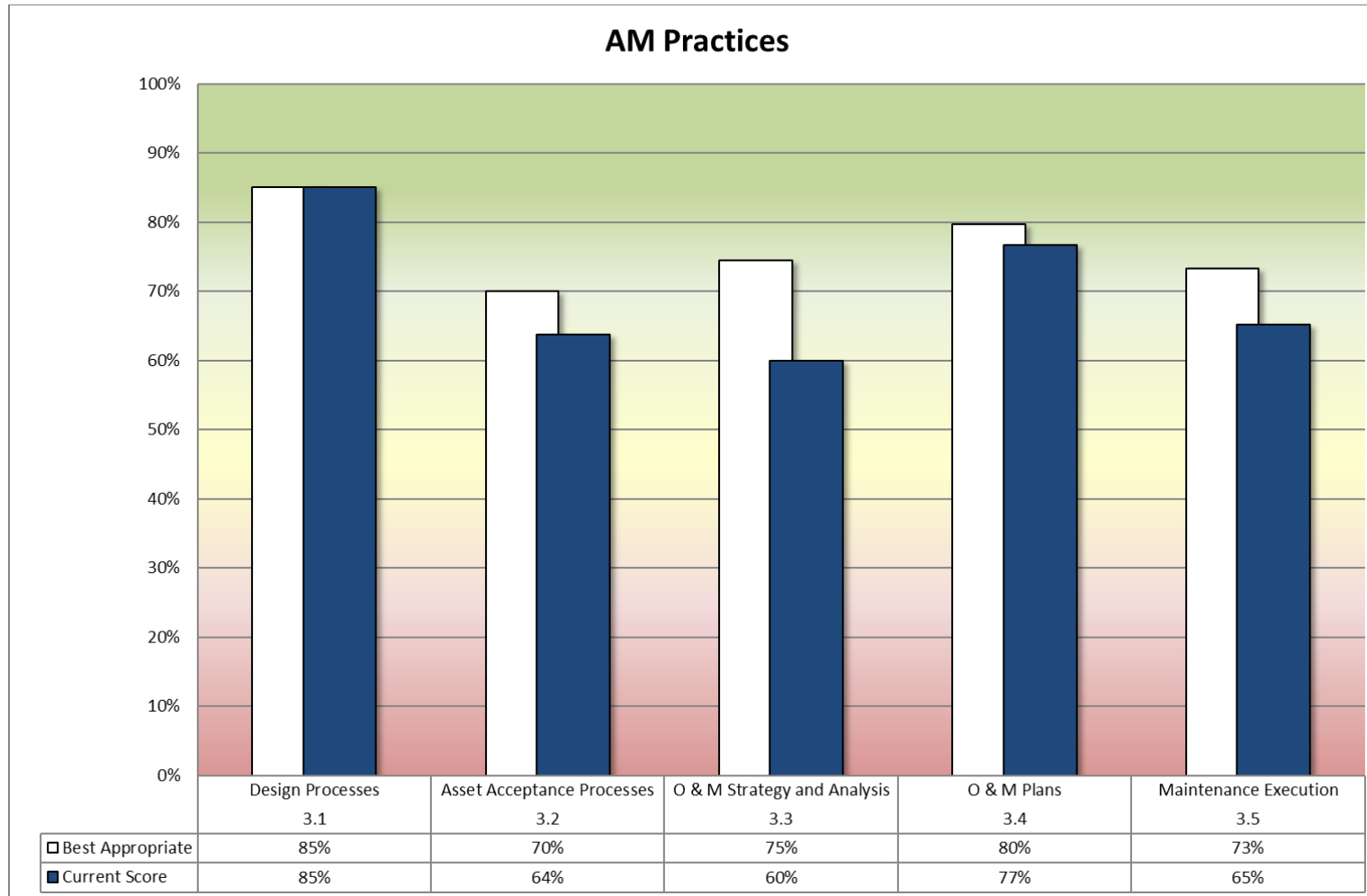
Figure 20   Asset management practices – First Gas Distribution

FGL-DTR has strong design procedures in place. These are at a level we consider best appropriate for this organisation.

Minor gaps in the remaining elements reflect:

- Asset acceptance processes – review/audit of 3rd-party provided data limited to a sample only.

- O&M strategy and analysis – systematic optimisation of reactive, preventative maintenance and renewals strategies could be strengthened.

- O&M plans - network risks are not strongly linked back to the broader asset management objectives and tend to have a focus on safety reflecting the focus of the applicable technical standards.

- Maintenance execution – FMEA limited at present to industry-wide issues. Network risks are not strongly linked back to the broader asset management objectives. No formal process to specifically address High Impact Low Probability events.

Information Systems
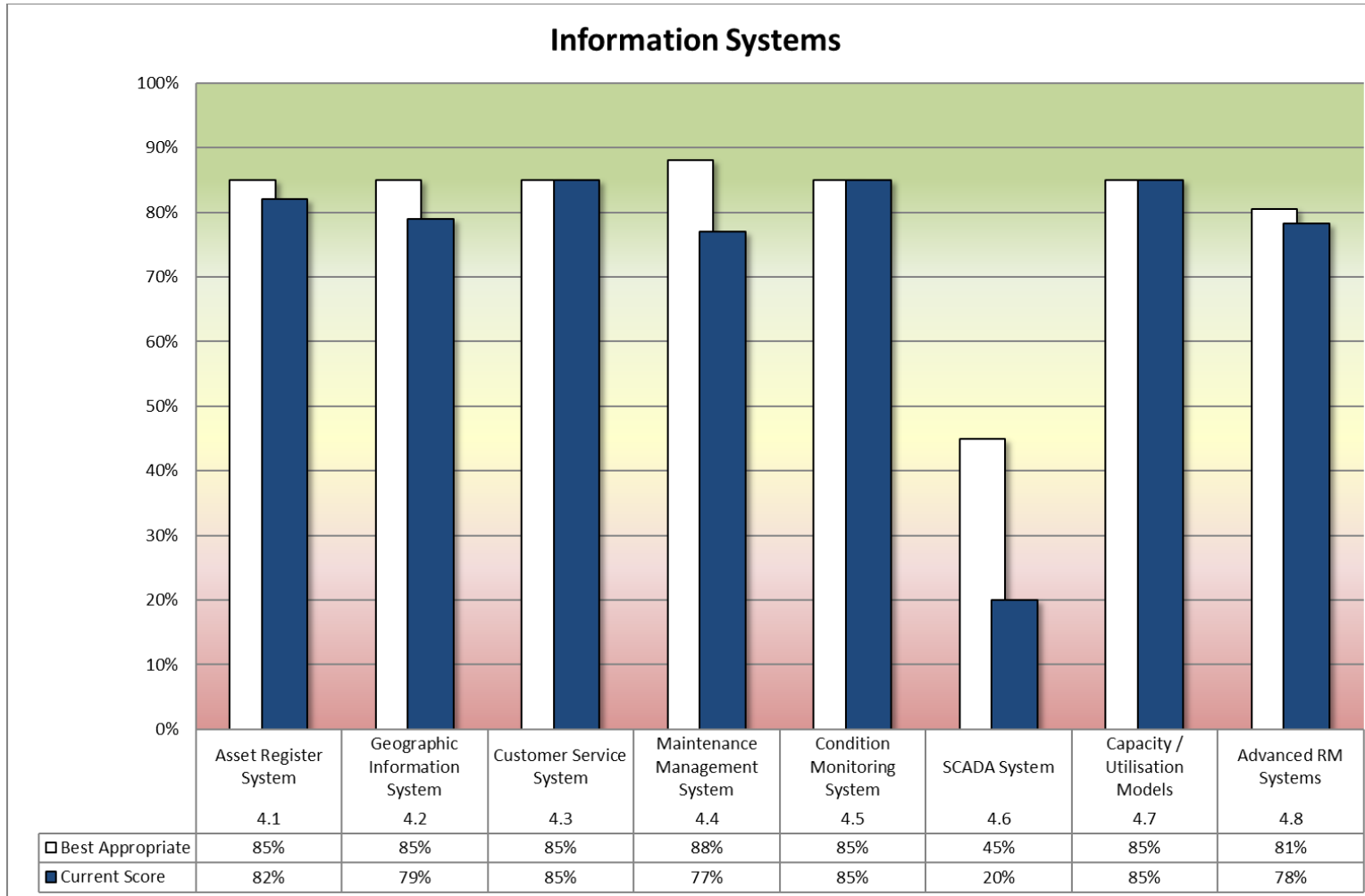
Figure 21　Information systems – First Gas Distribution

The systems configured and used by FGL-DTR are largely best appropriate for the organisation. The systems used for customer service and condition monitoring (Maximo) and capacity/utilisation (Synergi) are industry-accepted systems.

Minor gaps in the remaining elements reflect:

- Asset register – ArcGIS is used as the main asset register. This is interfaced with the finance system (Dynamics NAV) but not currently with the maintenance management system (Maximo), leading to some workarounds being required and compromised asset data-change audit trails.

- GIS – ArcGIS is not yet interfaced with Maximo.

- Maintenance management system – ArcGIS is not yet interfaced with Maximo.

- SCADA – not used on the distribution system.

- Advanced RM system – Maximo can be used to effectively manage network risks, although work is still underway to bring the specific risk improvements noted earlier into the system. Maximo not currently interfaced with GIS.

Organisational Tactics

Organisational Tactics

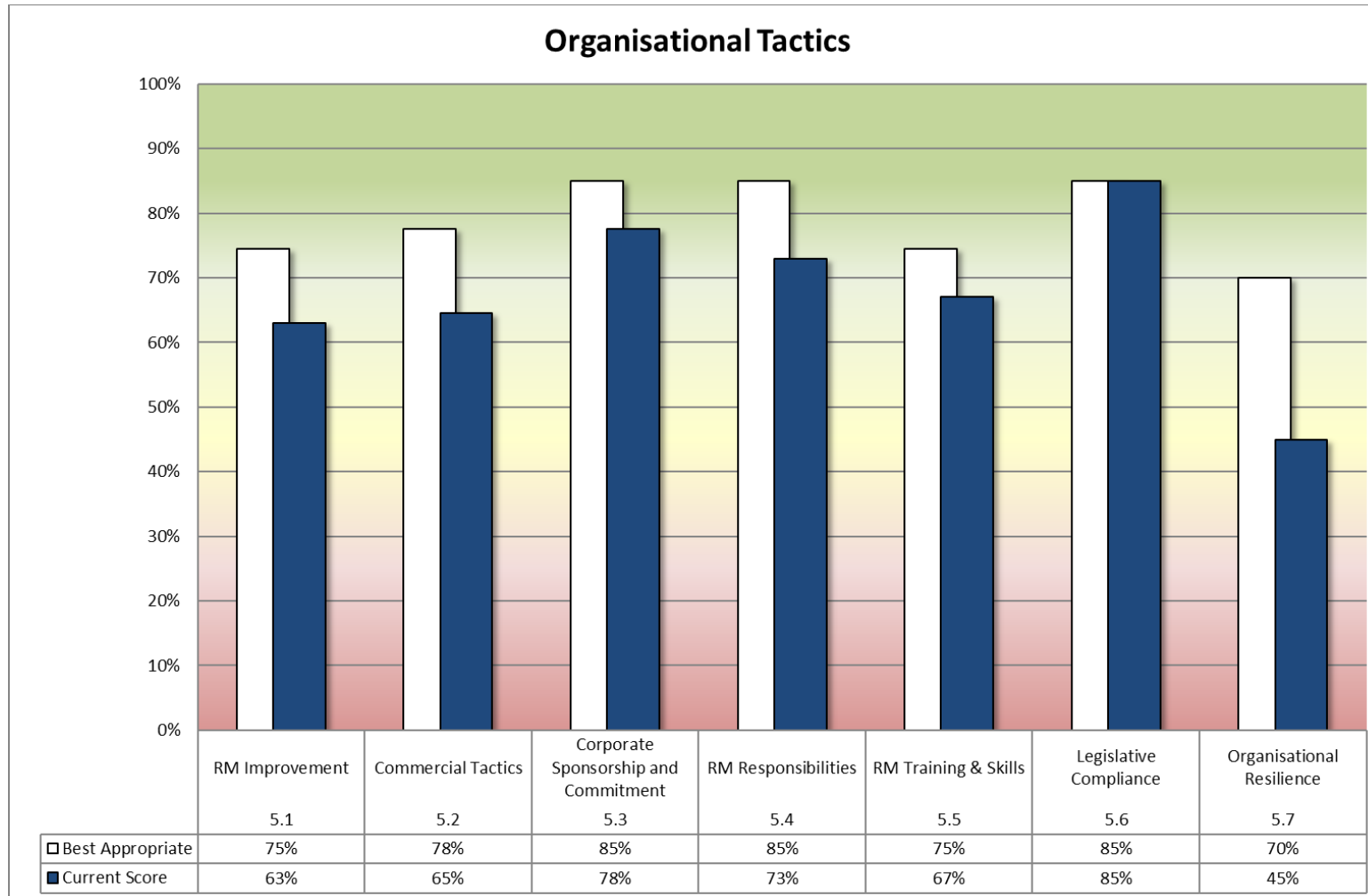|	RM Improvement	Commercial Tactics	Corporate Sponsorship and Commitment	RM Responsibilities	RM Training & Skills	Legislative Compliance	Organisational Resilience
	5.1	5.2	5.3	5.4	5.5	5.6	5.7
☐ Best Appropriate	75%	78%	85%	85%	75%	85%	70%
■ Current Score	63%	65%	78%	73%	67%	85%	45%

Figure 22   Organisational tactics – First Gas Distribution

FGL-DTR has strong legislative compliance processes in place, which are at a level we consider to be best appropriate. We believe that FGL-DTR is well on the way to establishing its practices at a level which demonstrates sound corporate commitment to asset management and risk management, and many of the identified gaps should be reasonably straightforward to close.

Gaps in the remaining elements reflect:

- RM improvement – no programme of independent audit or formalised benchmarking in place. Self-assessment of AM maturity is undertaken using the AMMAT tool which could be externally verified periodically. The assessment undertaken for this report can be used to compare organisations at a more detailed level.

- Commercial tactics – processes to ensure that risks associated with outsourced activities are managed in accordance with FGL-DTR risk processes could be strengthened. No quality system in place.

- Corporate sponsorship and commitment – strong evidence to indicate good support for strengthening risk management. No formal risk management plan document in place.

- RM responsibilities – a systematic competency framework and roles/responsibilities documented into the risk management policy would strengthen this element.

- RM training and skills - a systematic competency framework would strengthen this element.

- Organisational resilience – although some work has been undertaken on understanding organisational resilience and preparedness, this is more of a risk-type approach. Use of a self-assessment tool, such as OrgRes, would enable a better understanding of the organisational resilience.

3.5　　Vector

3.5.1　　Context

Vector owns and operates the gas distribution network in Auckland, New Zealand. It is the largest distributer of gas, supplying gas to over 106,000 installed connection points across the Auckland region from north of Wellsford to Tuakau in the south. The Vector network has 6,535 Kilometre (km) of underground pipes and supplied its customers with 14.3 Petajoules (PJ) of natural gas energy in Regulatory year 17 (year ending 31st March) (RY17).

Figure 23　Vector networks

3.5.2   Overall Findings

Gap Analysis Summary

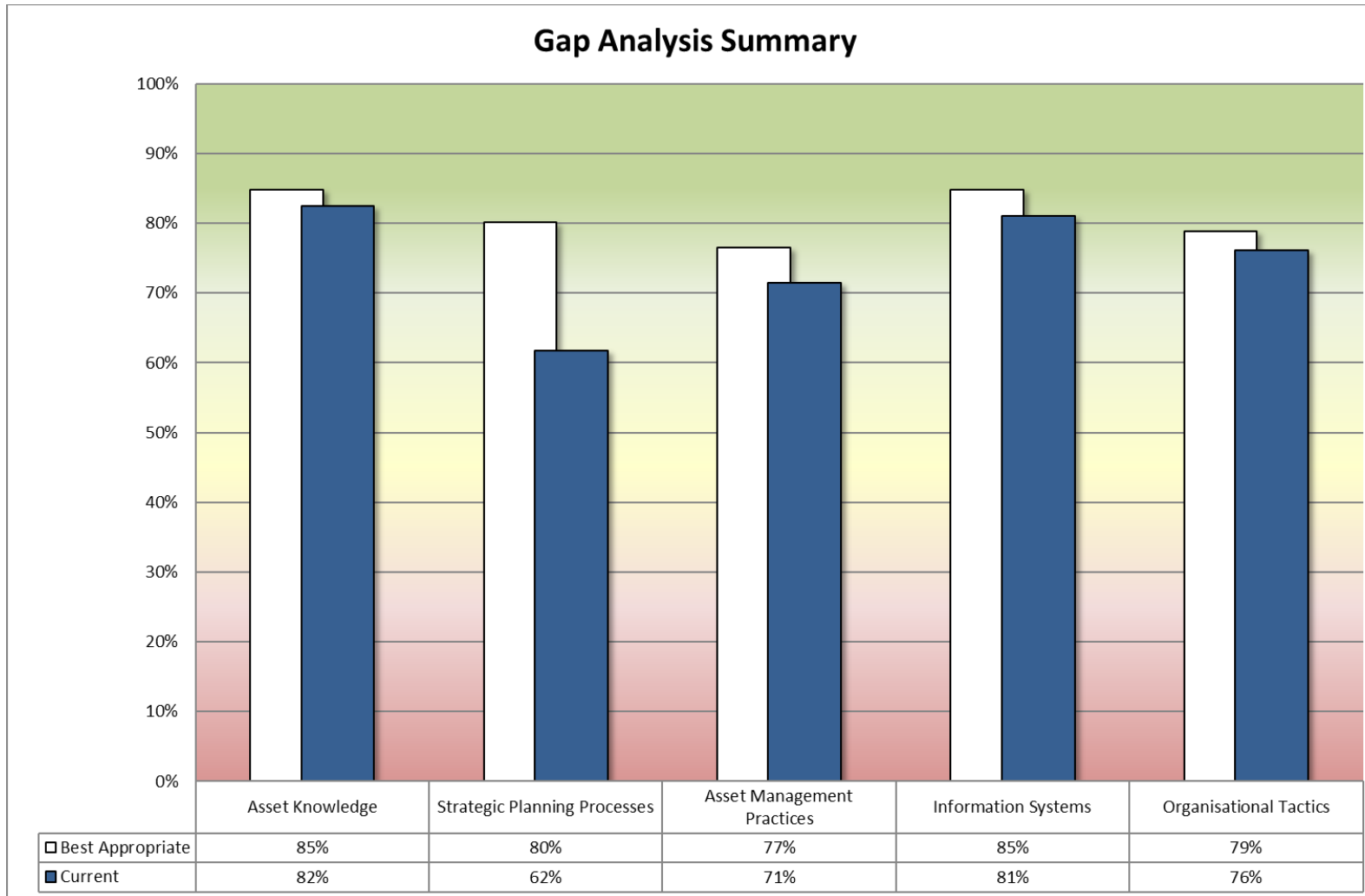|	Asset Knowledge	Strategic Planning Processes	Asset Management Practices	Information Systems	Organisational Tactics
☐ Best Appropriate	85%	80%	77%	85%	79%
■ Current	82%	62%	71%	81%	76%

Figure 24   Gap analysis summary – Vector

Vector is approaching the level of risk management we believe to be best appropriate for such an organisation with clear evidence that risk management is widely recognised as a core aspect of Vector's business. Vector's organisational structure, risk-specific role provision and broad consideration of risk (including organisational resilience) was identified as an aspect of particular strength.

Many of the identified gaps will be addressed through current improvement activities. The key gaps reflect:

- Limited understanding of what security of supply risk external stakeholders consider acceptable;

- Critical assets are defined although there is no formalised, systematic framework yet in place which links to the risk management framework to enable repeatable and consistent application across the network and across asset groups.

- Limited systematic optimisation of activities associated with risks and/or drawing on risk principles.

- Although there is a reasonable understanding of infrastructure failure profiles and renewal needs on a cohort basis in the first ten years, there is limited understanding of these aspects in the longer-term.

- Some systems are not integrated to exploit their ease of use and functionality.

Further details are presented in the following sections. Details of the assessment are presented in Appendix C.

3.5.3   Findings by Category
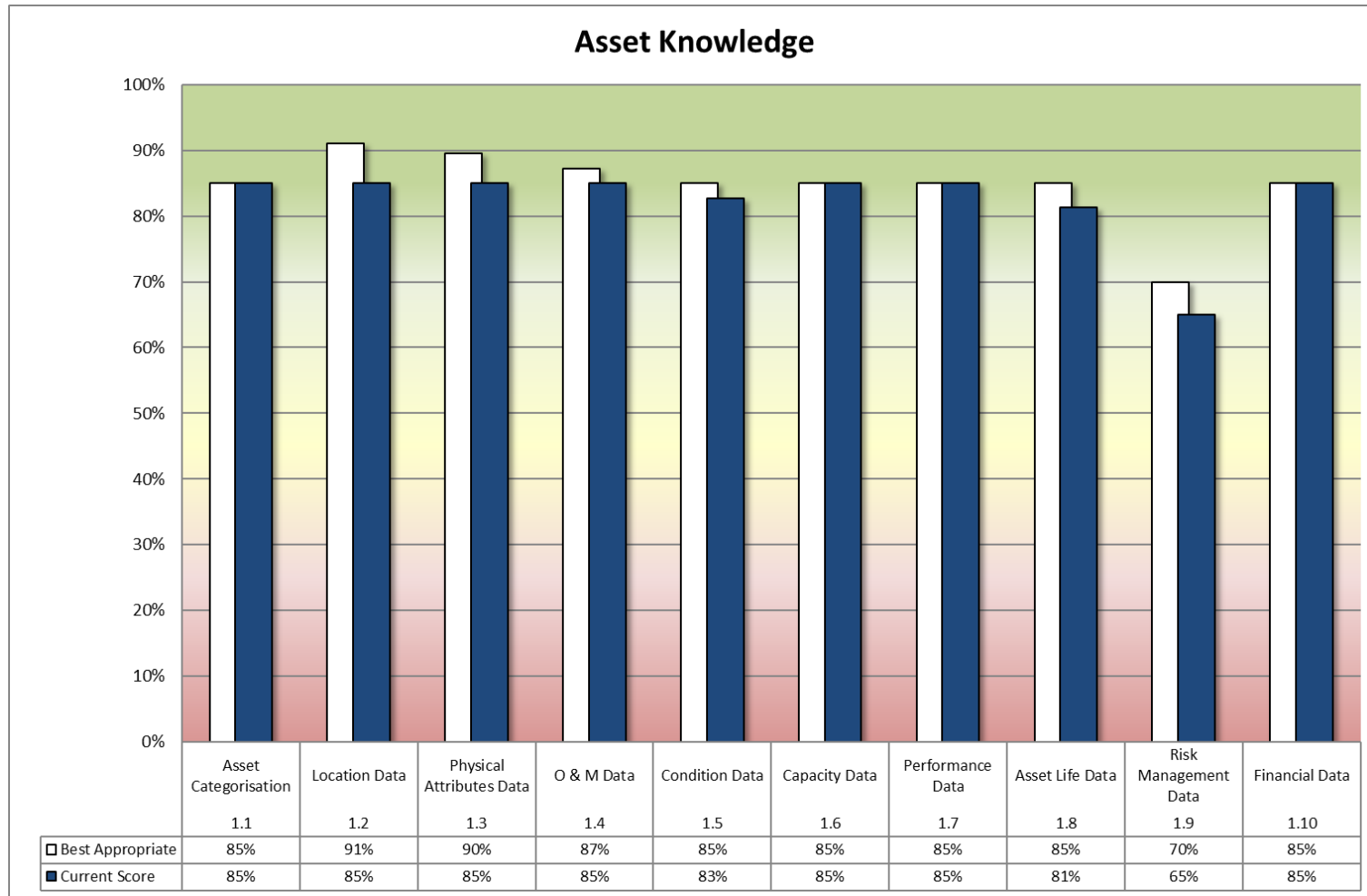
Asset Knowledge

Figure 25   Asset knowledge – Vector

Vector has sound asset categorisation in place and a good knowledge-base of capacity, performance and financial data. We consider that this is at a level that is best appropriate for this organisation, although would like to specifically note the importance of continuous improvement beyond the short-term. This is evidenced as a progressive shift in stakeholder and industry expectations.

Gaps in the remaining elements are generally minor, are subject to ongoing improvement activities and reflect the following:

- Location data – some very minor data gaps.

- Physical attributes – some very minor data gaps.

- O&M data – some minor data gaps, reactive maintenance data is generally not held against an asset and change management process documentation could possibly be strengthened.

- Condition data – some very minor data gaps.

- Asset life data – remaining asset lives largely based on age and no systematic review of expected lives within the asset data. Introduction of the planned Condition Based Asset Risk Model (CBARM) should address this.

- Risk management data – critical assets not systematically defined, although introduction of the planned Condition Based Asset Risk Model (CBARM) should address this.
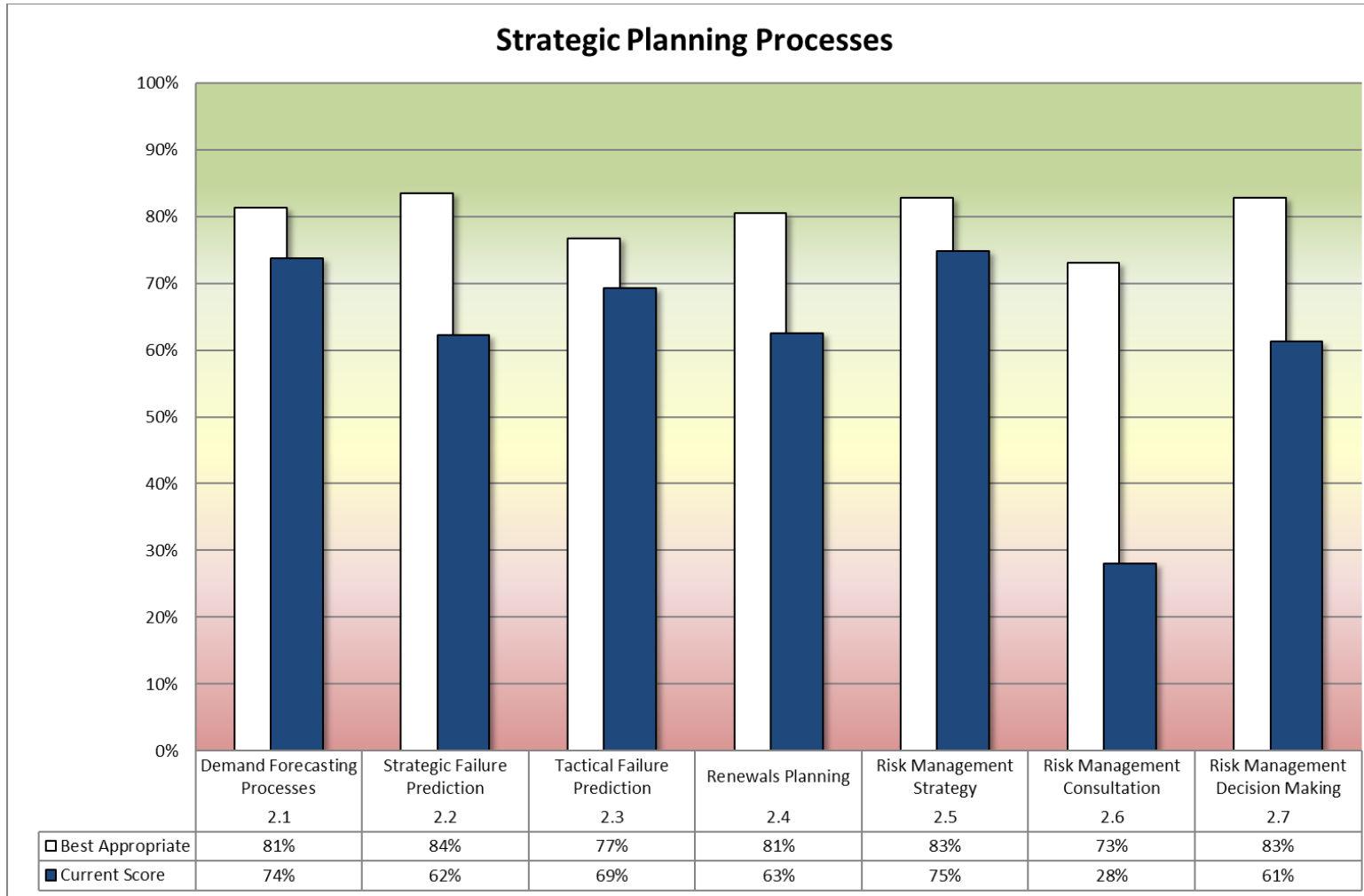
Strategic Planning Processes

Figure 26   Strategic planning processes – Vector

Vector's strategic planning processes are progressing towards a level that we consider to be best appropriate although note that risk management consultation is notably lower than other elements assessed. The completion of the identified improvement projects already underway, particularly the condition-based asset risk model, will close many of the following gaps:

- Demand forecasting processes – limited separate analysis of separate specific drivers of demand change and segmentation of usage patterns.

- Strategic failure prediction – criticality not systematically defined and applied, and limited analysis of network-wide degradation. Introduction of the CBARM should largely address these gaps.

- Tactical failure prediction – longer-term degradation modelling not undertaken, and criticality and risk ratings not yet systematically recorded against each asset. Failure prediction assessments tend to have a focus on safety reflecting the applicable technical standards.

- Renewals planning –analysis of 10-year renewals forecasts based on asset cohort issues, limited consideration of longer-term profiles.

- Risk management strategy – lifecycle activities and option selections are linked back to risk in the asset management plan, although it would be good to present all risks identified for action for completeness. Although key and emerging risks are presented in the Annual Report, there are opportunities to strengthen presentation of business and network risk/resilience profile. Workshopped (manual) optimisation of risk treatment options.

- Risk management consultation – although stakeholders are identified, very little has been done in engaging these groups to understand what security of supply risk they consider acceptable, and their "willingness-to-pay".

- Risk management decision-making – risk is used as a driver for decision-making, although there is not yet a systematic framework or approach to ensure that optimum options are implemented and that decisions are made consistently across the organisation. The planned implementation of the CBARM is expected to address this issue.

Asset Management Practices

AM Practices

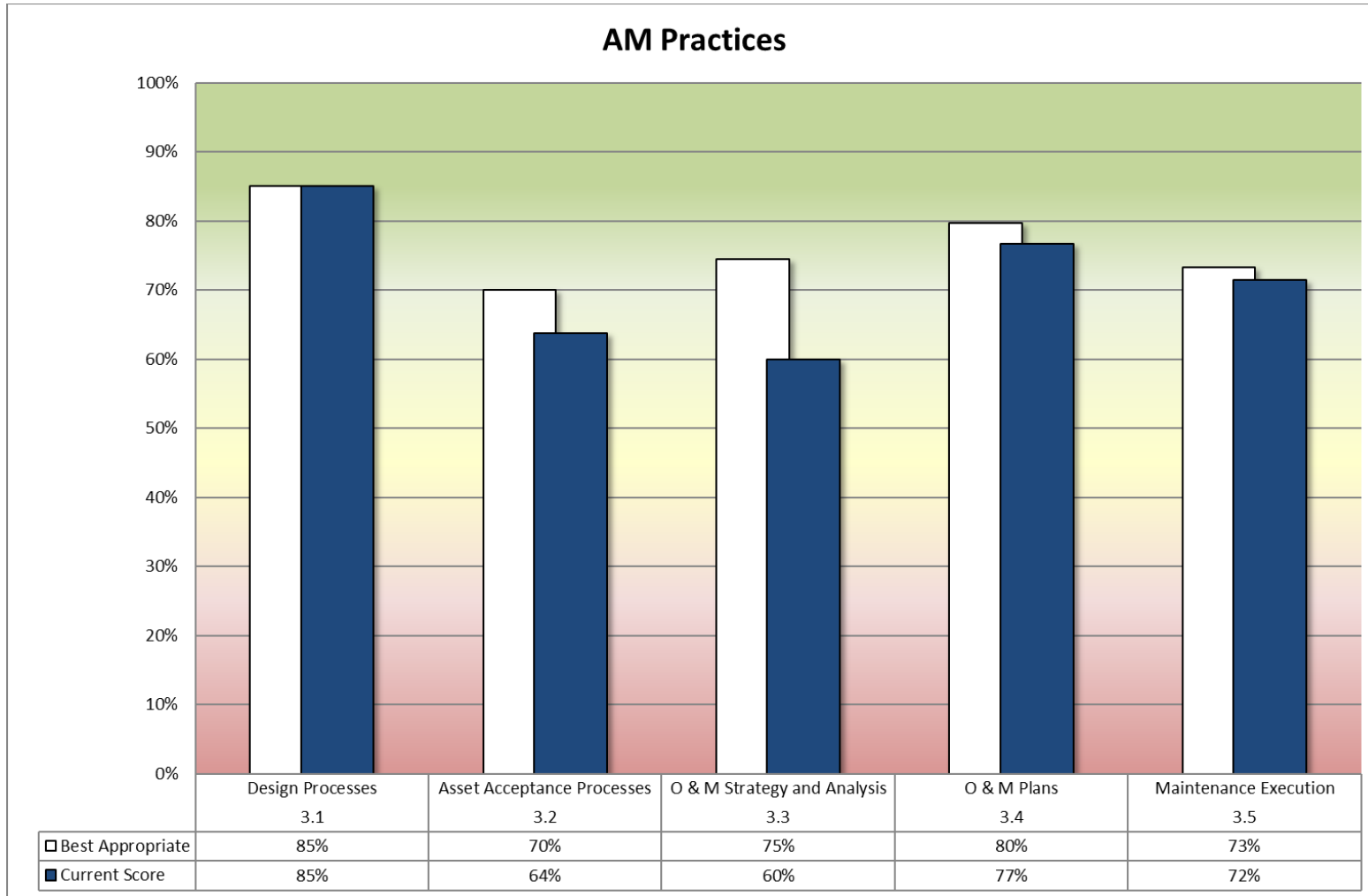|	Design Processes	Asset Acceptance Processes	O & M Strategy and Analysis	O & M Plans	Maintenance Execution
	3.1	3.2	3.3	3.4	3.5
☐ Best Appropriate	85%	70%	75%	80%	73%
■ Current Score	85%	64%	60%	77%	72%

Figure 27   Asset management practices – Vector

Vector has strong design procedures in place. These are at a level we consider best appropriate for this organisation.

Minor gaps in the remaining elements reflect:

- Asset acceptance procedures – review/audit of 3rd-party provided data limited to a sample only.

- O&M strategy and analysis – no systematic optimisation of reactive, preventative maintenance and renewals strategies.

- O&M plans - network risks are not strongly linked back to the broader asset management objectives and risk event identification tends to be somewhat focussed on safety reflecting the focus of the applicable technical standards.

- Maintenance execution – rigorous and systematic criticality analysis is not formally applied.

Information Systems

Information Systems

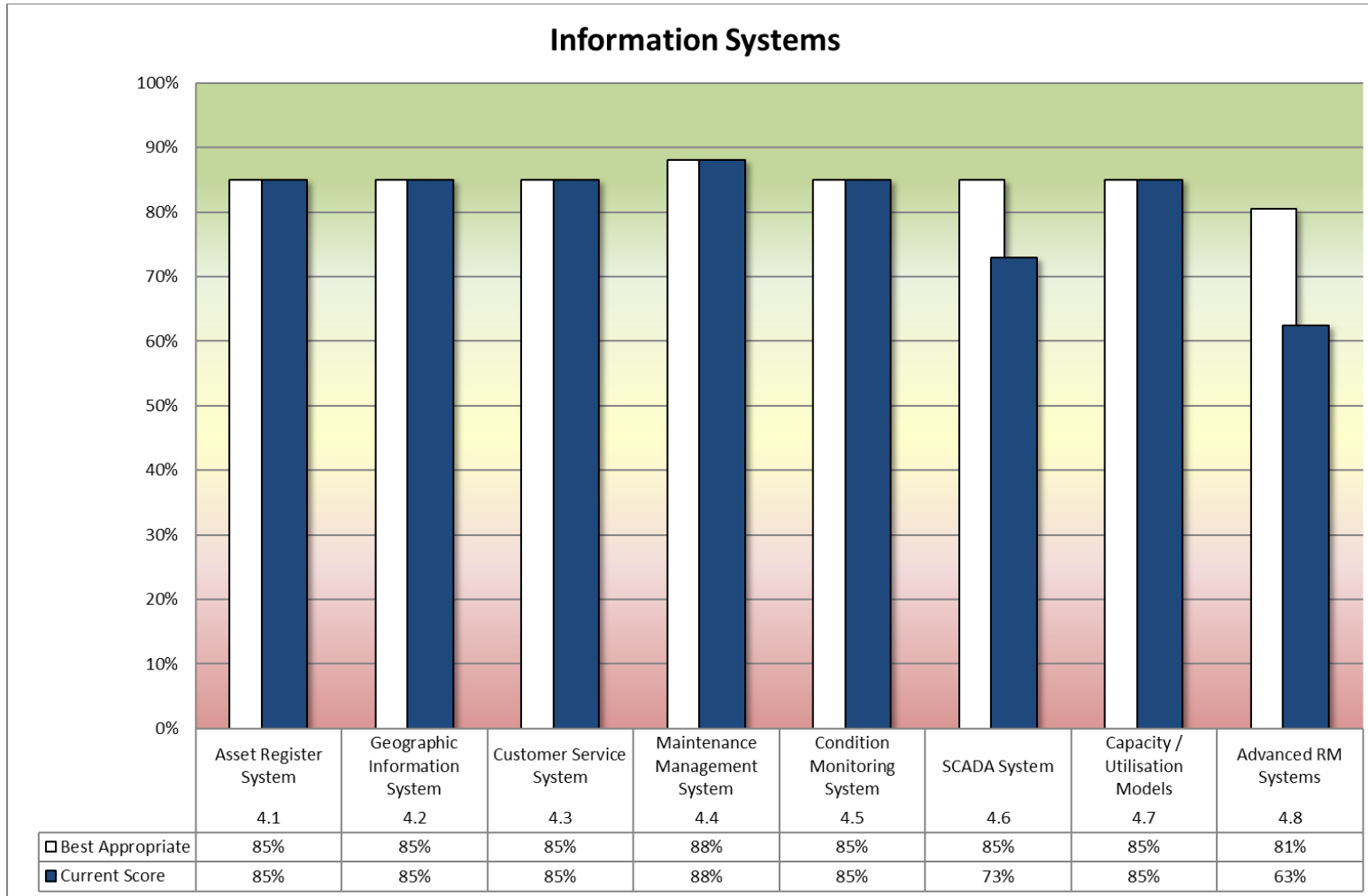|	Asset Register System	Geographic Information System	Customer Service System	Maintenance Management System	Condition Monitoring System	SCADA System	Capacity / Utilisation Models	Advanced RM Systems
	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8
☐ Best Appropriate	85%	85%	85%	88%	85%	85%	85%	81%
■ Current Score	85%	85%	85%	88%	85%	73%	85%	63%

Figure 28   Information systems – Vector

The industry-accepted systems configured and used by Vector are generally best appropriate for the organisation.

The minor gaps reflect:

- SCADA – limited integration with other asset management information systems. Not linked to the MMS..

- Advanced RM system – Active Risk Manager is used to manage risk, although this is not integrated with the main asset database to enable criticality and risk ratings to be held against each asset.

Organisational Tactics

Organisational Tactics

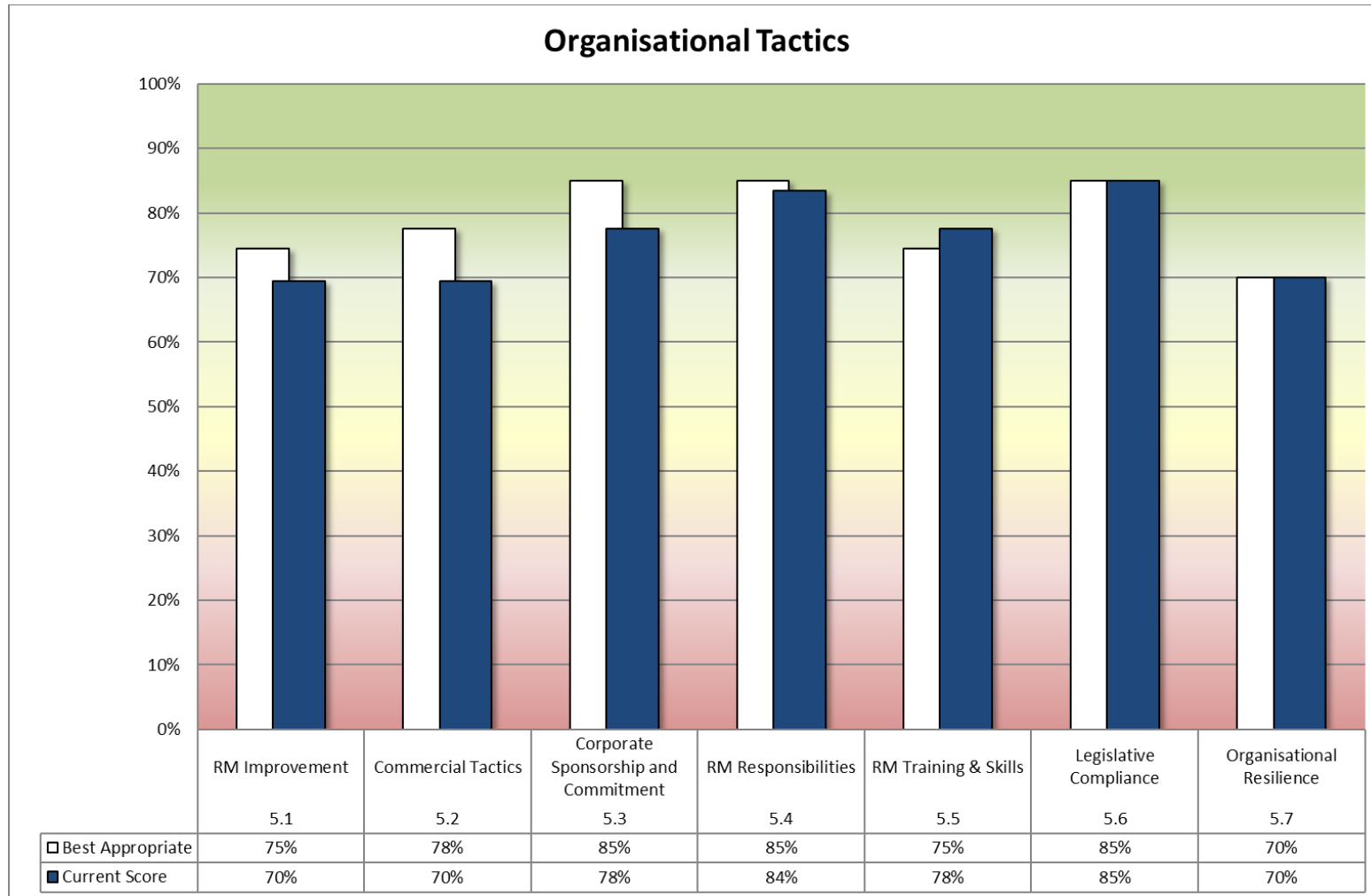|	RM Improvement	Commercial Tactics	Corporate Sponsorship and Commitment	RM Responsibilities	RM Training & Skills	Legislative Compliance	Organisational Resilience
	5.1	5.2	5.3	5.4	5.5	5.6	5.7
Best Appropriate	75%	78%	85%	85%	75%	85%	70%
Current Score	70%	70%	78%	84%	78%	85%	70%

Figure 29   Organisational tactics – Vector

Vector has strong legislative compliance processes in place, which are at a level we consider to be best appropriate. We believe that Vector is well on the way to establishing its practices at a level which demonstrates sound corporate commitment to asset management and risk management, and many of the identified gaps should be reasonably straightforward to close.

Minor gaps in the remaining elements reflect:

- RM improvement – programme of formalised benchmarking could be strengthened and self-assessment of AM maturity is undertaken using the AMMAT tool which could be externally verified periodically. The assessment undertaken for this report can be used to compare organisations at a more detailed level;

- Commercial tactics – processes to ensure that risks associated with outsourced activities are managed in accordance with Vector risk processes could be strengthened. No quality system in place;

- Corporate sponsorship and commitment – there appears to be good support for strengthening risk management. However, a documented risk management plan could close this gap;

- RM responsibilities – strong processes to translate risk management improvements into individual and team goals. A systematic competency framework could further strengthen this element;

- RM training and skills - a systematic competency framework could strengthen this element;

3.6   Powerco

3.6.1   Context

Powerco's gas distribution system starts where Powerco takes custody of a retailer's gas from the Transmission System Operator (TSO) at a designated gate station handover point. It usually ends at the inlet of the Gas Measurement System (GMS) that supplies the end user. Five separate regions are serviced as shown in the figure below:

The gas network comprises:

- mains, the underground pipes, operating at different pressures that are typically placed within the road corridor to move gas to individual service points;

- services, the smaller underground pipes that branch off the mains and deliver gas to individual customers; and

- additional equipment providing pressure regulation, isolation, corrosion protection, safety and protection and communication of data (SCADA).

Together these assets supply around 108,000 customers (around 37% of total gas connections in New Zealand) in the North Island and comprise more than 6,300km of mains and service pipes. Powerco's network is the second largest in New Zealand in terms of length and number of customers connected.
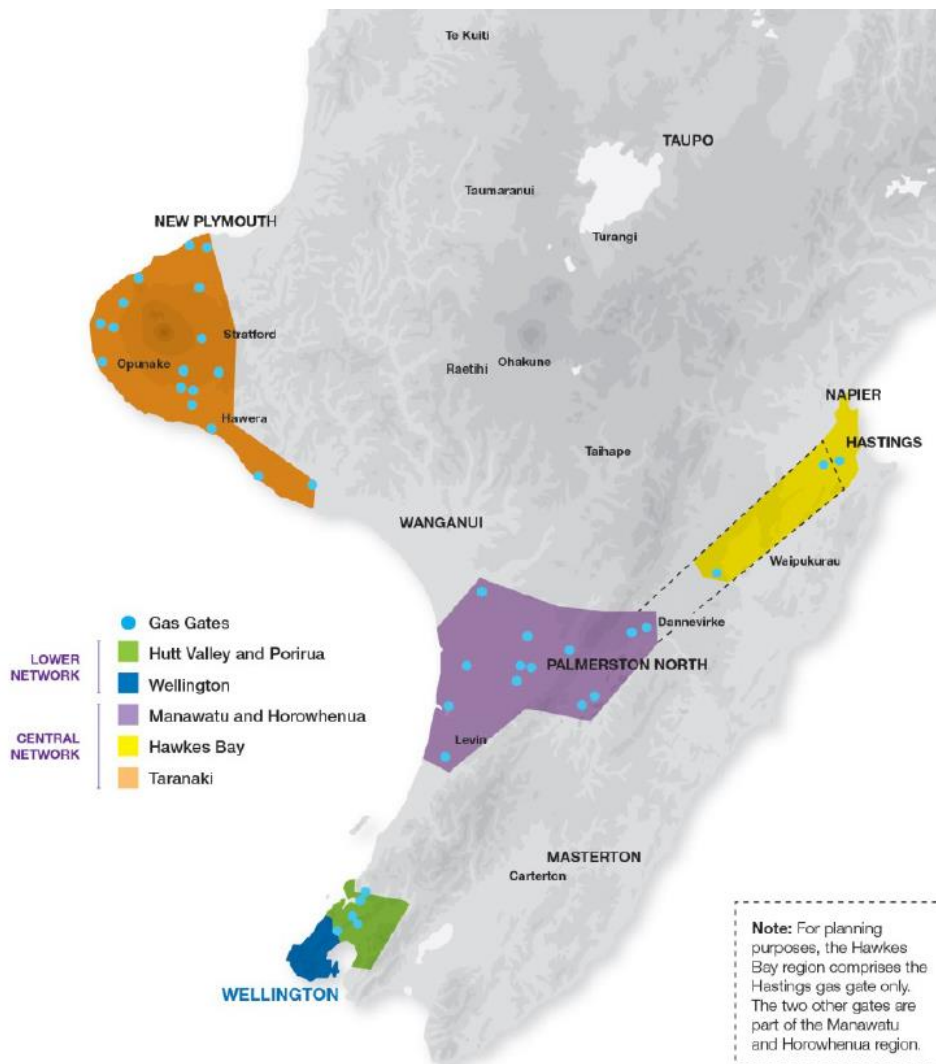

Figure 30   Powerco networks

3.6.2   Overall Findings

Gap Analysis Summary

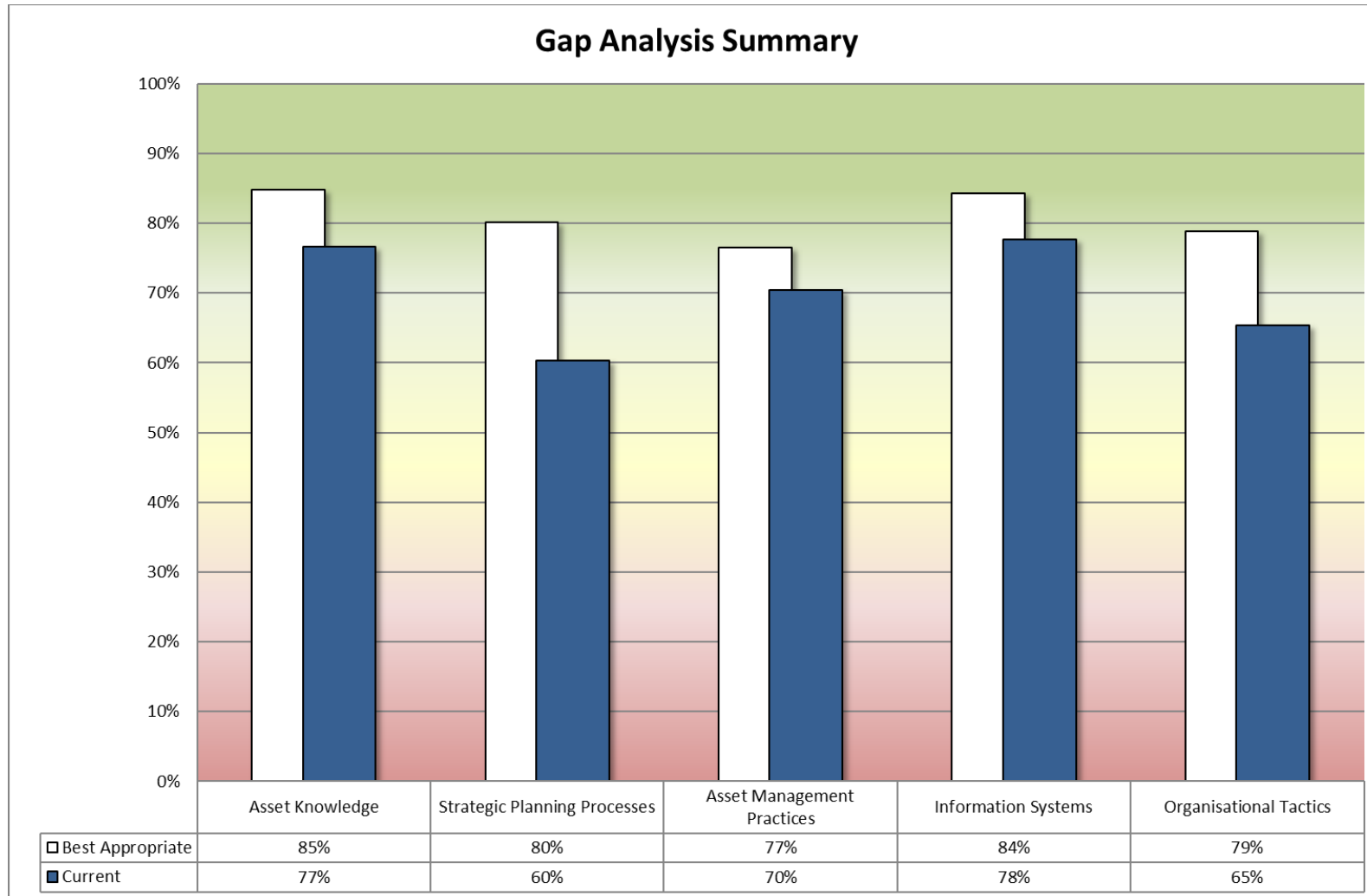|	Asset Knowledge	Strategic Planning Processes	Asset Management Practices	Information Systems	Organisational Tactics
☐ Best Appropriate	85%	80%	77%	84%	79%
■ Current	77%	60%	70%	78%	65%

Figure 31   Gap analysis summary – Powerco

Powerco is approaching the level of risk management we believe to be best appropriate for such an organisation with clear evidence of ongoing improvement activities, including the ongoing work to introduce significant systems (such as SAP) and tools (such as Copperleaf) to improve integration and systemise optimisation efforts for organisational consistency.   Powerco's demand modelling was identified as an aspect of particular strength.

Many of the identified gaps will be addressed through current improvement activities. The key gaps reflect:

- A slightly narrow focus to the network risk management. This reflects the adoption of technical standards with somewhat prescriptive risk management approaches. Although consequence impact areas rated include aspects beyond health and safety, the events themselves tend to have been identified within an overall network integrity/public safety context. Given that this complies with accepted standards, we cannot say that it is inadequate as such. However, we believe an approach which is tied clearly to the broader asset management objectives would strengthen Powerco's risk management.

- Limited understanding of what security of supply risk external stakeholders consider acceptable.

- Strategic mains (large) and high consequence areas defined. These assets are managed more closely than other assets. No rigorous asset-specific criticality framework linked to risk frameworks to enable repeatable and consistent application across the networks and across asset groups.

- Limited systematic optimisation of activities associated with risks and/or drawing on risk principles.

- Although there is a reasonable understanding of infrastructure failure profiles and renewal needs on a cohort basis in the first ten years, there is limited understanding of these aspects in the longer-term.

- Some systems are not integrated to exploit their ease of use and functionality.

Further details are presented in the following sections. Details of the assessment are presented in Appendix D.

3.6.3   Findings by Category
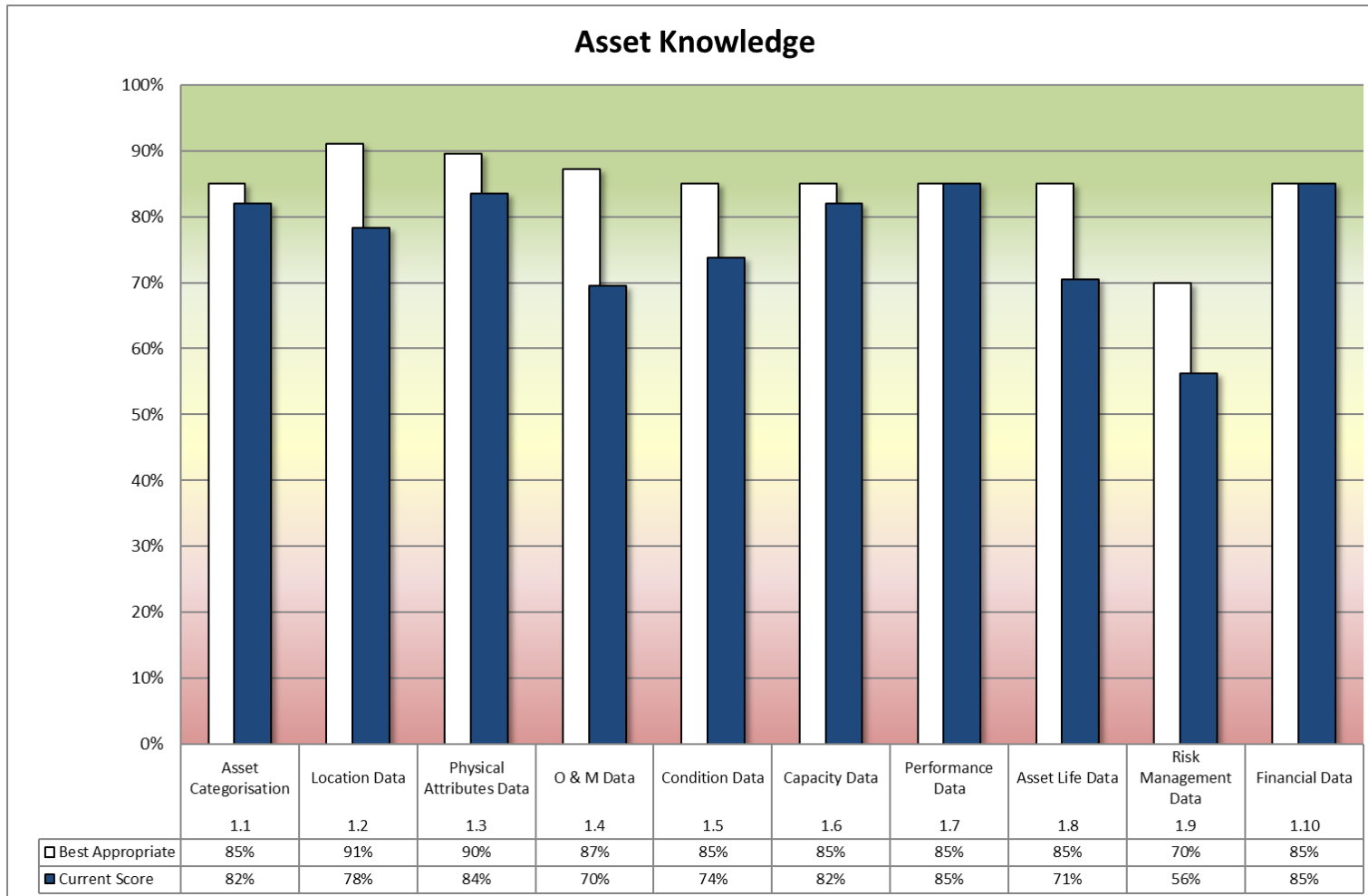
Asset Knowledge

Figure 32   Asset knowledge – Powerco

Powerco has a good knowledge-base of performance and financial data. We consider that this is at a level that is best appropriate for this organisation, although would like to specifically note the importance of continuous improvement beyond the short-term. This is evidenced as a progressive shift in stakeholder and industry expectations.

Gaps in the remaining elements reflect the following. These will largely be addressed through the current project to establish SAP:

- Asset categorisation – Powerco are currently progressing the development of the asset hierarchies for the new SAP system.

- Location data – some data gaps, contributed to through legacy offshore digitisation of paper-based information. This is currently being addressed.

- Physical attributes - some missing attribute data source records.

- O&M data – limited recording of failure history within JDE. Processes for managing works orders against assets and ensuring changes to the assets are captured could be strengthened.

- Condition data – some data gaps and extrapolation used reflecting asset cohort approach. Opportunity to strengthen formalised processes to optimally capture, update and report on asset condition data.

- Capacity data – documented processes to capture and update utilisation could be strengthened.

- Asset life data – some gaps in install dates, and no systematic recording and review of expected lives within the asset data.

- Risk management data – network risk data by asset class currently held within MS Excel spreadsheets although work planned to establish SAP ERM in the next few months. Critical assets not systematically defined.
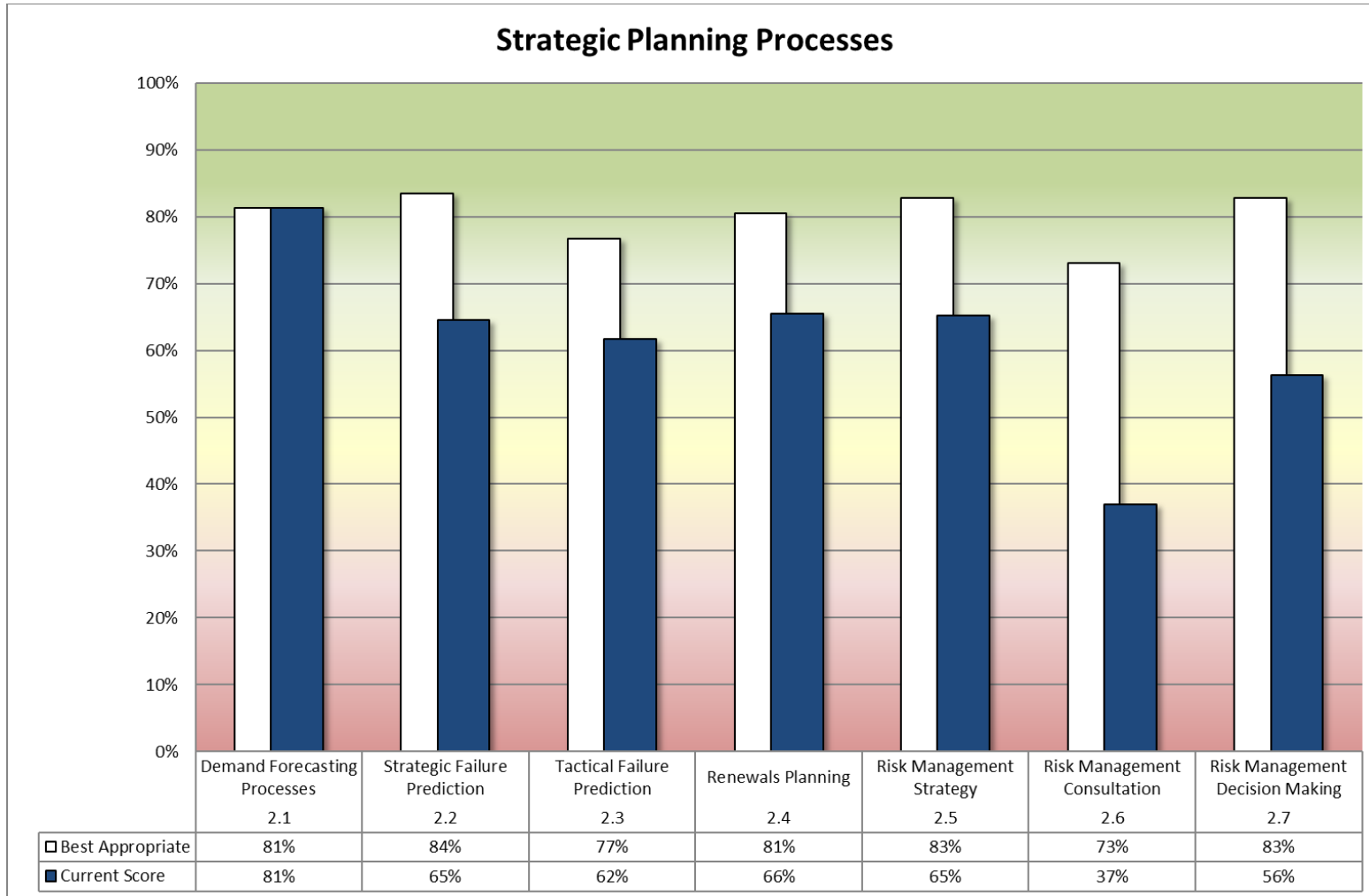
Strategic Planning Processes

Figure 33   Strategic planning processes – Powerco

Powerco has strong demand forecasting processes which we consider to be at a best appropriate level. Powerco is progressing towards a level that we consider to be best appropriate for the remaining elements and note that risk management consultation, although notably lower than other elements assessed, is higher than all other GPBs. The completion of the identified improvement projects already underway will go some way to closing the following gaps:

- Strategic failure prediction – criticality not systematically defined and applied, and limited analysis of network-wide degradation.

- Tactical failure prediction – longer-term degradation modelling not undertaken, and criticality and risk ratings not yet recorded in the asset management information system. Failure prediction assessments tend to have a focus on safety reflecting the applicable technical standards.

- Renewals planning –analysis of 10-year renewals forecasts based on asset cohort issues, limited consideration of longer-term profiles.

- Risk management strategy – network risks are not strongly linked back to the broader asset management objectives and tend to have a focus on Powerco and safety at an asset-class level reflecting the focus of the applicable technical standards. No systematic or formal articulation of business risk profile, or network risk/resilience profile. No formal assessment is undertaken to evaluate whether Powerco is "over-controlled" and there is limited optimisation of risk treatment options using a manual process.

- Risk management consultation – Stakeholders are identified, and work has been undertaken to engage these groups to understand what security of supply risk they consider acceptable, and their "willingness-to-pay". However, as none of the customers interviewed expressed dissatisfaction with supply levels, the concept of paying more to get a satisfactory level of supply was not tested. Providing current and future scenarios with costed options to the full sample data-set could strengthen this area.

- Risk management decision-making – risk is used as a driver for decision-making, although is focussed mainly on risk to Powerco and safety associated with network integrity, rather than a broader application. There is not yet a systematic framework or approach to ensure that optimum options are implemented and that decisions are made consistently across the organisation, although planned implementation of Copperleaf is expected to address this issue.

Asset Management Practices

AM Practices

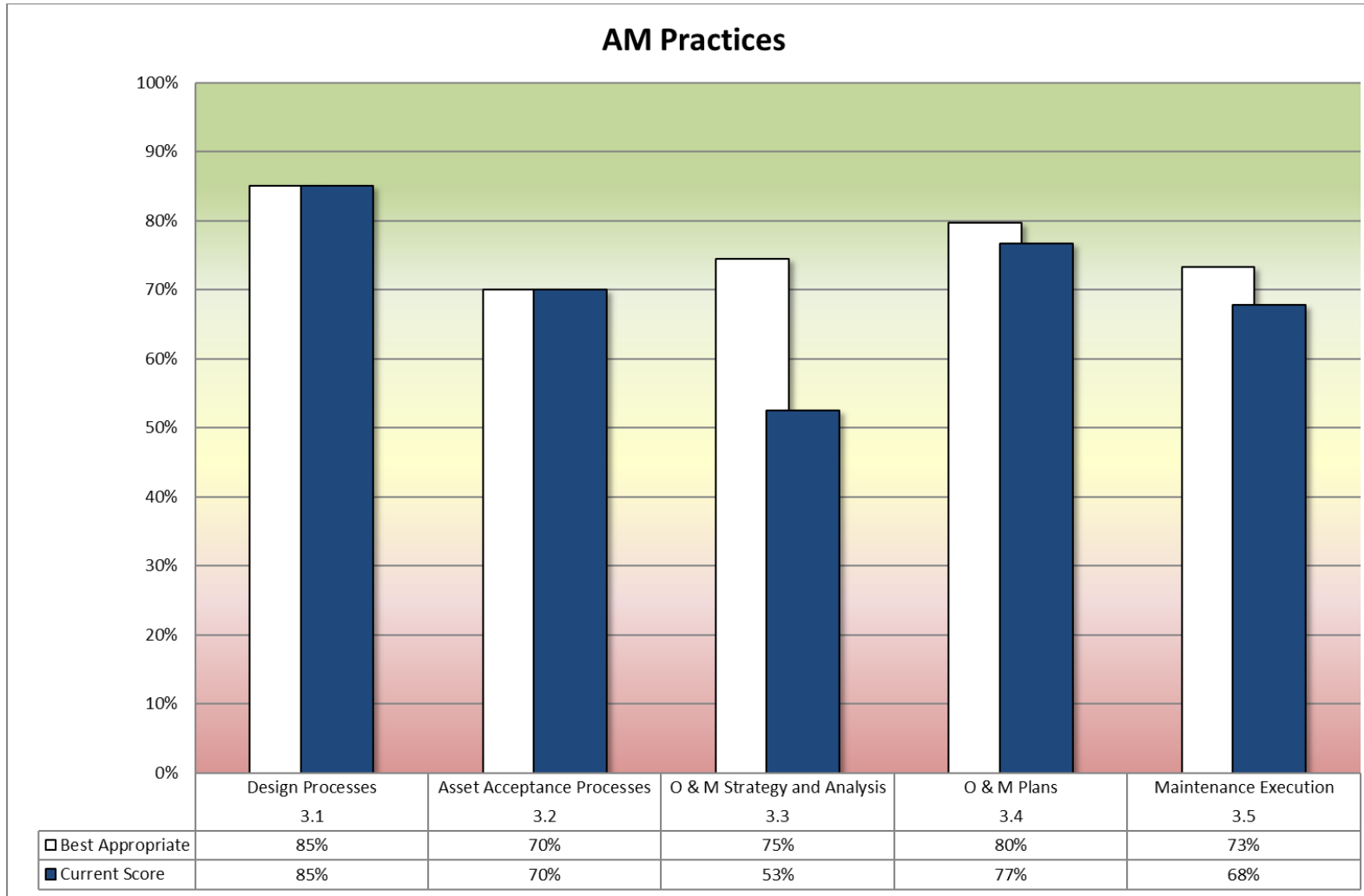|	Design Processes 3.1	Asset Acceptance Processes 3.2	O & M Strategy and Analysis 3.3	O & M Plans 3.4	Maintenance Execution 3.5
☐ Best Appropriate	85%	70%	75%	80%	73%
■ Current Score	85%	70%	53%	77%	68%

Figure 34   Asset management practices – Powerco

Powerco has strong design and asset acceptance procedures in place. These are at a level we consider best appropriate for this organisation.

Minor gaps in the remaining elements reflect:

- O&M strategy and analysis – no systematic optimisation of reactive, preventative maintenance and renewals strategies although this should be addressed with the introduction of Copperleaf. Limited root cause analyses undertaken.

- O&M plans - network risks are not strongly linked back to the broader asset management objectives and tend to have a focus on safety reflecting the focus of the applicable technical standards.

- Maintenance execution –Network risks are focussed on safety issues associated with network integrity and not strongly linked back to the broader asset management objectives. No formal process to specifically address High Impact Low Probability events.

Information Systems

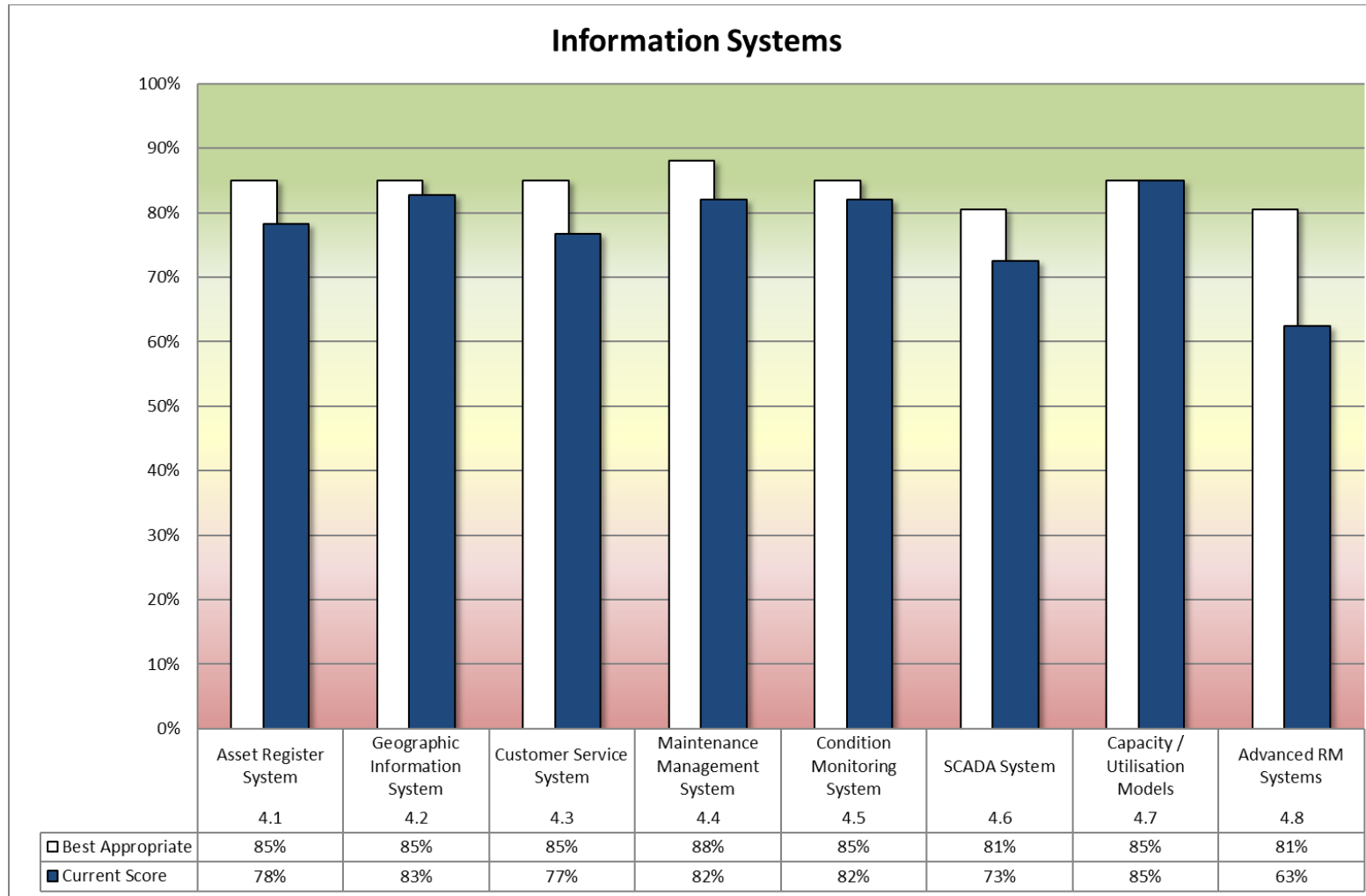|	Asset Register System	Geographic Information System	Customer Service System	Maintenance Management System	Condition Monitoring System	SCADA System	Capacity / Utilisation Models	Advanced RM Systems
	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8
□ Best Appropriate	85%	85%	85%	88%	85%	81%	85%	81%
■ Current Score	78%	83%	77%	82%	82%	73%	85%	63%

Figure 35   Information systems – Powerco

The systems configured and used by Powerco are largely best appropriate for the organisation. The system used for capacity/utilisation (Synergi) is an industry-accepted system. Work is underway to establish a number of other widely accepted and/or specialist systems, including SAP and Copperleaf which will largely address the minor gaps in the remaining elements:

- Asset register – ArcGIS and ArcFM are used as the main asset register. There are interfaces with the finance system but there are different levels of granularity. Asset data-change audit trails could be strengthened.

- GIS – interfacing issues as noted above.

- Customer service system – limited integration with the asset register and a "fault-based" system means that defects need to be manually entered against the asset rather than a comprehensive failure history.

- Maintenance management system (MMS) – JDE not integrated with the main asset database as above. Establishment of SAP will address these issues.

- Condition monitoring system – as MMS comment above.

- SCADA – currently linked to the outage management system, but not the MMS.

- Advanced RM system – spreadsheets are currently the main system used for risk management, although Powerco plans to have SAP ERM module established by 1 August 2019.
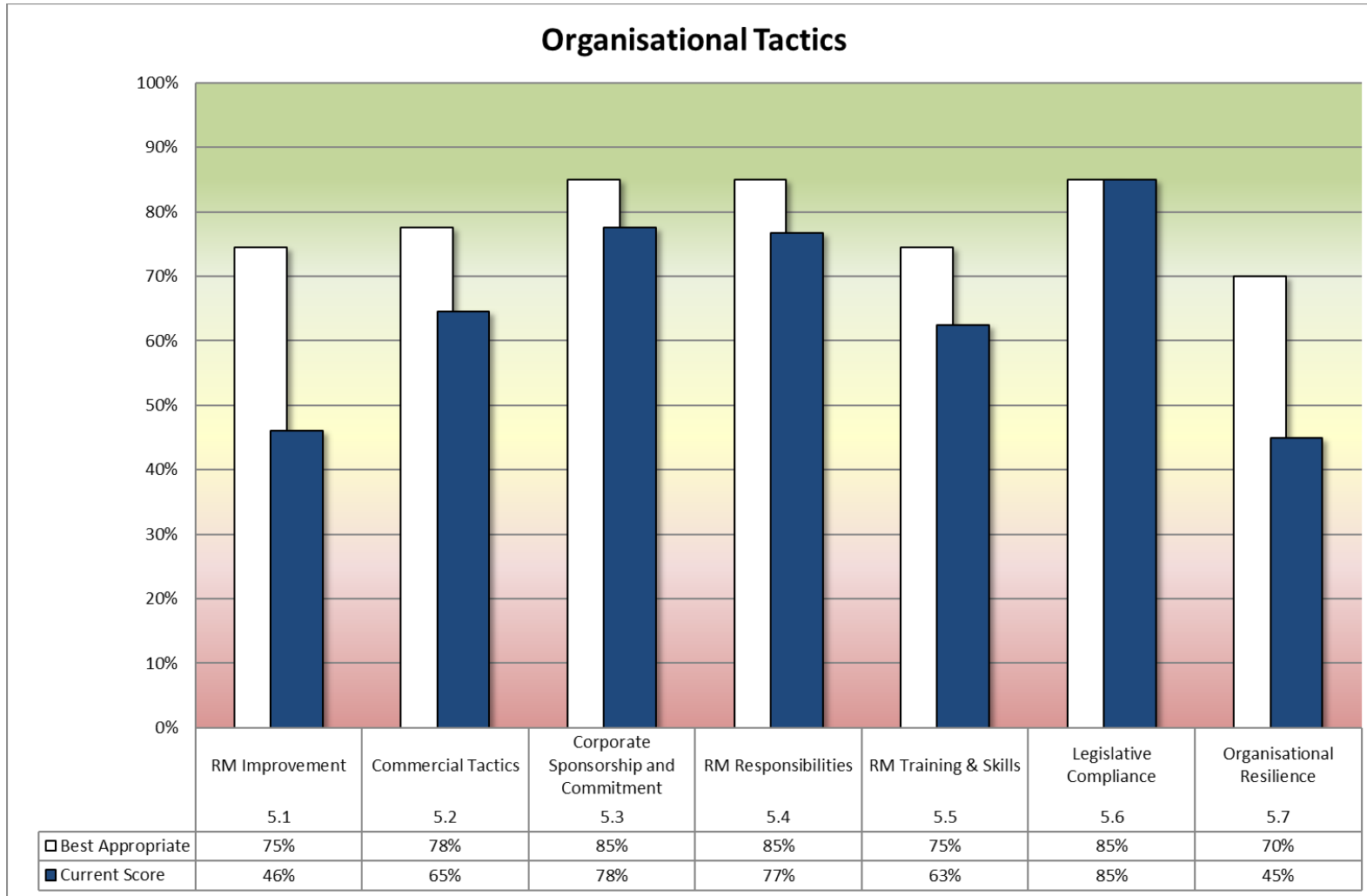
Organisational Tactics

Figure 36   Organisational tactics – Powerco

Powerco has strong legislative compliance processes in place, which are at a level we consider to be best appropriate. We believe that Powerco is on the way to establishing its practices at a level which demonstrates sound corporate commitment to asset management and risk management, and many of the identified gaps should be reasonably straightforward to close.

Gaps in the remaining elements reflect:

- RM improvement – no development of a systematic improvement plan to enable regular progress reviews, although recent ISO 55001 review should generate this. No programme of formalised benchmarking in place. Self-assessment of AM maturity is undertaken using the AMMAT tool which could be externally verified periodically. The assessment undertaken for this report can be used to compare organisations at a more detailed level.

- Commercial tactics – processes, to ensure that risks associated with outsourced activities are managed in accordance with Powerco risk processes, could be strengthened. No quality system in place.

- Corporate sponsorship and commitment – adequate support for strengthening risk management. No formal risk management plan document in place;

- RM responsibilities – a systematic competency framework would strengthen this element.

- RM training and skills - a systematic competency framework would strengthen this element.

- Organisational resilience – although some work has been undertaken on understanding organisational resilience and preparedness, this is more of a risk-type approach. Use of a self-assessment tool, such as OrgRes, would enable a better understanding of the organisational resilience.

3.7   GasNet

3.7.1   Context

GasNet is 100% owned by Whanganui District Council Holdings Limited, a Whanganui District Council "Council Controlled Trading Organisation". GasNet commenced trading on 1 July 2008 after purchasing the network (and metering) business from Wanganui Gas Limited. On 30 June 2017 GasNet Limited and its parent Wanganui Gas Limited were amalgamated to become GasNet Limited.

GasNet's origins go back to the late 19th century when in 1879 Wanganui Gas Company Limited was formed as a private enterprise to reticulate manufactured gas within the city of Whanganui.

GasNet owns and operates five discrete natural gas networks as shown below. Each network is connected by a Sales Gate station to the First Gas Limited (previously Vector Limited) owned transmission pipeline. The five networks are known as Whanganui, Marton, Bulls, Waitotara, and Flockhouse. These networks include 399 km of mains pipeline, 13,000 services and 15 District Regulator Stations.
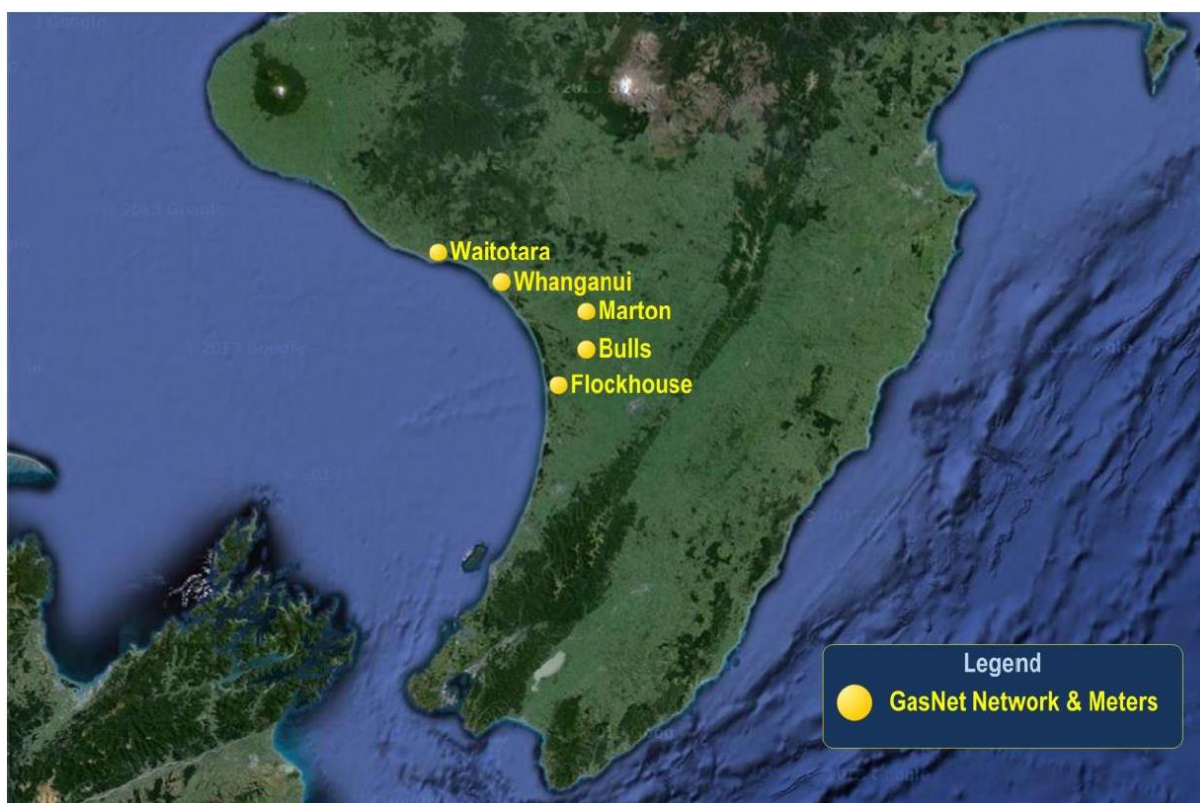

Figure 37   GasNet networks

3.7.2   Overall Findings

Gap Analysis Summary

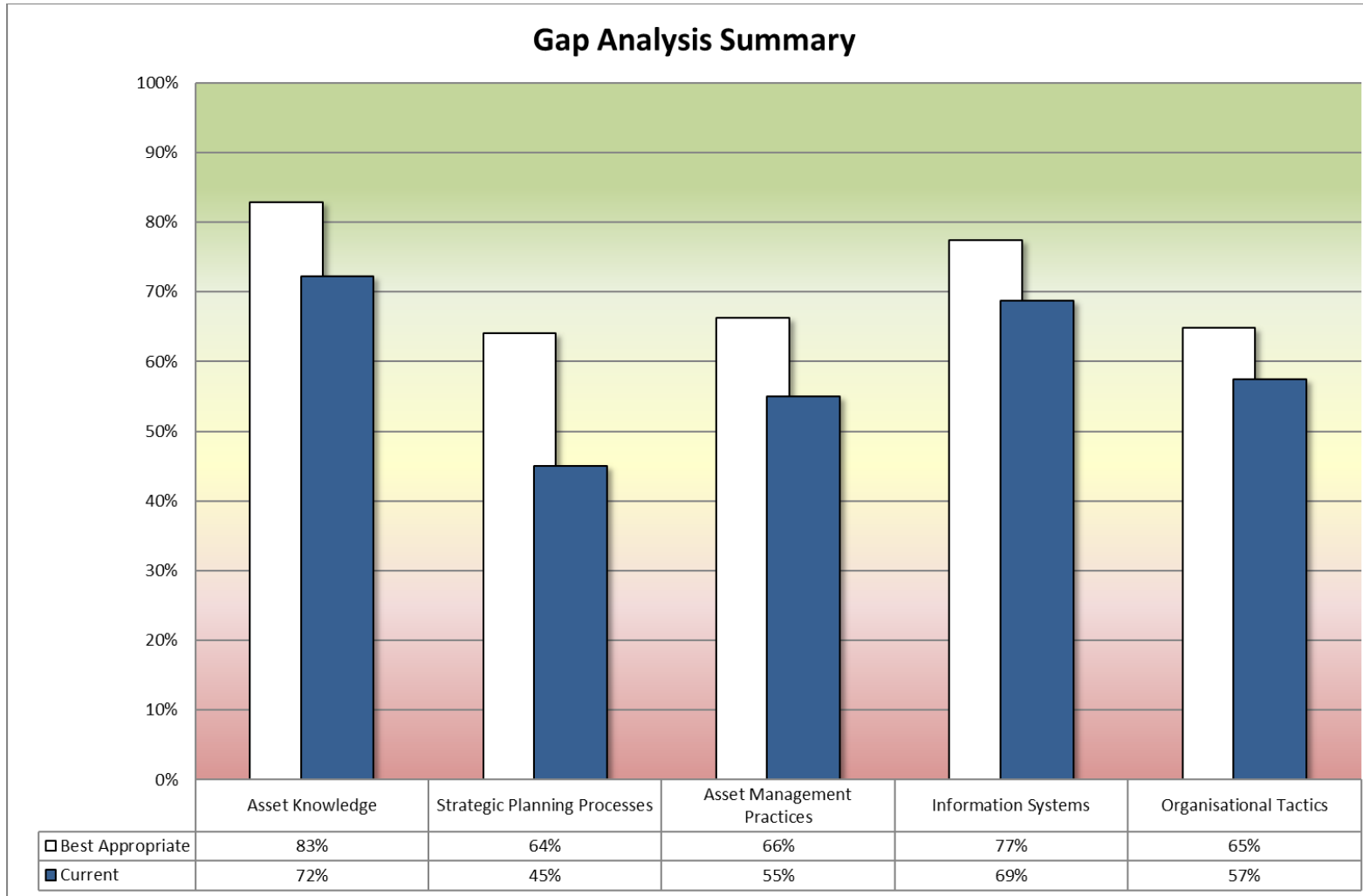|	Asset Knowledge	Strategic Planning Processes	Asset Management Practices	Information Systems	Organisational Tactics
☐ Best Appropriate	83%	64%	66%	77%	65%
■ Current	72%	45%	55%	69%	57%

Figure 38   Gap analysis summary – GasNet

GasNet is approaching the level of risk management we believe to be best appropriate, noting that the size and nature of the organisation, its infrastructure and the services it provides mean that lower levels of sophistication would be expected. There is evidence of ongoing improvement activities, including the work to confirm the risk profile of individual assets using material, size, operating conditions, location and history to review their asset life remaining, and the plans to introduce a new asset management information system.

GasNet is a small organisation, and as such, relies heavily on the technical ability and drive of a few key individuals. GasNet have identified loss of institutional knowledge as a key risk.

Many of the identified gaps will be addressed through current improvement activities. The key gaps reflect:

- A slightly narrow focus to the network risk management. This reflects the adoption of technical standards with somewhat prescriptive risk management approaches. Although consequence impact areas rated include aspects beyond health and safety, the events themselves tend to have been identified within an overall network integrity/public safety context. Given that this complies with accepted standards, we cannot say that it is inadequate as such. However, we believe an approach which is tied clearly to the broader asset management objectives would strengthen GasNet's risk management.

- Limited understanding of what security of supply risk external stakeholders consider acceptable.

- No systematic criticality framework in place[12].

- Limited systematic optimisation of activities associated with risks and/or drawing on risk principles.

- Although there is a reasonable understanding of infrastructure failure profiles and renewal needs on a cohort basis in the first ten years, the understanding of these aspects reduces in the longer-term[13].

- Some systems are not integrated to exploit their ease of use and functionality.

Further details are presented in the following sections. Details of the assessment are presented in Appendix E.

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[12] Although network assets (mains) are rated against a criteria based on operating pressure and asset size.
[13] Whilst not documented a consistent approach to the renewal of older metallic mains is expected to continue to be based upon economic and safety factors.

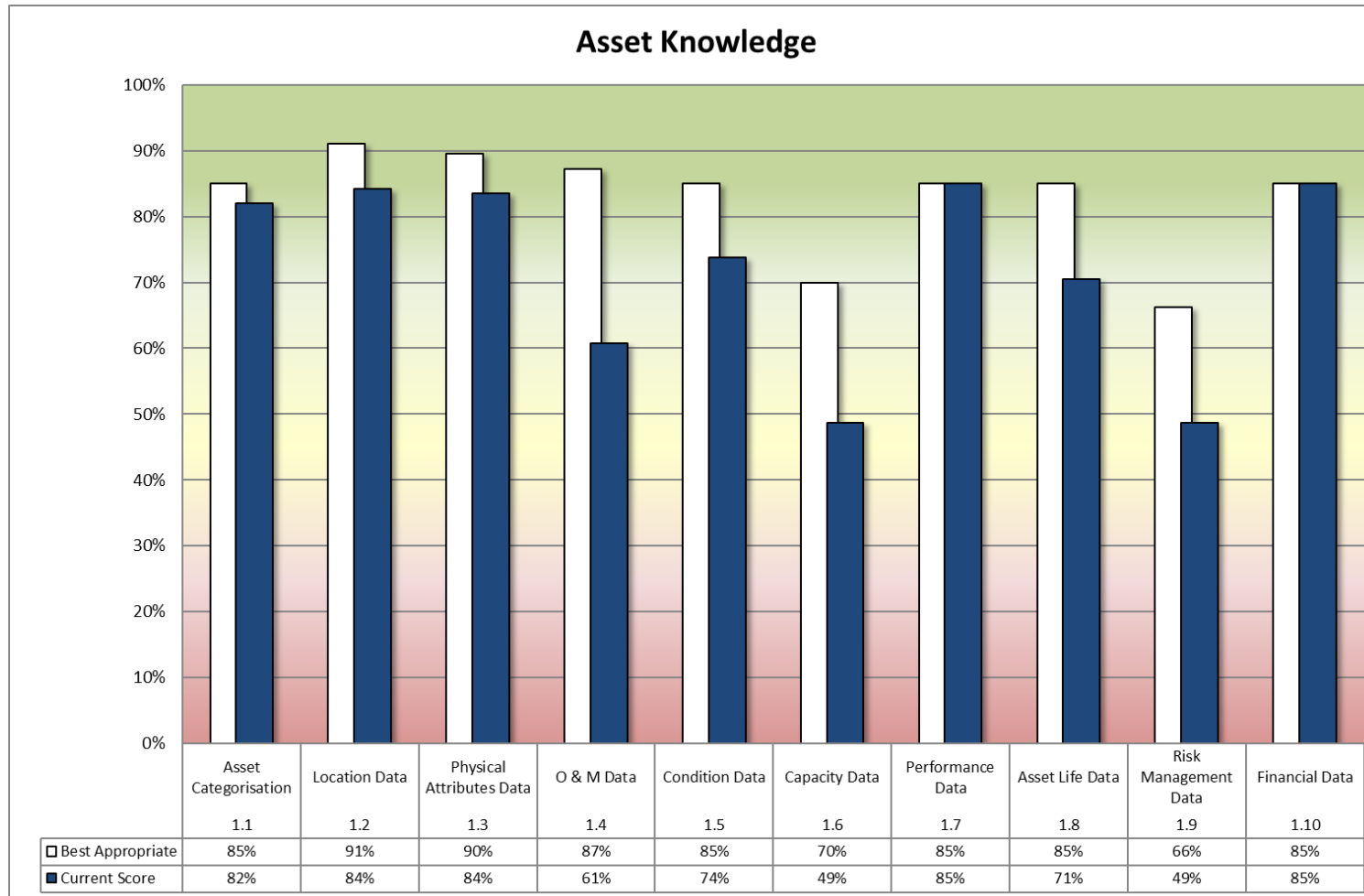### 3.7.3   Findings by Category

Asset Knowledge

Figure 39   Asset knowledge – GasNet

GasNet has a good knowledge-base of performance and financial data. We consider that this is at a level that is best appropriate for this organisation, although would like to specifically note the importance of continuous improvement. This is evidenced as a progressive shift in stakeholder and industry expectations.

Gaps in the remaining elements reflect the following. Many of these should be addressed should a new asset management information system be established well:

- Asset categorisation – ArcGIS is used as the primary asset register although above ground assets are managed outside of the GIS system in an Access Database.

- Location data – data gaps, contributed to by the loss of historic information pre-GIS when abandoned pipes were simply erased from the paper-based system.

- Physical attributes - some missing attribute data source records.

- O&M data – limited recording of failure and maintenance history within FieldGO and no direct linkage with assets. Processes for managing works orders against assets and ensuring changes to the assets are captured could be strengthened.

- Condition data – some data gaps and extrapolation used reflecting asset cohort approach. Opportunity to strengthen formalised processes to optimally capture, update and report on asset condition data.

- Capacity data – three of the five Synergi models required are complete.

- Asset life data – Although install dates are held for all assets in GasNet's Regulatory Asset Base (RAB) model, some gaps in install dates in the GIS data, and no systematic recording and review of expected lives within the asset data. This will be addressed when GasNet implements its new Asset Management System later in 2019.

- Risk management data – network risk data by asset class currently held within Risk Manager, no risk ratings held against individual assets. Critical assets not systematically defined.
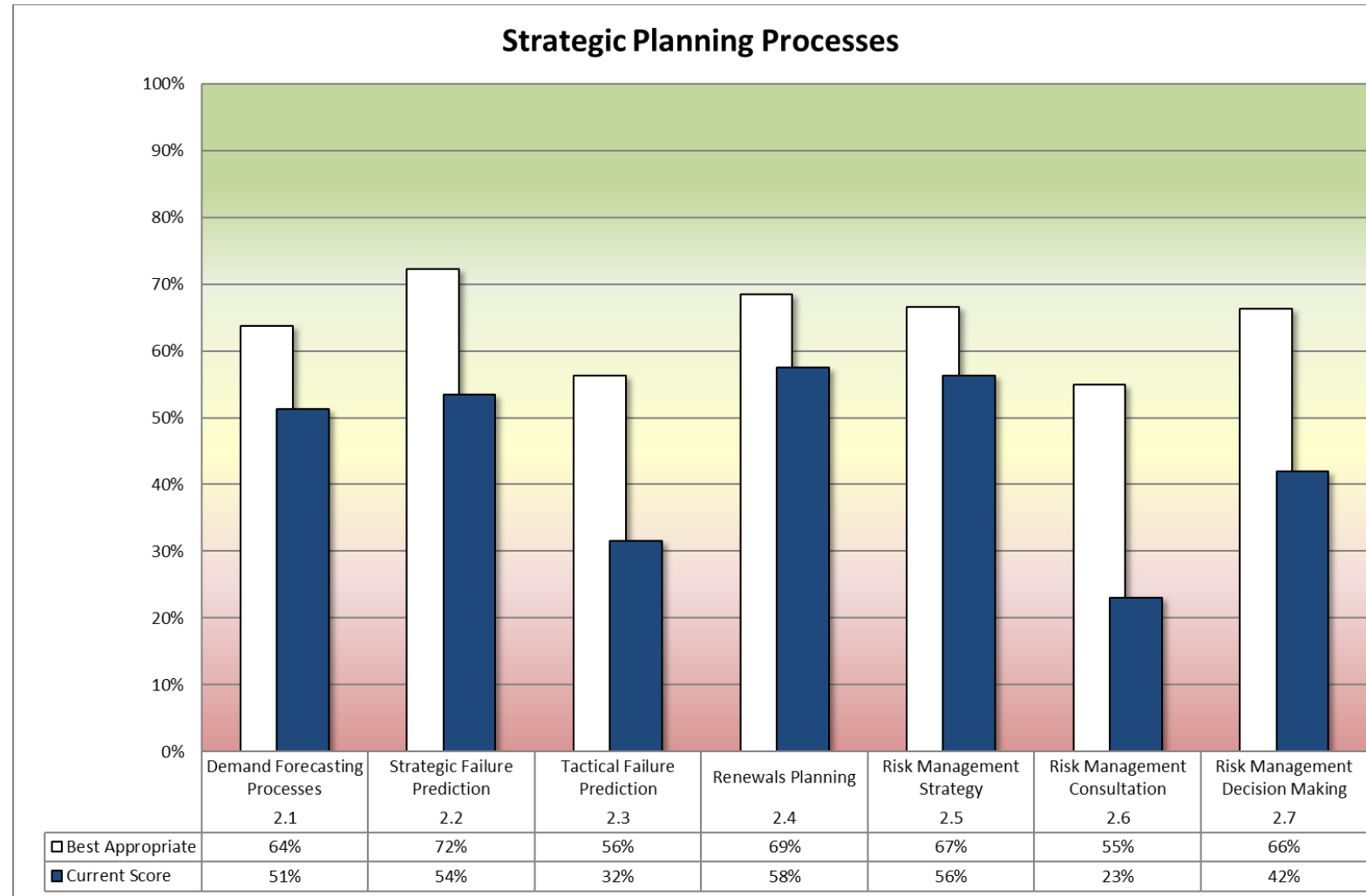
Strategic Planning Processes

Strategic Planning Processes

	Demand Forecasting Processes 2.1	Strategic Failure Prediction 2.2	Tactical Failure Prediction 2.3	Renewals Planning 2.4	Risk Management Strategy 2.5	Risk Management Consultation 2.6	Risk Management Decision Making 2.7
☐ Best Appropriate	64%	72%	56%	69%	67%	55%	66%
■ Current Score	51%	54%	32%	58%	56%	23%	42%

Figure 40   Strategic planning processes – GasNet

GasNet is making progress towards a level that we consider to be best appropriate for most of the strategic planning elements although note that risk management consultation is notably lower than other elements assessed, and both tactical failure prediction and risk management decision-making have a way to go. The completion of the identified improvement projects already underway will go some way to closing the following gaps:

- Demand forecasting processes – models still being developed, including their use for future demand impacts.

- Strategic failure prediction – criticality not systematically defined and applied, and limited analysis of network-wide degradation and future capacity "failure" forecasts.

- Tactical failure prediction – no formal FMEA undertaken. No longer-term degradation modelling not undertaken, and criticality and risk ratings not yet recorded in the asset management information system. Failure prediction assessments tend to have a focus on safety reflecting the applicable technical standards and are based on asset-cohorts.

- Renewals planning –analysis of 10-year renewals forecasts based on asset cohort issues, limited consideration of longer-term profiles.

- Risk management strategy – network risks are not strongly linked back to the broader asset management objectives and tend to have a focus on safety at an asset-class level reflecting the focus of the applicable technical standards. Types of risk are discussed in general terms in the AM plan, although there is no "risk management plan" as such clearly documenting network risks requiring action, and what actions are proposed to address each of these risks. The Safety and Operating Plan is driven by risk but the linkages are not always clear. No systematic or formal articulation of business risk profile, or network risk/resilience profile. No formal assessment is undertaken to evaluate whether GasNet is "over-controlled" and there is limited optimisation of risk treatment options using a manual process.

- Risk management consultation – although stakeholders are identified, very little has been done in engaging these groups to understand what security of supply risk they consider acceptable, and their "willingness-to-pay".

- Risk management decision-making – risk is managed within GasNet, and contributes to decision-making, although a more technical standards approach dominates. It is noted that a risk-based approach is inherent in these standards. There is not yet a systematic framework or approach to ensure that optimum options are implemented and that decisions are made consistently across the organisation.
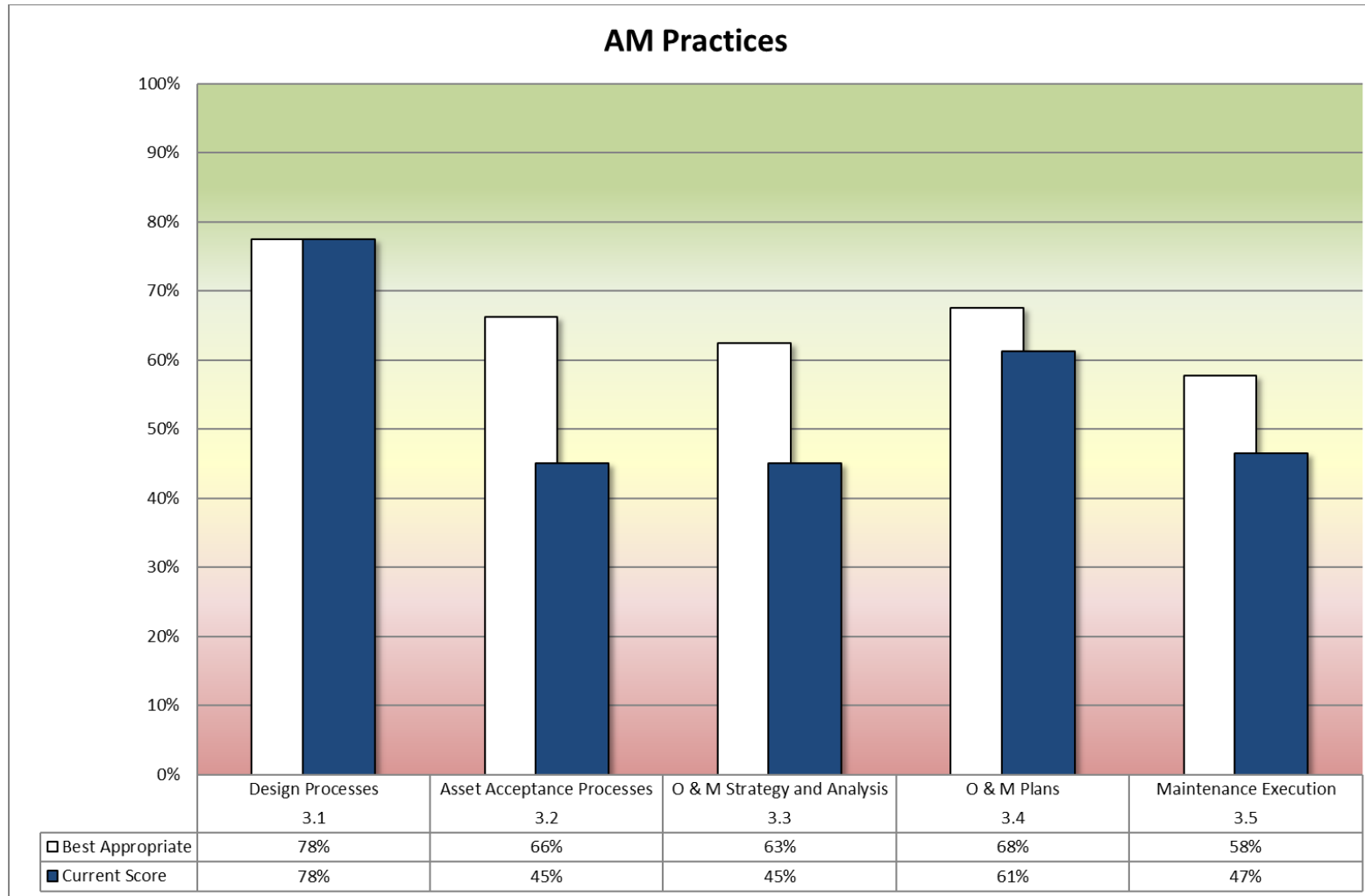
Asset Management Practices

Figure 41   Asset management practices – GasNet

GasNet has strong design procedures in place. These are at a level we consider best appropriate for this organisation.

Gaps in the remaining elements reflect:

- Asset acceptance processes – while asset acceptance processes occur for the routine-work undertaken by in-house staff, these are not documented. More complex projects have more formalised checklists developed.

- O&M strategy and analysis – although O&M is risk focussed with preventative maintenance and inspection frequencies based on history of asset type, service duty and failures, articulation of the strategy could be strengthened, and consideration given to assessing the optimum blend of reactive, preventative maintenance and renewals activities.

- O&M plans - network risks are not strongly linked back to the broader asset management objectives and tend to have a focus on safety reflecting the focus of the applicable technical standards.

- Maintenance execution – no formal FMEA undertaken. Network risks are focussed on safety issues associated with network integrity and not strongly linked back to the broader asset management objectives. Six network emergency response plans developed, six to still be developed.
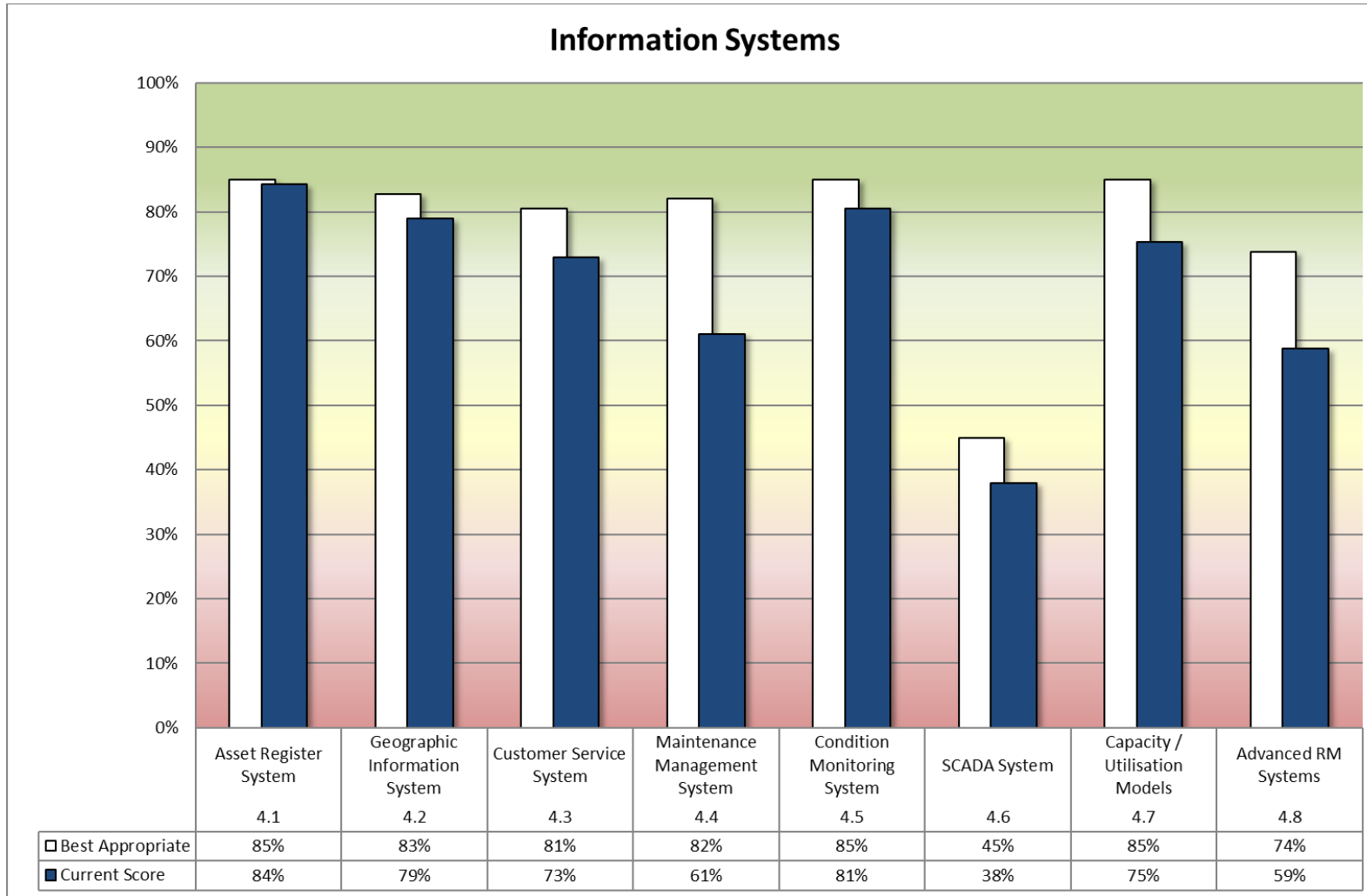
Information Systems

Information Systems

	Asset Register System	Geographic Information System	Customer Service System	Maintenance Management System	Condition Monitoring System	SCADA System	Capacity / Utilisation Models	Advanced RM Systems
	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8
☐ Best Appropriate	85%	83%	81%	82%	85%	45%	85%	74%
■ Current Score	84%	79%	73%	61%	81%	38%	75%	59%

Figure 42   Information systems – GasNet

The systems configured and used by GasNet are largely best appropriate for the organisation, and we note that GasNet is currently exploring options to establish a stronger asset management information system which would address many of the gaps identified.

Gaps in the elements reflect:

- Asset register – ArcGIS is currently used as the main asset register, with some integration between this and MIDaS and the IntraMaps viewer application which provides access to location and attribute and status information to all personnel. No further integration with other systems.

- GIS – interfacing issues as noted above.

- Customer service system – no integration between the asset register and FieldGO, with associated limitations with recording the data against the assets.

- Maintenance management system – FieldGO not integrated with the main asset database as above. Establishment of a new asset management information system would be expected to address these issues.

- Condition monitoring system – limitations to the use of the condition data within an unintegrated system.

- SCADA – not integrated with other systems, such as the MMS.

- Capacity/utilisation models – although Synergi is the industry accepted system, development of the models is not yet complete.

- Advanced RM system – risk manager used, but no links through to the asset register or other systems.
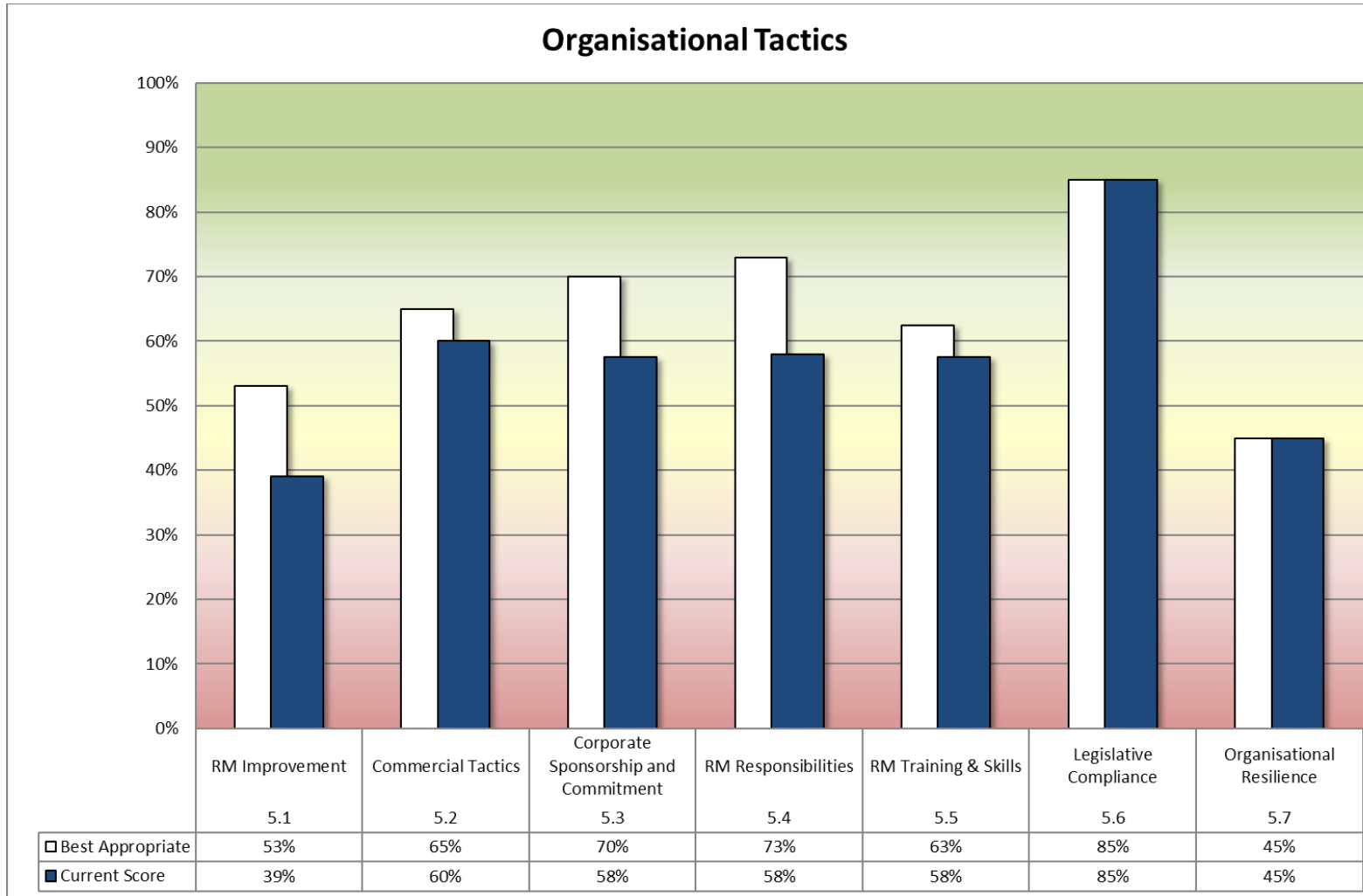
Organisational Tactics

	RM Improvement	Commercial Tactics	Corporate Sponsorship and Commitment	RM Responsibilities	RM Training & Skills	Legislative Compliance	Organisational Resilience
	5.1	5.2	5.3	5.4	5.5	5.6	5.7
☐ Best Appropriate	53%	65%	70%	73%	63%	85%	45%
■ Current Score	39%	60%	58%	58%	58%	85%	45%

Figure 43 Organisational tactics – GasNet

GasNet has strong legislative compliance processes in place, which are at a level we consider to be best appropriate. We believe that GasNet is on the way to establishing its practices at a level which demonstrates sound corporate commitment to asset management and risk management, although being a small organisation means that there is heavy reliance on a limited number of key individuals.

Gaps in the remaining elements reflect:

- RM improvement – no development of a systematic and detailed improvement plan to enable regular progress reviews. No programme of formalised benchmarking in place. Self-assessment of AM maturity is undertaken using the AMMAT tool which could be externally verified periodically. The assessment undertaken for this report can be used to compare organisations at a more detailed level.

- Commercial tactics – processes to ensure that risks associated with outsourced activities are managed in accordance with GasNet risk processes could be strengthened.

- Corporate sponsorship and commitment – adequate support for strengthening risk management, although being a small organisation results on reliance on a small number of key individuals. No formal risk management plan document in place.

- RM responsibilities – a systematic competency framework would strengthen this element.

- RM training and skills - a systematic competency framework would strengthen this element.

4.0   Conclusions

4.1   Overall Conclusions

This assessment has found that the GPBs are approaching a best appropriate level of risk management based on the size and nature of the specific organisations, the services they provide, and the size and nature of the infrastructure that enables these services to be delivered. Many processes were at a best appropriate level already, and the GPBs have already identified and commenced many of the improvement activities required to achieve best appropriate practice in the remaining areas. This reflects the ongoing development nature of asset management.

The absolute achievement of zero gaps should not be slavishly followed. An assessment framework such as this provides a systematic and repeatable basis for evaluating the appropriateness of current practice, but the level of preciseness of scoring is not absolute.

Key gaps between current practice and best appropriate practice within each of the GPBs were largely consistent, reflecting the prescriptive nature of the technical standards that they are bound by[14], and the consistent regulatory requirements imposed on them. These gaps are, in order of significance:

4.1.1   Gaps of High Significance

- limited understanding of what security of supply risk external stakeholders consider acceptable and associated engagement with the stakeholders;

- although there is a reasonable understanding of infrastructure failure profiles and renewal needs in the first ten years, there is limited understanding of these aspects in the longer-term. and

- limited articulated understanding of distribution network resilience.

4.1.2   Gaps of Moderate Significance

- A slightly narrow focus to the network risk management. This reflects the adoption of technical standards with somewhat prescriptive risk management approaches. Although consequence impact areas rated include aspects beyond health and safety, the events themselves tend to have been identified within an overall network integrity/public safety context. Given that this complies with accepted standards, we cannot say that it is inadequate as such. However, we believe an approach which is tied clearly to the broader asset management objectives would strengthen the GPBs' risk management.

- Limited systematic optimisation[15] of activities addressing risks and/or drawing on risk principles which should consider impacts on external stakeholders and triple bottom line[16] aspects.

- No systematic criticality framework in place.

- Some systems are not integrated to exploit their ease of use and functionality.

- As is typical with owners of linear network assets, there remain some data gaps and inconsistencies. All GPBs understand this and have focussed and ongoing programmes to improve data quality. Provided these programmes continue we do not believe these gaps represent a significant risk.

- Although some work has been undertaken on understanding organisational resilience and preparedness, this is more of a risk-type approach. Use of a self-assessment tool, such as OrgRes, would enable a better understanding of the organisational resilience.

We believe that gaps remaining following the completion of the improvement activities currently underway should be reasonably straightforward to address.

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[14] Principally NZS 7901, AS/NZS 4645 and AS/NZS 2885
[15] Prioritisation and selection of the best option
[16] Social, environmental and economic aspects

4.1.3   Specific Industry Context Observations

The industry context referred to in Section 1.3 makes specific reference to the following four aspects. While these were not specifically assessed as such, we make the following observations:

- **Recent change in ownership of the transmission network**. First Gas recently inherited the networks, data, systems and risks from other organisations. They have worked to review these aspects and we believe have made excellent progress to understand the assets and data, to adopt best appropriate processes and systems, and to identify and manage risks. We believe that the quality of data is likely to have declined slightly as new systems have been established. However, we believe that this is being progressively addressed in a deliberate manner and, as such, does not represent a significant risk.

- **Recent government initiatives**. Zero Carbon Bill, establishment of a Climate Commission and ban on new offshore exploration rights will affect the way the GPBs manage their networks. All GPBs recognise this as a key driver, include these aspects within their corporate risk registers and are committed to the promotion of the continued use of gas as a viable energy source. In addition, both Vector and Powerco have commenced work to understand the impacts and opportunities for their networks from changing technologies. In broad terms, all assessed GPBs are continuing to manage their networks considering long-term service provision.

- **Proposed customised price-quality path (CPP)**. We believe First Gas understands the additional rigour required to successfully navigate the CPP requirements.

- **Resilience awareness**. While First Gas had a reasonable understanding of the remaining life of its transmission network and progressing its understanding of the network's resilience, the distribution businesses were less advanced with regards to high impact low probability (HILP) events. Although a range of impact areas are considered, distribution network risk processes tend to be driven by integrity aspects with a human safety focus, and resultant programmes of work address industry-wide issues such as pre-1985 polyethylene pipe material. No GPB has a good understanding if its organisational resilience, although Vector has developed specific strategies around organisational strengthening.

4.2   First Gas Transmission

4.2.1   Overview

First Gas Transmission (FGL-TR) is approaching the level of risk management we believe to be best appropriate for such an organisation. We consider the current rating is commendable considering:

- the organisation is very new, and has needed to implement changes to systems and approaches established by the previous networks owner to reflect the size of FGL and the relevant networks; and

- there is clear evidence of ongoing improvement activities.

We were impressed by the demonstrated use of systems and risk principles to drive actions. We were also impressed with the clear evidence throughout the FGL offices that risk was a high priority, and that there was a strong culture of continuous improvement.

4.2.2   Gap Analysis

We believe that many of the identified gaps will be addressed through current improvement activities and the remaining gaps should be reasonably straightforward to address. Key gaps are presented in Section 3.3.

4.2.3 Risk Aspects of Particular Importance

Key Aspect	Assessed in	Comment
Asset criticality	• Asset Knowledge - Risk Management Data • Strategic Planning Processes - Strategic Failure Prediction - Technical Failure Prediction • Asset Management Practices - O&M Strategy and Analysis - O&M Plans - Maintenance Execution • Information Systems - Advanced RM Systems	Strategic mains and high consequence areas are identified and these assets are managed more intensively. Criticality ratings are recorded in Maximo for all compressor stations at the station level. However: • Aspects considered when identifying critical assets are somewhat narrow; • Linkages to the established risk management frameworks are not clear; • Criticality ratings are not held within Maximo; • Means to systematically apply this across the organisation to ensure consistency could be strengthened.
Resilience	• Strategic Planning Processes - Risk Management Strategy • Asset Management Practices - O&M Plans • Organisational Tactics - Organisational Resilience	As described in the supplementary report "First Gas Transmission Pipelines, Geohazard Risk Management Review" (AECOM September 2019)., the transmission network is subject to known geotechnical hazards. There have been only two significant pipeline failures attributed to geotechnical issues since construction in the 1970's and 1980's: • the Kapuni pipeline failed and caught fire near Gilbert Stream (Pukearuhe Road, north Taranaki) in July 1977 where the pipeline crossed the corner of a landslide. • in October 2011 a gas leak on the Maui pipeline occurred at Pukearuhe (North Taranaki) as a result of pipe damage caused by land movement. The most recent significant geohazard affecting the Maui pipeline was identified by an in-line inspection in 2018 that identified a buckle in the pipeline at Pariroa, about 9.3 km south from the Mokau Compressor Station and close to a previously identified pipeline strain site at an active landslide. Work is underway to identify vulnerable areas and define implications to the network, particularly with regards to geotechnical risk. When complete, this will enable a systematic and formal articulation of network resilience profile. Although some work has been undertaken on understanding organisational resilience and preparedness, this is more of a risk-type approach. Use of a self-assessment

Key Aspect	Assessed in	Comment
		tool, such as OrgRes, would enable a better understanding of this aspect.
Cost benefit analysis	• Strategic Planning Processes 　- Renewals Planning 　- Risk Management Strategy 　- Risk Management Decision-Making • Asset Management Practices 　- O&M Strategy and Analysis 　- O&M Plans 　- Maintenance Execution	Cost benefit analysis is routinely used within risk-based decision making. However broader social, environmental and financial aspects are not consistently considered and/or applied across the organisation Specific optimisation of risk treatment options is currently a manual process.
Asset data accuracy	• Asset Knowledge 　- All elements	We consider that asset data completeness and accuracy is at an acceptable level noting specifically that there is a deliberate and ongoing focus on data review and improvement.
Customer expectations	• Strategic Planning Processes 　- Risk Management Consultation	Although stakeholders are identified, and work has been undertaken to understand what security of supply risk they consider acceptable, this is not quantified and does not include consideration of their "willingness-to-pay".

4.3   First Gas Distribution

4.3.1   Overview

First Gas Transmission (FGL-DTR) is approaching the level of risk management we believe to be best appropriate for such an organisation. We consider the current rating is commendable considering:

- the organisation is very new, and has needed to implement changes to systems and approaches established by the previous networks owner to reflect the size of FGL and the relevant networks; and

- there is clear evidence of ongoing improvement activities.

We were impressed with the clear evidence throughout the FGL offices that risk was a high priority, and that there was a good culture of continuous improvement.

4.3.2   Gap Analysis

We believe that many of the identified gaps will be addressed through current improvement activities and the remaining gaps should be reasonably straightforward to address. Key gaps are presented in Section 3.4.

4.3.3   Risk Aspects of Particular Importance

Key Aspect	Assessed in	Comment
Asset criticality	- Asset Knowledge - Risk Management Data - Strategic Planning Processes - Strategic Failure Prediction - Technical Failure Prediction - Asset Management Practices - O&M Strategy and Analysis - O&M Plans - Maintenance Execution - Information Systems - Advanced RM Systems	Strategic mains (large) and high consequence areas (urbanised areas) are identified, and these assets are managed more intensively. However, comprehensive criticality ratings linked to the network risk management framework are not systematically applied to assets.
Resilience	- Strategic Planning Processes - Risk Management Strategy - Asset Management Practices - O&M Plans - Organisational Tactics - Organisational Resilience	Network risks tend to be focussed on materials and integrity aspects. There is no systematic and/or formal articulation of the network resilience profile. Although some work has been undertaken on understanding organisational resilience and preparedness, this is more of a risk-type approach. Use of a self-assessment tool, such as OrgRes, would enable a better understanding of this aspect
Cost benefit analysis	- Strategic Planning Processes - Renewals Planning - Risk Management Strategy - Risk Management Decision-Making - Asset Management Practices - O&M Strategy and Analysis - O&M Plans - Maintenance Execution	Cost benefit analysis is routinely used within risk-based decision making. However broader social, environmental and financial aspects are not consistently considered and/or applied across the organisation Specific optimisation of risk treatment options is currently a manual process.

Key Aspect	Assessed in	Comment
Asset data accuracy	• Asset Knowledge - All elements	We consider that asset data completeness and accuracy is at an acceptable level noting specifically that the deliberate and ongoing focus on data review and improvement needs to continue.
Customer expectations	• Strategic Planning Processes - Risk Management Consultation	Although stakeholders are identified, and work has been undertaken to understand what security of supply risk they consider acceptable, this is not quantified and does not include consideration of their "willingness-to-pay".

4.4   Vector

4.4.1   Overview

Vector is approaching the level of risk management we believe to be best appropriate for such an organisation with clear evidence that risk management is widely recognised as a core aspect of Vector's business. Vector's organisational structure, risk-specific role provision and broad consideration of risk (including organisational resilience) was identified as an aspect of particular strength.

4.4.2   Gap Analysis

We believe that many of the identified gaps will be addressed through current improvement activities and the remaining gaps should be reasonably straightforward to address. Key gaps are presented in Section 3.5.

4.4.3   Risk Aspects of Particular Importance

Key Aspect	Assessed in	Comment

Asset criticality	• Asset Knowledge
	  - Risk Management Data
	• Strategic Planning Processes
	  - Strategic Failure Prediction
	  - Technical Failure Prediction
	• Asset Management Practices
	  - O&M Strategy and Analysis
	  - O&M Plans
	  - Maintenance Execution
	• Information Systems
	  - Advanced RM Systems
		Assets with high numbers of customer connections are considered critical, and these assets are managed more intensively. However, comprehensive criticality ratings linked to the network risk management framework are not systematically applied to assets.
		
		Work currently underway to develop a condition-based asset risk model is expected to strengthen this area.

Resilience	• Strategic Planning Processes
	  - Risk Management Strategy
	• Asset Management Practices
	  - O&M Plans
	• Organisational Tactics
	  - Organisational Resilience
		There are opportunities to strengthen the presentation of business and network risk/resilience profile.
		
		Although work has been undertaken to understand organisational resilience and preparedness, and strategies developed, use of a self-assessment tool, such as OrgRes, would strengthen this aspect.

Cost benefit analysis	• Strategic Planning Processes
	  - Renewals Planning
	  - Risk Management Strategy
	  - Risk Management Decision-Making
	• Asset Management Practices
	  - O&M Strategy and Analysis
	  - O&M Plans
	  - Maintenance Execution
		Cost benefit analysis is routinely used within risk-based decision making. However broader social, environmental and financial aspects are not consistently considered and/or applied across the organisation.
		
		Specific optimisation of risk treatment options is currently a manual process.
		
		Work currently underway to develop a condition-based asset risk model is expected to strengthen this area

Key Aspect	Assessed in	Comment
Asset data accuracy	• Asset Knowledge - All elements	We consider that asset data completeness and accuracy is at an acceptable level noting specifically that there is a deliberate and ongoing focus on data review and improvement.
Customer expectations	• Strategic Planning Processes - Risk Management Consultation	Although stakeholders are identified, very little has been done in engaging these groups to understand what security of supply risk they consider acceptable, and their "willingness-to-pay".

4.5 Powerco

4.5.1 Overview

Powerco is approaching the level of risk management we believe to be best appropriate for such an organisation with clear evidence of ongoing improvement activities, including the ongoing work to introduce significant systems (such as SAP) and tools (such as Copperleaf) to improve integration and systemise optimisation efforts for organisational consistency. Powerco's demand modelling was identified as an aspect of particular strength.

4.5.2 Gap Analysis

We believe that many of the identified gaps will be addressed through current improvement activities and the remaining gaps should be reasonably straightforward to address. Key gaps are presented in Section 3.6.

4.5.3 Risk Aspects of Particular Importance

Key Aspect	Assessed in	Comment
Asset criticality	- Asset Knowledge - Risk Management Data - Strategic Planning Processes - Strategic Failure Prediction - Technical Failure Prediction - Asset Management Practices - O&M Strategy and Analysis - O&M Plans - Maintenance Execution - Information Systems - Advanced RM Systems	Strategic mains (large) and high consequence areas (urbanised areas) are identified, and these assets are managed more intensively. However, comprehensive criticality ratings linked to the network risk management framework are not systematically applied to assets. Powerco is planning to strengthen this aspect through its Asset health Indicators and Asset Criticality improvement projects.
Resilience	- Strategic Planning Processes - Risk Management Strategy - Asset Management Practices - O&M Plans - Organisational Tactics - Organisational Resilience	Network risks tend to be focussed on materials and integrity aspects. There is no systematic and/or formal articulation of the network resilience profile. Although some work has been undertaken on understanding organisational resilience and preparedness, this is more of a risk-type approach. Use of a self-assessment tool, such as OrgRes, would enable a better understanding of this aspect.
Cost benefit analysis	- Strategic Planning Processes - Renewals Planning - Risk Management Strategy - Risk Management Decision-Making - Asset Management Practices - O&M Strategy and Analysis - O&M Plans - Maintenance Execution	Cost benefit analysis is routinely used within risk-based decision making. However broader social, environmental and financial aspects are not consistently considered and/or applied across the organisation. Specific optimisation of risk treatment options is currently a manual process. Work currently underway to establish Copperleaf is expected to significantly strengthen this area.

Key Aspect	Assessed in	Comment
Asset data accuracy	• Asset Knowledge - All elements	We consider that asset data completeness and accuracy is at an acceptable level noting specifically that the deliberate and ongoing focus on data review and improvement needs to continue, assisted by the establishment of SAP as the asset management information system.
Customer expectations	• Strategic Planning Processes - Risk Management Consultation	Stakeholders are identified, and work has been undertaken to engage these groups to understand what security of supply risk they consider acceptable, and their "willingness-to-pay". However, as none of the customers interviewed expressed dissatisfaction with supply levels, the concept of paying more to get a satisfactory level of supply was not tested. Providing current and future scenarios with costed options to the full sample data-set could strengthen this area.

4.6   GasNet

4.6.1   Overview

GasNet is approaching the level of risk management we believe to be best appropriate for such an organisation with clear evidence of ongoing improvement activities. This takes into account the smaller size of both the organisation, as well as the network and customer base. Being such a small organisation does place a heavy reliance on a few key individuals and we encourage GasNet to continue to document information, processes and procedures to mitigate the risk of loss of institutional knowledge.

4.6.2   Gap Analysis

Despite the relatively low scores and larger gaps in places, we believe that many of the identified gaps will be addressed through current improvement activities and the remaining gaps should be reasonably straightforward to address. Key gaps are presented in Section 3.7.

4.6.3   Risk Aspects of Particular Importance

Key Aspect	Assessed in	Comment

Asset criticality	• Asset Knowledge
	  - Risk Management Data
	• Strategic Planning Processes
	  - Strategic Failure Prediction
	  - Technical Failure Prediction
	• Asset Management Practices
	  - O&M Strategy and Analysis
	  - O&M Plans
	  - Maintenance Execution
	• Information Systems
	  - Advanced RM Systems
		Assets with high numbers of customer connections are considered critical, and these assets are managed more intensively. Network assets (mains) are rated against a criteria based on operating pressure and asset size. The rating is used to classify their strategic importance, which is then used as a basis for their safety management and overall supply management. However, comprehensive criticality ratings linked to the network risk management framework are not systematically applied to assets.

Resilience	• Strategic Planning Processes
	  - Risk Management Strategy
	• Asset Management Practices
	  - O&M Plans
	• Organisational Tactics
	  - Organisational Resilience
		Network risks tend to be focussed on materials and integrity aspects. There is no systematic and/or formal articulation of the network resilience profile.
		
		Although some work has been undertaken on understanding organisational resilience and preparedness, this is more of a risk-type approach. Use of a self-assessment tool, such as OrgRes, would enable a better understanding of this aspect

Cost benefit analysis	• Strategic Planning Processes
	  - Renewals Planning
	  - Risk Management Strategy
	  - Risk Management Decision-Making
	• Asset Management Practices
	  - O&M Strategy and Analysis
	  - O&M Plans
	  - Maintenance Execution
		Cost benefit analysis is used within decision making for significant projects, although:
		• This is not routinely used for risk-based decision making.
		• Broader social, environmental and financial aspects are not consistently considered and/or applied across the organisation.
		
		Specific optimisation of risk treatment options is currently a manual process.

Key Aspect	Assessed in	Comment
Asset data accuracy	• Asset Knowledge - All elements	We consider that asset data completeness and accuracy is approaching an acceptable level noting specifically that the deliberate and ongoing focus on data review and improvement needs to continue, assisted by the establishment of an appropriate asset management information system.
Customer expectations	• Strategic Planning Processes - Risk Management Consultation	Although stakeholders are identified, very little has been done in engaging these groups to understand what security of supply risk they consider acceptable, and their "willingness-to-pay";

5.0   Recommendations

1. **Develop improvement plans.** This review identifies gaps between current practice and our assessment of best appropriate practice for each of the organisations. We recommend each of the organisations develop a detailed, resourced and prioritised improvement plan to close these identified gaps. This could be undertaken within the Asset Management Plans.

2. **Confirm appropriate level**. There is a correlation between sophistication of approach and cost and effort to accomplish this. We therefore consider that the "best appropriate" level should be confirmed by each GPB by quantifying the costs involved in closing the identified gaps and considering these costs against the benefits and/or risks of not doing so.

3. **Routine reporting against improvement plans**. We recommend routine reporting of asset and risk management improvement plan progress to provide the Commission with confidence that the GPBs actually undertake the improvements they have said they will. This could be undertaken within the Asset Management Plans.

4. **Consider supplementary assessments**. This assessment is limited to the processes and practices, the underlying data and systems, and the overarching corporate commitment. It does not assess actual performance, outputs and outcomes. We recommend that performance benchmarking is considered to supplement the outcomes of this assessment and the routine regulatory reporting requirements[17].

5. **Consider re-assessment**. The GPBs could be reassessed using this framework, or a rolled-up version of it in three years' time. We consider three years is a reasonable timeframe to achieve the improvements required to close most, if not all of the identified gaps to a level where the Commission should have confidence the processes, underlying data and systems, and overarching corporate commitment are at a best appropriate level.

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[17] Similar to water sector benchmarking undertaken by Water New Zealand and Water Services Association of New Zealand

6.0   Standard Limitations

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Appendix A

Assessment Details
First Gas Transmission

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.1	Asset Categorisation	1.1.1	Asset register data established to a defined and documented hierarchy / structure.	4.00	5.00	3%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.2	Components are broken down an appropriate AM level e.g. maintenance managed item (MMI).	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.3	Asset data can easily be queried and grouped based on asset hiearchy / structure.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.4	Unique asset ID is used consistently throughout organisation / systems.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.5	Data is complete and accurate	4.00	5.00	3%
1	Asset Knowledge	1.2	Location Data	1.2.1	Asset register contains descriptive location information that further supports the locating of assets.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.2	Assets are represented spatially in GIS, level information (Z co-ordinates) recorded in asset register.	4.00	5.00	4%
1	Asset Knowledge	1.2	Location Data	1.2.3	Location information recorded for all assets in as-built drawings which are produced to a defined standard.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.4	Documented processes in place to routinely update / improve location data.	5.00	6.00	3%
1	Asset Knowledge	1.2	Location Data	1.2.5	Data is complete and accurate	5.00	6.00	3%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.1	Asset register contains key dimensions for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.2	Asset register contains material type for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.3	Attribute information recorded to sufficient detail for AM purposes.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.4	Attribute information is populated from accurate records or inspections.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.5	Source of attribute information is recorded	4.00	5.00	2%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.6	A documented process is in place and ensures the asset register is routinely updated / improved.	5.00	6.00	2%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.7	Data is complete and accurate	5.00	6.00	2%
1	Asset Knowledge	1.4	O & M Data	1.4.1	Planned maintenance schedules are recorded in maintenance management system.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.2	Failure history is recorded against the asset	3.00	5.00	8%
1	Asset Knowledge	1.4	O & M Data	1.4.3	O&M activities (work orders or work requests) are recorded against assets or facilities suitable for AM analysis and reporting.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.4	Customer service requests for unplanned maintenance are recorded and action tracked.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.5	Documented processes ensures O&M data or any asset changes resulting from O&M activities are recorded.	5.00	6.00	2%
1	Asset Knowledge	1.4	O & M Data	1.4.6	Data is complete and accurate	4.00	5.00	2%
1	Asset Knowledge	1.5	Condition Data	1.5.1	Condition grading at asset component level completed as appropriate to asset type / criticality.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.2	Condition grading completed by person/s with knowledge of type of assets being assessed.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.3	An industry recognised condition grading scale appropriate to type of assets being assessed is utilised.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.4	Historical and current condition grades recorded so that rate of deterioration can be tracked.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.5	Documented optimised processes are in place to capture, update and report on asset condition data and ensure consistent application.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.6	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.1	Asset capacity is recorded accurately.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.2	Utilisation level of assets measured at regular intervals and recorded.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.3	Quality of utilisation data reflects asset criticality.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.4	Historical information held to enable monitoring of trends.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.5	Documented processes are in place to capture, update and report on utilisation.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.1	Documented asset performance measures in place.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.2	Asset performance measured at least annually.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.3	Historical information held to enable monitoring of trends.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.4	Asset performance reported to asset managers.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.5	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.1	Accurate asset age recorded for all assets.	4.00	5.00	5%
1	Asset Knowledge	1.8	Asset Life Data	1.8.2	Processes in place and undertaken for recording the creation date of assets.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.3	Physical lives of assets assessed based on condition, capacity and performance information.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.4	Lives of asset from ODM process recorded in register.	4.00	5.00	2%
1	Asset Knowledge	1.8	Asset Life Data	1.8.5	Evidence of application of formal review of asset lives annually.	4.00	5.00	2%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.9	Risk Management Data	1.9.1	Risk rating held at asset or facility level (as appropriate to level of risk).	4.00	5.00	3%
1	Asset Knowledge	1.9	Risk Management Data	1.9.2	The agency identifies from data records, risks with a history of realisation.	4.00	5.00	2%
1	Asset Knowledge	1.9	Risk Management Data	1.9.3	Processes in place to update or maintain risk data.	5.00	5.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.4	Critical assets are identified and recorded including criticality ratings.	4.00	5.00	3%
1	Asset Knowledge	1.9	Risk Management Data	1.9.5	Risk mitigation actions and projects recorded against assets.	5.00	5.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.6	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.1	The agency captures full cost information against the asset, including acquisition costs, overhead costs, O & M costs, renewal costs and disposal costs	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.2	Cost data held for creation/acquisition, maintenance, and renewals are sufficient that analysts can determine the most appropriate long term life cycle cost approach for the assets concerned.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.3	Cost data held for social and environmental aspects, as well as financial aspects related to unexpected failures	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.4	Asset replacement values based on a database of recently completed works - must be appropriate for revaluation purposes.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.5	Asset maint/renewals/creation categories documented and consistent with valuation component level.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.6	Data is complete and accurate	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.1	Demand forecasts are based on latest district/growth planning forecasts of population growths and development areas.	5.00	5.00	0%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.2	Demand forecasts include assessment of all components that make up demand (e.g. demand influences, pricing, customer types, consumption trends, climate change, demand management initiatives and technology change).	4.00	5.00	4%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.3	The agency derives future demands using historical demand analysis and segmented usage patterns, as well as forecast changes to demand drivers.	4.00	5.00	4%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.4	Demand forecast scenarios are developed, confidence limits are analysed and associated risks are understood.	4.00	4.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.1	The agency determines the "nominal life" of a particular class of asset either on a risk based economic life or on industry standards.	5.00	5.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.2	Current asset capacity/ performance is assessed regularly and compared to demand forecasts to predict 'failure' time.	4.00	5.00	2%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.3	Current asset condition data and operating environment factors used to supplement nominal life calculations for 'failure time'.	4.00	5.00	3%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.4	Asset performance is assessed against target levels of service to predict 'failure time'.	4.00	5.00	3%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.5	The agency uses interview of maintenance personnel and operators to actively bring them into the capability planning and implementation process.	4.00	4.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.6	Failure prediction for critical assets is particularly robust.	4.00	5.00	3%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.1	The agency determines projected failure frequency for assets with a failure history from failure records or other available sources. The agency determines the projected failure frequency for assets without a failure history from condition assessment where justifiable, or by degradation (life cycle) modelling.	4.00	5.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.2	The agency has identified failure modes to a resolution facilitating replacement or rehabilitation decisions.	5.00	5.00	0%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.3	The agency has documented failure modes in failure mode libraries to facilitate future failure modes and effects analysis.	4.00	4.00	0%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.4	The organisation identifies the consequences of failure of its assets	4.00	5.00	2%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.5	The agency assesses the likelihood of failure of the degraded and critical assets.	4.00	5.00	2%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.6	The organisation determines the risk posed by a degraded and critical asset should it fail and a record is kept.	4.00	5.00	2%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.1	The agency renewal decision process is documented.	4.00	5.00	3%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.2	The agency has a program of end of economic life rehabilitation / replacement projects based on economic, social and environmental considerations (including physical, capacity and level of service risk).	4.00	5.00	3%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.3	The organisation uses generic class asset class or asset cohort deterioration models for determining future renewal	4.00	5.00	2%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.4	The organisation uses individual asset end of life projection based on degradation modelling and failure consequence	5.00	5.00	0%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.5	The organisation regularly monitors the condition and/or risk of an asset to update the priority and timing of assets to be renewed prior to failure.	5.00	5.00	0%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.6	The agency projects capital expenditure for asset replacement.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.1	Organisation-wide risk management framework developed, understood and established across the organisation. Framework consistent with ISO 31000. Common risk criteria are used for categorizing risk for all business units in the organization.	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.2	Risk thresholds developed with clear linkage to strategic goals, legislative requirements, stakeholder needs and industry practice	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.3	Corporate risk policy in place, clearly identifying corporate and other objectives against which risk will be assessed.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.4	The agency undertakes risk analysis to identify, quantify and document risk consistent with ISO 31000. The organisation considers internal and external risk and opportunities. Sound processes in place to determine internal and external issues relevant to organisation's purpose that can impact on its ability to achieve the intended outcomes of its AM system	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.5	Risks have been identified and are recorded at a level of detail appropriate to the risk exposure. Risks consider all phases of the asset lifecycle.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.6	The organisation has prepared a business risk profile, including a network risk and resilience profile.	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.7	Interdependencies (including interdependencies with other utilities) assessed in a systematic manner	3.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.8	The organisation actively participates in Lifelines groups	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.9	Risk mitigation is actively undertaken. Risk management strategies developed with clear actions linked to risk severity following ALARP principles where appropriate	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.10	Risk treatment options developed systematically with consideration of benefits and costs following ALARP principles where appropriate	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.11	Risk analysis includes ensuring that the agency is not "over-controlled" for the risks it faces	1.00	4.00	4%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.12	Risk analysis includes assessing the risk associated with failure of risk controls	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.13	The organisation has a formal and ongoing process for review of business context, risk identification and management. Procedures in place to update risk register and policy for those risks not previously identified, where impacts may change or where current or future changes in the organisations operating environment affect risk.	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.14	The organisation audits the risk management procedure for suitability and effectiveness.	2.00	4.00	2%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.1	Different stakeholder groups and expectations/needs identified, and reviewed regularly to identify new stakeholders and emerging/changing needs.	3.00	4.00	5%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.2	Risks and their management are regularly reported to all appropriate stakeholders. Specifically includes monitoring and reporting on changes to the risk profile and on risks that exceed a defined risk level	4.00	5.00	3%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.3	Risks including outage-related levels of service, reviewed regularly, involving stakeholder consultation and feedback. Stakeholder tolerances tested and confirmed	2.00	4.00	9%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.4	Risks including outage-related level of service reviews, include costed options and take account of customer 'willingness to pay'.	1.00	4.00	14%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.5	Customer input is sought to predict future changes in outage-related LOS from changing customer trends and legislative changes.	1.00	4.00	14%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.1	Risk integral to organisations decision-making.	4.00	5.00	4%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.2	Risk quantified on basis of likelihood and consequences for tangible and intangible risk. The agency assesses the consequences of failure on a triple bottom line basis. The consequences are assessed in terms of dollars or dollar equivalents so that risk can be treated as a cost in decision making.	4.00	5.00	3%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.4	Risk mitigation options (projects) to address all predicted risks over the specified thresholds have been identified.	5.00	5.00	0%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.5	Projects have been selected and prioritised based on lifecycle cost and TBL analysis consistently across all activity areas.	3.00	5.00	8%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.6	The agency includes stakeholder liaison for social, economic and environmental factors as part of the options analysis.	2.00	4.00	7%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
3	Asset Management Practices	3.1	Design Processes	3.1.1	Documented design/construction standards exist and are regularly updated considering TBL aspects and past performance with operator and maintainer input.	5.00	5.00	0%
3	Asset Management Practices	3.1	Design Processes	3.1.2	Documented design/construction standards are routinely used for asset design.	5.00	5.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.1	The organisation uses formal acceptance procedures to ensure that equipment is built physically according to specification.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.2	The organisation uses formal acceptance procedures to ensure that equipment performs to the functional specification.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.3	The organisation has acceptance procedures for the technical information package comprising: drawings; operating manuals; equipment/product lists and specifications; maintenance manuals; operational software listings; and costs.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.4	The agency provides necessary training to personnel managing, operating or maintaining the new or modified asset prior to acceptance of the asset.	4.00	4.00	0%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.1	O & M strategy is risk-focused and optimises reactive, preventative maintenance and renewals options.	4.00	5.00	6%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.2	Documented maintenance policies for assets covering both planned and unplanned activities that outline overall maintenance objectives and strategies.	5.00	5.00	0%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.3	Analysis to determine cause of failures and to prevent recurrence.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.1	Operations and maintenance procedures manuals are available for all plant and mechanical assets in appropriate form.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.2	Processes in place to ensure that the manuals are kept up to date.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.3	The agency has a quality procedure from the time of acceptance, that is implemented and followed ensuring change to asset configuration is managed throughout the utilisation phase of the asset life, such that at any given time the technical records are representative of the physical assets.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.4	The agency has effected an operational risk identification program and has documented the results.	4.00	5.00	2%
3	Asset Management Practices	3.4	O & M Plans	3.4.5	The agency has undertaken formal analysis on the basis of likelihood and consequence and the cost of managing the risk. This has resulted in a prioritised operational risk mitigation program.	4.00	5.00	2%
3	Asset Management Practices	3.4	O & M Plans	3.4.6	The agency addresses operational risks identified for action in a timely and controlled manner, either by implementation of physical changes or through operating procedural initiatives.	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.7	The organisation has a Safety Management System in accordance with NZS 7901:2014 and AS/NZS 2885.6:2018	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.8	Procedures in place for rapid and structured response to emergency failures. These procedures are regularly tested and reviewed. Maintenance plans have specific plans for critical events and critical asset failures.	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.9	The agency audits to ensure adequate treatment of risks, and to identify new operational risks.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.10	The organisation has a process or procedure that captures and integrates the outcomes of incidents or emergencies into the O&M Plans or RM Plans	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.11	Formal emergency response plans and business continuity plans developed and periodically tested and reviewed	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.1	The agency has an understanding of the principles of failure modes and effects analysis.	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.2	The agency has identified failure modes to a resolution suitable for the management of its maintenance	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.3	The agency records failure modes in failure mode libraries to facilitate future analysis.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.4	The agency has a risk analysis procedure quantifying maintenance and operations risk	4.00	5.00	2%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.5	The organisation calculates risk for each failure mode and a record is held against the asset or equipment. Risk is based on consequence for each failure mode and likelihood in terms of projected frequency of each failure mode, either from historical performance, published reliability data or from statistical or physical condition degradation models.	4.00	5.00	2%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
3	Asset Management Practices	3.5	Maintenance Execution	3.5.6	The agency identifies high consequence assets and these are considered for preventive maintenance	4.00	5.00	2%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.7	The organisation requires operators to develop failure contingency plans where for high consequence assets, preventive maintenance is considered unjustifiable because of low likelihood of failure.	3.00	4.00	3%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.8	The agency maintenance management strategy comprises a "roll up" of the maintenance targeting each failure mode.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.9	The agency has planned and unplanned maintenance procedures. These are readily available to maintenance personnel for both planned and unplanned situations.	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.10	The agency generates a record of maintenance task non-performance backlog by which "catch up" maintenance is managed.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.11	The agency regularly reviews records of maintenance task non performance and addresses these through strategy, management or workforce changes.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.12	The agency changes maintenance procedures as a result of root cause analysis of equipment failures to prevent recurrence.	4.00	4.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
4	Information Systems	4.1	Asset Register System	4.1.1	Asset register is flexible and allows definition and recording recording of all needed asset types and attributes.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.2	Asset register has suitable reporting capabilities available - can be third party or through use of BI tools etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.3	Asset register can be interfaced / integrated with other business systems e.g through use of API's and web services etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.4	Asset register is accessible (locally and remotely) and 'user friendly'.	4.00	5.00	2%
4	Information Systems	4.1	Asset Register System	4.1.5	Asset register supports changeable hierarchical definition of assets and data can be grouped at alternative levels.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.6	Uses an audit trail to track changes to asset data.	4.00	5.00	1%
4	Information Systems	4.1	Asset Register System	4.1.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.1	GIS holds appropriate spatial representation of assets.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.2	GIS is linked to asset register for access to underlying asset attribute data.	3.00	5.00	6%
4	Information Systems	4.2	Geographic Information System	4.2.3	GIS provides validation checks and tools to ensure data integrity is maintained between the GIS and asset register .	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.4	Plans and records in a suitable form, readily available, accessible and current.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.5	All new works recorded in system as 'asbuilts'.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.6	GIS is 'user-friendly' and readily accessible to all staff.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.1	System available to manage requests relating to complaints and observations by both public and staff with regard to the performance or failure of assets	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.2	System records all the necessary details relating to the service request including customer/staff contact details	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.3	System is linked to asset register and/or maintenance management system so that remedial works can be linked to assets	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.5	System can capture remedial works data for assets including costs, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.1	System available to manage work orders / work requests	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.2	System can capture historic cost data for assets, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.3	System can capture works data for assets, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.5	System is linked to asset register so that maintenance actitivity is directly linked to assets and supports the validation of asset attribute data.	3.00	6.00	11%
4	Information Systems	4.4	Maintenance Management System	4.4.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.1	System available to manage condition gradings and accommodates industry recognised condition grading scales appropriate for the variety of assets that need regular monitoring.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.2	System is linked to the asset register so that condition grades directly relate to assets.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.3	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.4	System can interface with or export data for use with other third party analytical software.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.1	SCADA system is used to monitor and control operations on the network.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.2	SCADA System is linked to other systems such as maintenance management.	1.00	5.00	17%
4	Information Systems	4.6	SCADA System	4.6.3	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.4	System can interface with or export data for use with other third party analytical software.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.1	Models available to determine timing of failure with respect to capacity.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.2	Models available to determine asset capacity.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.3	Models accurately represent assets.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.4	Models are user-friendly, robust and accessible.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.1	System allows the defintion and identification of failure events / modes.	4.00	4.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.2	System allows the defintion and identification of consequences of physical failure and failure to deliver LOS in point and $ terms.	4.00	5.00	2%
4	Information Systems	4.8	Advanced RM Systems	4.8.3	System allows the identification of probability of failure for each event / mode	4.00	4.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.4	System can calculate a risk score (rating) and risk cost for assets or facilities.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.5	System can rank assets in terms of criticality	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.6	System is user-friendly and accessible.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
5	Organisational Tactics	5.1	RM Improvement	5.1.1	Staff place high priority on completing RM improvements.	5.00	5.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.2	Process in place for regularly monitoring improvement plan progress.	5.00	5.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.3	Independent audits undertaken to identify improvements.	3.00	4.00	3%
5	Organisational Tactics	5.1	RM Improvement	5.1.4	Improvement plan updated annually.	4.00	4.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.5	RM improvements from last review/plan completed as per programme.	4.00	4.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.6	The utility undertakes routine self-assessment and formalized benchmarking to compare and continually improve its practice and performance.	2.00	4.00	9%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.1	The organisation undertakes an assessment determining whether it should hold spares and consumables in stock.	4.00	4.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.2	Organisation ensures that core network information is 'owned' and retained in-house.	5.00	5.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.3	Organisation assesses risks associated with outsourced activities and ensures that risks are identified, assessed and adequately controlled in keeping with its risk management framework	3.00	5.00	8%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.4	Formal quality system in place	3.00	4.00	5%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.1	Board and senior managers approve RM plan regularly (at least annually).	4.00	5.00	4%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.2	Board and senior managers consulted during RM plan development.	4.00	5.00	4%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.3	Adequate resources available for RM plan development. A sense of urgency exists within the organization to continue to establish and improve its level of practice around RM.	5.00	5.00	0%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.4	Corporate teams with appropriate RM skills, direction and staffing, working collaboratively across functions to deliver improvements in RM.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.1	RM roles and responsibilities clearly defined and documented in all organisational units (including documentation in Position Descriptions).	4.00	5.00	4%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.2	There is alignment and understanding at the senior level and agreement of roles/responsibilities and how they support each other.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.3	Planning in place to minimise risks relating to loss of key staff knowledge.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.4	Specified staff responsible for ensuring that procedures and documentation are up to date and reflect current practice and policies.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.5	Staff are informed & aware of risk procedures and policies and their own risk management responsibilities.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.6	Risk management plans are developed with input from staff at all levels of asset management processes.	4.00	5.00	4%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.1	Required RM competencies identified and organisational capability systematically assessed specifically identifying skill gaps.	3.00	4.00	8%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.2	Staff regularly attend workshops as appropriate to close skill gaps.	4.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.3	Knowledge sharing and exchange of personnel is used to foster RM principles and practices.	4.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.4	Level of RM expertise is appropriate to each job.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.2	Organisation monitors possible legislative changes or changes in standards that may have an impact on its operations or policies.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.1	Organisational and commercial tactics & RM strategy reviewed to incorporate changes in regulations and standards.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.3	Organisation informs staff of legislative changes affecting their work.	5.00	5.00	0%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.1	The organisation understands its organisational resilience through a structured assessment using industry-accepted frameworks/tools (e.g. OrgResTool)	3.00	4.00	10%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.2	The organisation has an organisational resilience strategy in place which is actively implemented	3.00	4.00	8%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.3	The organisational resilience strategy is regularly reviewed and progress monitored/reported as appropriate	3.00	4.00	8%

Appendix B

Assessment Details
First Gas Distribution

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.1	Asset Categorisation	1.1.1	Asset register data established to a defined and documented hierarchy / structure.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.2	Components are broken down an appropriate AM level e.g. maintenance managed item (MMI).	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.3	Asset data can easily be queried and grouped based on asset hierarchy / structure.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.4	Unique asset ID is used consistently throughout organisation / systems.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.5	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.1	Asset register contains descriptive location information that further supports the locating of assets.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.2	Assets are represented spatially in GIS, level information (Z co-ordinates) recorded in asset register.	4.00	5.00	4%
1	Asset Knowledge	1.2	Location Data	1.2.3	Location information recorded for all assets in as-built drawings which are produced to a defined standard.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.4	Documented processes in place to routinely update / improve location data.	5.00	6.00	3%
1	Asset Knowledge	1.2	Location Data	1.2.5	Data is complete and accurate	4.00	6.00	6%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.1	Asset register contains key dimensions for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.2	Asset register contains material type for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.3	Attribute information recorded to sufficient detail for AM purposes.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.4	Attribute information is populated from accurate records or inspections.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.5	Source of attribute information is recorded	4.00	5.00	2%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.6	A documented process is in place and ensures the asset register is routinely updated / improved.	5.00	6.00	2%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.7	Data is complete and accurate	5.00	6.00	2%
1	Asset Knowledge	1.4	O & M Data	1.4.1	Planned maintenance schedules are recorded in maintenance management system.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.2	Failure history is recorded against the asset	3.00	5.00	8%
1	Asset Knowledge	1.4	O & M Data	1.4.3	O&M activities (work orders or work requests) are recorded against assets or facilities suitable for AM analysis and reporting.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.4	Customer service requests for unplanned maintenance are recorded and action tracked.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.5	Documented processes ensures O&M data or any asset changes resulting from O&M activities are recorded.	5.00	6.00	2%
1	Asset Knowledge	1.4	O & M Data	1.4.6	Data is complete and accurate	4.00	5.00	2%
1	Asset Knowledge	1.5	Condition Data	1.5.1	Condition grading at asset component level completed as appropriate to asset type / criticality.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.2	Condition grading completed by person/s with knowledge of type of assets being assessed.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.3	An industry recognised condition grading scale appropriate to type of assets being assessed is utilised.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.4	Historical and current condition grades recorded so that rate of deterioration can be tracked.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.5	Documented optimised processes are in place to capture, update and report on asset condition data and ensure consistent application.	4.00	5.00	2%
1	Asset Knowledge	1.5	Condition Data	1.5.6	Data is complete and accurate	4.00	5.00	2%
1	Asset Knowledge	1.6	Capacity Data	1.6.1	Asset capacity is recorded accurately.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.2	Utilisation level of assets measured at regular intervals and recorded.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.3	Quality of utilisation data reflects asset criticality.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.4	Historical information held to enable monitoring of trends.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.5	Documented processes are in place to capture, update and report on utilisation.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.1	Documented asset performance measures in place.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.2	Asset performance measured at least annually.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.3	Historical information held to enable monitoring of trends.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.4	Asset performance reported to asset managers.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.5	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.1	Accurate asset age recorded for all assets.	4.00	5.00	5%
1	Asset Knowledge	1.8	Asset Life Data	1.8.2	Processes in place and undertaken for recording the creation date of assets.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.3	Physical lives of assets assessed based on condition, capacity and performance information.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.4	Lives of asset from ODM process recorded in register.	3.00	5.00	6%
1	Asset Knowledge	1.8	Asset Life Data	1.8.5	Evidence of application of formal review of asset lives annually.	3.00	5.00	4%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.9	Risk Management Data	1.9.1	Risk rating held at asset or facility level (as appropriate to level of risk).	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.2	The agency identifies from data records, risks with a history of realisation.	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.3	Processes in place to update or maintain risk data.	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.4	Critical assets are identified and recorded including criticality ratings.	3.00	4.00	5%
1	Asset Knowledge	1.9	Risk Management Data	1.9.5	Risk mitigation actions and projects recorded against assets.	3.00	4.00	4%
1	Asset Knowledge	1.9	Risk Management Data	1.9.6	Data is complete and accurate	4.00	4.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.1	The agency captures full cost information against the asset, including acquisition costs, overhead costs, O & M costs, renewal costs and disposal costs	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.2	Cost data held for creation/acquisition, maintenance, and renewals are sufficient that analysts can determine the most appropriate long term life cycle cost approach for the assets concerned.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.3	Cost data held for social and environmental aspects, as well as financial aspects related to unexpected failures	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.4	Asset replacement values based on a database of recently completed works - must be appropriate for revaluation purposes.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.5	Asset maint/renewals/creation categories documented and consistent with valuation component level.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.6	Data is complete and accurate	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.1	Demand forecasts are based on latest district/growth planning forecasts of population growths and development areas.	5.00	5.00	0%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.2	Demand forecasts include assessment of all components that make up demand (e.g. demand influences, pricing, customer types, consumption trends, climate change, demand management initiatives and technology change).	4.00	5.00	4%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.3	The agency derives future demands using historical demand analysis and segmented usage patterns, as well as forecast changes to demand drivers.	4.00	5.00	4%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.4	Demand forecast scenarios are developed, confidence limits are analysed and associated risks are understood.	4.00	4.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.1	The agency determines the "nominal life" of a particular class of asset either on a risk based economic life or on industry standards.	5.00	5.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.2	Current asset capacity/ performance is assessed regularly and compared to demand forecasts to predict 'failure' time.	4.00	5.00	2%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.3	Current asset condition data and operating environment factors used to supplement nominal life calculations for 'failure time'.	3.00	5.00	8%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.4	Asset performance is assessed against target levels of service to predict 'failure time'.	3.00	5.00	8%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.5	The agency uses interview of maintenance personnel and operators to actively bring them into the capability planning and implementation process.	4.00	4.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.6	Failure prediction for critical assets is particularly robust.	4.00	5.00	3%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.1	The agency determines projected failure frequency for assets with a failure history from failure records or other available sources. The agency determines the projected failure frequency for assets without a failure history from condition assessment where justifiable, or by degradation (life cycle) modelling.	4.00	5.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.2	The agency has identified failure modes to a resolution facilitating replacement or rehabilitation decisions.	4.00	5.00	3%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.3	The agency has documented failure modes in failure mode libraries to facilitate future failure modes and effects analysis.	4.00	4.00	0%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.4	The organisation identifies the consequences of failure of its assets	3.00	4.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.5	The agency assesses the likelihood of failure of the degraded and critical assets.	3.00	4.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.6	The organisation determines the risk posed by a degraded and critical asset should it fail and a record is kept.	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.1	The agency renewal decision process is documented.	4.00	5.00	3%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.2	The agency has a program of end of economic life rehabilitation / replacement projects based on economic, social and environmental considerations (including physical, capacity and level of service risk).	4.00	5.00	3%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.3	The organisation uses generic class asset class or asset cohort deterioration models for determining future renewal	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.4	The organisation uses individual asset end of life projection based on degradation modelling and failure consequence	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.5	The organisation regularly monitors the condition and/or risk of an asset to update the priority and timing of assets to be renewed prior to failure.	4.00	5.00	2%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.6	The agency projects capital expenditure for asset replacement.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.1	Organisation-wide risk management framework developed, understood and established across the organisation. Framework consistent with ISO 31000. Common risk criteria are used for categorizing risk for all business units in the organization.	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.2	Risk thresholds developed with clear linkage to strategic goals, legislative requirements, stakeholder needs and industry practice	5.00	5.00	0%

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2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.3	Corporate risk policy in place, clearly identifying corporate and other objectives against which risk will be assessed.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.4	The agency undertakes risk analysis to identify, quantify and document risk consistent with ISO 31000. The organisation considers internal and external risk and opportunities. Sound processes in place to determine internal and external issues relevant to organisation's purpose that can impact on its ability to achieve the intended outcomes of its AM system	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.5	Risks have been identified and are recorded at a level of detail appropriate to the risk exposure. Risks consider all phases of the asset lifecycle.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.6	The organisation has prepared a business risk profile, including a network risk and resilience profile.	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.7	Interdependencies (including interdependencies with other utilities) assessed in a systematic manner	3.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.8	The organisation actively participates in Lifelines groups	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.9	Risk mitigation is actively undertaken. Risk management strategies developed with clear actions linked to risk severity following ALARP principles where appropriate	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.10	Risk treatment options developed systematically with consideration of benefits and costs following ALARP principles where appropriate	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.11	Risk analysis includes ensuring that the agency is not "over-controlled" for the risks it faces	1.00	4.00	4%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.12	Risk analysis includes assessing the risk associated with failure of risk controls	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.13	The organisation has a formal and ongoing process for review of business context, risk identification and management. Procedures in place to update risk register and policy for those risks not previously identified, where impacts may change or where current or future changes in the organisations operating environment affect risk.	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.14	The organisation audits the risk management procedure for suitability and effectiveness.	3.00	4.00	1%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.1	Different stakeholder groups and expectations/needs identified, and reviewed regularly to identify new stakeholders and emerging/changing needs.	3.00	4.00	5%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.2	Risks and their management are regularly reported to all appropriate stakeholders. Specifically includes monitoring and reporting on changes to the risk profile and on risks that exceed a defined risk level	4.00	5.00	3%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.3	Risks including outage-related levels of service, reviewed regularly, involving stakeholder consultation and feedback. Stakeholder tolerances tested and confirmed	2.00	4.00	9%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.4	Risks including outage-related level of service reviews, include costed options and take account of customer 'willingness to pay'.	1.00	4.00	14%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.5	Customer input is sought to predict future changes in outage-related LOS from changing customer trends and legislative changes.	1.00	4.00	14%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.1	Risk integral to organisations decision-making.	4.00	5.00	4%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.2	Risk quantified on basis of likelihood and consequences for tangible and intangible risk. The agency assesses the consequences of failure on a triple bottom line basis. The consequences are assessed in terms of dollars or dollar equivalents so that risk can be treated as a cost in decision making.	4.00	5.00	3%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.4	Risk mitigation options (projects) to address all predicted risks over the specified thresholds have been identified.	5.00	5.00	0%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.5	Projects have been selected and prioritised based on lifecycle cost and TBL analysis consistently across all activity areas.	3.00	5.00	8%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.6	The agency includes stakeholder liaison for social, economic and environmental factors as part of the options analysis.	2.00	4.00	7%
3	Asset Management Practices	3.1	Design Processes	3.1.1	Documented design/construction standards exist and are regularly updated considering TBL aspects and past performance with operator and maintainer input.	5.00	5.00	0%

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3	Asset Management Practices	3.1	Design Processes	3.1.2	Documented design/construction standards are routinely used for asset design.	5.00	5.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.1	The organisation uses formal acceptance procedures to ensure that equipment is built physically according to specification.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.2	The organisation uses formal acceptance procedures to ensure that equipment performs to the functional specification.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.3	The organisation has acceptance procedures for the technical information package comprising: drawings; operating manuals; equipment/product lists and specifications; maintenance manuals; operational software listings; and costs.	3.00	4.00	6%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.4	The agency provides necessary training to personnel managing, operating or maintaining the new or modified asset prior to acceptance of the asset.	4.00	4.00	0%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.1	O & M strategy is risk-focused and optimises reactive, preventative maintenance and renewals options.	3.00	4.00	10%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.2	Documented maintenance policies for assets covering both planned and unplanned activities that outline overall maintenance objectives and strategies.	4.00	5.00	5%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.3	Analysis to determine cause of failures and to prevent recurrence.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.1	Operations and maintenance procedures manuals are available for all plant and mechanical assets in appropriate form.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.2	Processes in place to ensure that the manuals are kept up to date.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.3	The agency has a quality procedure from the time of acceptance, that is implemented and followed ensuring change to asset configuration is managed throughout the utilisation phase of the asset life, such that at any given time the technical records are representative of the physical assets.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.4	The agency has effected an operational risk identification program and has documented the results.	4.00	5.00	2%
3	Asset Management Practices	3.4	O & M Plans	3.4.5	The agency has undertaken formal analysis on the basis of likelihood and consequence and the cost of managing the risk. This has resulted in a prioritised operational risk mitigation program.	4.00	5.00	2%
3	Asset Management Practices	3.4	O & M Plans	3.4.6	The agency addresses operational risks identified for action in a timely and controlled manner, either by implementation of physical changes or through operating procedural initiatives.	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.7	The organisation has a Safety Management System in accordance with NZS 7901:2014 and AS/NZS 2885.6:2018	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.8	Procedures in place for rapid and structured response to emergency failures. These procedures are regularly tested and reviewed. Maintenance plans have specific plans for critical events and critical asset failures.	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.9	The agency audits to ensure adequate treatment of risks, and to identify new operational risks.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.10	The organisation has a process or procedure that captures and integrates the outcomes of incidents or emergencies into the O&M Plans or RM Plans	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.11	Formal emergency response plans and business continuity plans developed and periodically tested and reviewed	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.1	The agency has an understanding of the principles of failure modes and effects analysis.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.2	The agency has identified failure modes to a resolution suitable for the management of its maintenance	3.00	4.00	3%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.3	The agency records failure modes in failure mode libraries to facilitate future analysis.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.4	The agency has a risk analysis procedure quantifying maintenance and operations risk	4.00	5.00	2%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.5	The organisation calculates risk for each failure mode and a record is held against the asset or equipment. Risk is based on consequence for each failure mode and likelihood in terms of projected frequency of each failure mode, either from historical performance, published reliability data or from statistical or physical condition degradation models.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.6	The agency identifies high consequence assets and these are considered for preventive maintenance	4.00	5.00	2%

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3	Asset Management Practices	3.5	Maintenance Execution	3.5.7	The organisation requires operators to develop failure contingency plans where for high consequence assets, preventive maintenance is considered unjustifiable because of low likelihood of failure.	3.00	4.00	3%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.8	The agency maintenance management strategy comprises a "roll up" of the maintenance targeting each failure mode.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.9	The agency has planned and unplanned maintenance procedures. These are readily available to maintenance personnel for both planned and unplanned situations.	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.10	The agency generates a record of maintenance task non-performance backlog by which "catch up" maintenance is managed.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.11	The agency regularly reviews records of maintenance task non performance and addresses these through strategy, management or workforce changes.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.12	The agency changes maintenance procedures as a result of root cause analysis of equipment failures to prevent recurrence.	3.00	3.00	0%

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4	Information Systems	4.1	Asset Register System	4.1.1	Asset register is flexible and allows definition and recording recording of all needed asset types and attributes.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.2	Asset register has suitable reporting capabilities available - can be third party or through use of BI tools etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.3	Asset register can be interfaced / integrated with other business systems e.g through use of API's and web services etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.4	Asset register is accessible (locally and remotely) and 'user friendly'.	4.00	5.00	2%
4	Information Systems	4.1	Asset Register System	4.1.5	Asset register supports changeable hierarchical definition of assets and data can be grouped at alternative levels.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.6	Uses an audit trail to track changes to asset data.	4.00	5.00	1%
4	Information Systems	4.1	Asset Register System	4.1.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.1	GIS holds appropriate spatial representation of assets.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.2	GIS is linked to asset register for access to underlying asset attribute data.	3.00	5.00	6%
4	Information Systems	4.2	Geographic Information System	4.2.3	GIS provides validation checks and tools to ensure data integrity is maintained between the GIS and asset register .	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.4	Plans and records in a suitable form, readily available, accessible and current.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.5	All new works recorded in system as 'asbuilts'.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.6	GIS is 'user-friendly' and readily accessible to all staff.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.1	System available to manage requests relating to complaints and observations by both public and staff with regard to the performance or failure of assets	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.2	System records all the necessary details relating to the service request including customer/staff contact details	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.3	System is linked to asset register and/or maintenance management system so that remedial works can be linked to assets	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.5	System can capture remedial works data for assets including costs, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.1	System available to manage work orders / work requests	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.2	System can capture historic cost data for assets, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.3	System can capture works data for assets, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.5	System is linked to asset register so that maintenance actitivity is directly linked to assets and supports the validation of asset attribute data.	3.00	6.00	11%
4	Information Systems	4.4	Maintenance Management System	4.4.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.1	System available to manage condition gradings and accommodates industry recognised condition grading scales appropriate for the variety of assets that need regular monitoring.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.2	System is linked to the asset register so that condition grades directly relate to assets.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.3	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.4	System can interface with or export data for use with other third party analytical software.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.1	SCADA system is used to monitor and control operations on the network.	2.00	3.00	6%
4	Information Systems	4.6	SCADA System	4.6.2	SCADA System is linked to other systems such as maintenance management.	1.00	3.00	9%
4	Information Systems	4.6	SCADA System	4.6.3	System is user-friendly and accessible to staff and contractors as required.	2.00	3.00	2%
4	Information Systems	4.6	SCADA System	4.6.4	System can interface with or export data for use with other third party analytical software.	2.00	3.00	3%
4	Information Systems	4.6	SCADA System	4.6.5	Staff use system and system functionality as appropriate for their role.	2.00	3.00	5%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.1	Models available to determine timing of failure with respect to capacity.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.2	Models available to determine asset capacity.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.3	Models accurately represent assets.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.4	Models are user-friendly, robust and accessible.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.1	System allows the defintion and identification of failure events / modes.	4.00	4.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.2	System allows the defintion and identification of consequences of physical failure and failure to deliver LOS in point and $ terms.	4.00	5.00	2%
4	Information Systems	4.8	Advanced RM Systems	4.8.3	System allows the identification of probability of failure for each event / mode	4.00	4.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.4	System can calculate a risk score (rating) and risk cost for assets or facilities.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.5	System can rank assets in terms of criticality	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.6	System is user-friendly and accessible.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
5	Organisational Tactics	5.1	RM Improvement	5.1.1	Staff place high priority on completing RM improvements.	5.00	5.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.2	Process in place for regularly monitoring improvement plan progress.	5.00	5.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.3	Independent audits undertaken to identify improvements.	3.00	4.00	3%
5	Organisational Tactics	5.1	RM Improvement	5.1.4	Improvement plan updated annually.	4.00	4.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.5	RM improvements from last review/plan completed as per programme.	4.00	4.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.6	The utility undertakes routine self-assessment and formalized benchmarking to compare and continually improve its practice and performance.	2.00	4.00	9%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.1	The organisation undertakes an assessment determining whether it should hold spares and consumables in stock.	4.00	4.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.2	Organisation ensures that core network information is 'owned' and retained in-house.	5.00	5.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.3	Organisation assesses risks associated with outsourced activities and ensures that risks are identified, assessed and adequately controlled in keeping with its risk management framework	3.00	5.00	8%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.4	Formal quality system in place	3.00	4.00	5%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.1	Board and senior managers approve RM plan regularly (at least annually).	4.00	5.00	4%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.2	Board and senior managers consulted during RM plan development.	4.00	5.00	4%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.3	Adequate resources available for RM plan development. A sense of urgency exists within the organization to continue to establish and improve its level of practice around RM.	5.00	5.00	0%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.4	Corporate teams with appropriate RM skills, direction and staffing, working collaboratively across functions to deliver improvements in RM.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.1	RM roles and responsibilities clearly defined and documented in all organisational units (including documentation in Position Descriptions).	4.00	5.00	4%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.2	There is alignment and understanding at the senior level and agreement of roles/responsibilities and how they support each other.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.3	Planning in place to minimise risks relating to loss of key staff knowledge.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.4	Specified staff responsible for ensuring that procedures and documentation are up to date and reflect current practice and policies.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.5	Staff are informed & aware of risk procedures and policies and their own risk management responsibilities.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.6	Risk management plans are developed with input from staff at all levels of asset management processes.	4.00	5.00	4%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.1	Required RM competencies identified and organisational capability systematically assessed specifically identifying skill gaps.	3.00	4.00	8%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.2	Staff regularly attend workshops as appropriate to close skill gaps.	4.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.3	Knowledge sharing and exchange of personnel is used to foster RM principles and practices.	4.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.4	Level of RM expertise is appropriate to each job.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.2	Organisation monitors possible legislative changes or changes in standards that may have an impact on its operations or policies.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.1	Organisational and commercial tactics & RM strategy reviewed to incorporate changes in regulations and standards.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.3	Organisation informs staff of legislative changes affecting their work.	5.00	5.00	0%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.1	The organisation understands its organisational resilience through a structured assessment using industry-accepted frameworks/tools (e.g. OrgResTool)	3.00	4.00	10%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.2	The organisation has an organisational resilience strategy in place which is actively implemented	3.00	4.00	8%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.3	The organisational resilience strategy is regularly reviewed and progress monitored/reported as appropriate	3.00	4.00	8%

Appendix C

Assessment Details Vector

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.1	Asset Categorisation	1.1.1	Asset register data established to a defined and documented hierarchy / structure.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.2	Components are broken down an appropriate AM level e.g. maintenance managed item (MMI).	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.3	Asset data can easily be queried and grouped based on asset hierarchy / structure.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.4	Unique asset ID is used consistently throughout organisation / systems.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.5	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.1	Asset register contains descriptive location information that further supports the locating of assets.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.2	Assets are represented spatially in GIS, level information (Z co-ordinates) recorded in asset register.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.3	Location information recorded for all assets in as-built drawings which are produced to a defined standard.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.4	Documented processes in place to routinely update / improve location data.	5.00	6.00	3%
1	Asset Knowledge	1.2	Location Data	1.2.5	Data is complete and accurate	5.00	6.00	3%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.1	Asset register contains key dimensions for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.2	Asset register contains material type for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.3	Attribute information recorded to sufficient detail for AM purposes.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.4	Attribute information is populated from accurate records or inspections.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.5	Source of attribute information is recorded	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.6	A documented process is in place and ensures the asset register is routinely updated / improved.	5.00	6.00	2%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.7	Data is complete and accurate	5.00	6.00	2%
1	Asset Knowledge	1.4	O & M Data	1.4.1	Planned maintenance schedules are recorded in maintenance management system.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.2	Failure history is recorded against the asset	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.3	O&M activities (work orders or work requests) are recorded against assets or facilities suitable for AM analysis and reporting.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.4	Customer service requests for unplanned maintenance are recorded and action tracked.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.5	Documented processes ensures O&M data or any asset changes resulting from O&M activities are recorded.	5.00	6.00	2%
1	Asset Knowledge	1.4	O & M Data	1.4.6	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.1	Condition grading at asset component level completed as appropriate to asset type / criticality.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.2	Condition grading completed by person/s with knowledge of type of assets being assessed.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.3	An industry recognised condition grading scale appropriate to type of assets being assessed is utilised.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.4	Historical and current condition grades recorded so that rate of deterioration can be tracked.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.5	Documented optimised processes are in place to capture, update and report on asset condition data and ensure consistent application.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.6	Data is complete and accurate	4.00	5.00	2%
1	Asset Knowledge	1.6	Capacity Data	1.6.1	Asset capacity is recorded accurately.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.2	Utilisation level of assets measured at regular intervals and recorded.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.3	Quality of utilisation data reflects asset criticality.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.4	Historical information held to enable monitoring of trends.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.5	Documented processes are in place to capture, update and report on utilisation.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.1	Documented asset performance measures in place.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.2	Asset performance measured at least annually.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.3	Historical information held to enable monitoring of trends.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.4	Asset performance reported to asset managers.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.5	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.1	Accurate asset age recorded for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.2	Processes in place and undertaken for recording the creation date of assets.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.3	Physical lives of assets assessed based on condition, capacity and performance information.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.4	Lives of asset from ODM process recorded in register.	4.00	5.00	2%
1	Asset Knowledge	1.8	Asset Life Data	1.8.5	Evidence of application of formal review of asset lives annually.	4.00	5.00	2%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.9	Risk Management Data	1.9.1	Risk rating held at asset or facility level (as appropriate to level of risk).	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.2	The agency identifies from data records, risks with a history of realisation.	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.3	Processes in place to update or maintain risk data.	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.4	Critical assets are identified and recorded including criticality ratings.	3.00	4.00	5%
1	Asset Knowledge	1.9	Risk Management Data	1.9.5	Risk mitigation actions and projects recorded against assets.	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.6	Data is complete and accurate	4.00	4.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.1	The agency captures full cost information against the asset, including acquisition costs, overhead costs, O & M costs, renewal costs and disposal costs	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.2	Cost data held for creation/acquisition, maintenance, and renewals are sufficient that analysts can determine the most appropriate long term life cycle cost approach for the assets concerned.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.3	Cost data held for social and environmental aspects, as well as financial aspects related to unexpected failures	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.4	Asset replacement values based on a database of recently completed works - must be appropriate for revaluation purposes.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.5	Asset maint/renewals/creation categories documented and consistent with valuation component level.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.6	Data is complete and accurate	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.1	Demand forecasts are based on latest district/growth planning forecasts of population growths and development areas.	5.00	5.00	0%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.2	Demand forecasts include assessment of all components that make up demand (e.g. demand influences, pricing, customer types, consumption trends, climate change, demand management initiatives and technology change).	4.00	5.00	4%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.3	The agency derives future demands using historical demand analysis and segmented usage patterns, as well as forecast changes to demand drivers.	4.00	5.00	4%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.4	Demand forecast scenarios are developed, confidence limits are analysed and associated risks are understood.	4.00	4.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.1	The agency determines the "nominal life" of a particular class of asset either on a risk based economic life or on industry standards.	5.00	5.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.2	Current asset capacity/ performance is assessed regularly and compared to demand forecasts to predict 'failure' time.	4.00	5.00	2%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.3	Current asset condition data and operating environment factors used to supplement nominal life calculations for 'failure time'.	3.00	5.00	8%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.4	Asset performance is assessed against target levels of service to predict 'failure time'.	3.00	5.00	8%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.5	The agency uses interview of maintenance personnel and operators to actively bring them into the capability planning and implementation process.	4.00	4.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.6	Failure prediction for critical assets is particularly robust.	4.00	5.00	3%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.1	The agency determines projected failure frequency for assets with a failure history from failure records or other available sources. The agency determines the projected failure frequency for assets without a failure history from condition assessment where justifiable, or by degradation (life cycle) modelling.	4.00	5.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.2	The agency has identified failure modes to a resolution facilitating replacement or rehabilitation decisions.	5.00	5.00	0%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.3	The agency has documented failure modes in failure mode libraries to facilitate future failure modes and effects analysis.	4.00	4.00	0%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.4	The organisation identifies the consequences of failure of its assets	4.00	4.00	0%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.5	The agency assesses the likelihood of failure of the degraded and critical assets.	3.00	4.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.6	The organisation determines the risk posed by a degraded and critical asset should it fail and a record is kept.	4.00	4.00	0%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.1	The agency renewal decision process is documented.	4.00	5.00	3%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.2	The agency has a program of end of economic life rehabilitation / replacement projects based on economic, social and environmental considerations (including physical, capacity and level of service risk).	4.00	5.00	3%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.3	The organisation uses generic class asset class or asset cohort deterioration models for determining future renewal	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.4	The organisation uses individual asset end of life projection based on degradation modelling and failure consequence	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.5	The organisation regularly monitors the condition and/or risk of an asset to update the priority and timing of assets to be renewed prior to failure.	4.00	5.00	2%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.6	The agency projects capital expenditure for asset replacement.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.1	Organisation-wide risk management framework developed, understood and established across the organisation. Framework consistent with ISO 31000. Common risk criteria are used for categorizing risk for all business units in the organization.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.2	Risk thresholds developed with clear linkage to strategic goals, legislative requirements, stakeholder needs and industry practice	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.3	Corporate risk policy in place, clearly identifying corporate and other objectives against which risk will be assessed.	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.4	The agency undertakes risk analysis to identify, quantify and document risk consistent with ISO 31000. The organisation considers internal and external risk and opportunities. Sound processes in place to determine internal and external issues relevant to organisation's purpose that can impact on its ability to achieve the intended outcomes of its AM system	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.5	Risks have been identified and are recorded at a level of detail appropriate to the risk exposure. Risks consider all phases of the asset lifecycle.	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.6	The organisation has prepared a business risk profile, including a network risk and resilience profile.	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.7	Interdependencies (including interdependencies with other utilities) assessed in a systematic manner	3.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.8	The organisation actively participates in Lifelines groups	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.9	Risk mitigation is actively undertaken. Risk management strategies developed with clear actions linked to risk severity following ALARP principles where appropriate	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.10	Risk treatment options developed systematically with consideration of benefits and costs following ALARP principles where appropriate	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.11	Risk analysis includes ensuring that the agency is not "over-controlled" for the risks it faces	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.12	Risk analysis includes assessing the risk associated with failure of risk controls	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.13	The organisation has a formal and ongoing process for review of business context, risk identification and management. Procedures in place to update risk register and policy for those risks not previously identified, where impacts may change or where current or future changes in the organisations operating environment affect risk.	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.14	The organisation audits the risk management procedure for suitability and effectiveness.	4.00	4.00	0%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.1	Different stakeholder groups and expectations/needs identified, and reviewed regularly to identify new stakeholders and emerging/changing needs.	3.00	4.00	5%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.2	Risks and their management are regularly reported to all appropriate stakeholders. Specifically includes monitoring and reporting on changes to the risk profile and on risks that exceed a defined risk level	4.00	5.00	3%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.3	Risks including outage-related levels of service, reviewed regularly, involving stakeholder consultation and feedback. Stakeholder tolerances tested and confirmed	2.00	4.00	9%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.4	Risks including outage-related level of service reviews, include costed options and take account of customer 'willingness to pay'.	1.00	4.00	14%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.5	Customer input is sought to predict future changes in outage-related LOS from changing customer trends and legislative changes.	1.00	4.00	14%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.1	Risk integral to organisations decision-making.	4.00	5.00	4%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.2	Risk quantified on basis of likelihood and consequences for tangible and intangible risk. The agency assesses the consequences of failure on a triple bottom line basis. The consequences are assessed in terms of dollars or dollar equivalents so that risk can be treated as a cost in decision making.	4.00	5.00	3%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.4	Risk mitigation options (projects) to address all predicted risks over the specified thresholds have been identified.	5.00	5.00	0%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.5	Projects have been selected and prioritised based on lifecycle cost and TBL analysis consistently across all activity areas.	3.00	5.00	8%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.6	The agency includes stakeholder liaison for social, economic and environmental factors as part of the options analysis.	2.00	4.00	7%
3	Asset Management Practices	3.1	Design Processes	3.1.1	Documented design/construction standards exist and are regularly updated considering TBL aspects and past performance with operator and maintainer input.	5.00	5.00	0%
3	Asset Management Practices	3.1	Design Processes	3.1.2	Documented design/construction standards are routinely used for asset design.	5.00	5.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.1	The organisation uses formal acceptance procedures to ensure that equipment is built physically according to specification.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.2	The organisation uses formal acceptance procedures to ensure that equipment performs to the functional specification.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.3	The organisation has acceptance procedures for the technical information package comprising: drawings; operating manuals; equipment/product lists and specifications; maintenance manuals; operational software listings; and costs.	3.00	4.00	6%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.4	The agency provides necessary training to personnel managing, operating or maintaining the new or modified asset prior to acceptance of the asset.	4.00	4.00	0%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.1	O & M strategy is risk-focused and optimises reactive, preventative maintenance and renewals options.	3.00	4.00	10%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.2	Documented maintenance policies for assets covering both planned and unplanned activities that outline overall maintenance objectives and strategies.	4.00	5.00	5%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.3	Analysis to determine cause of failures and to prevent recurrence.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.1	Operations and maintenance procedures manuals are available for all plant and mechanical assets in appropriate form.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.2	Processes in place to ensure that the manuals are kept up to date.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.3	The agency has a quality procedure from the time of acceptance, that is implemented and followed ensuring change to asset configuration is managed throughout the utilisation phase of the asset life, such that at any given time the technical records are representative of the physical assets.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.4	The agency has effected an operational risk identification program and has documented the results.	4.00	5.00	2%
3	Asset Management Practices	3.4	O & M Plans	3.4.5	The agency has undertaken formal analysis on the basis of likelihood and consequence and the cost of managing the risk. This has resulted in a prioritised operational risk mitigation program.	4.00	5.00	2%
3	Asset Management Practices	3.4	O & M Plans	3.4.6	The agency addresses operational risks identified for action in a timely and controlled manner, either by implementation of physical changes or through operating procedural initiatives.	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.7	The organisation has a Safety Management System in accordance with NZS 7901:2014 and AS/NZS 2885.6:2018	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
3	Asset Management Practices	3.4	O & M Plans	3.4.8	Procedures in place for rapid and structured response to emergency failures. These procedures are regularly tested and reviewed. Maintenance plans have specific plans for critical events and critical asset failures.	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.9	The agency audits to ensure adequate treatment of risks, and to identify new operational risks.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.10	The organisation has a process or procedure that captures and integrates the outcomes of incidents or emergencies into the O&M Plans or RM Plans	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.11	Formal emergency response plans and business continuity plans developed and periodically tested and reviewed	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.1	The agency has an understanding of the principles of failure modes and effects analysis.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.2	The agency has identified failure modes to a resolution suitable for the management of its maintenance	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.3	The agency records failure modes in failure mode libraries to facilitate future analysis.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.4	The agency has a risk analysis procedure quantifying maintenance and operations risk	4.00	5.00	2%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.5	The organisation calculates risk for each failure mode and a record is held against the asset or equipment. Risk is based on consequence for each failure mode and likelihood in terms of projected frequency of each failure mode, either from historical performance, published reliability data or from statistical or physical condition degradation models.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.6	The agency identifies high consequence assets and these are considered for preventive maintenance	4.00	5.00	2%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.7	The organisation requires operators to develop failure contingency plans where for high consequence assets, preventive maintenance is considered unjustifiable because of low likelihood of failure.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.8	The agency maintenance management strategy comprises a "roll up" of the maintenance targeting each failure mode.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.9	The agency has planned and unplanned maintenance procedures. These are readily available to maintenance personnel for both planned and unplanned situations.	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.10	The agency generates a record of maintenance task non-performance backlog by which "catch up" maintenance is managed.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.11	The agency regularly reviews records of maintenance task non performance and addresses these through strategy, management or workforce changes.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.12	The agency changes maintenance procedures as a result of root cause analysis of equipment failures to prevent recurrence.	4.00	3.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
4	Information Systems	4.1	Asset Register System	4.1.1	Asset register is flexible and allows definition and recording recording of all needed asset types and attributes.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.2	Asset register has suitable reporting capabilities available - can be third party or through use of BI tools etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.3	Asset register can be interfaced / integrated with other business systems e.g through use of API's and web services etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.4	Asset register is accessible (locally and remotely) and 'user friendly'.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.5	Asset register supports changeable hierarchical definition of assets and data can be grouped at alternative levels.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.6	Uses an audit trail to track changes to asset data.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.1	GIS holds appropriate spatial representation of assets.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.2	GIS is linked to asset register for access to underlying asset attribute data.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.3	GIS provides validation checks and tools to ensure data integrity is maintained between the GIS and asset register .	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.4	Plans and records in a suitable form, readily available, accessible and current.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.5	All new works recorded in system as 'asbuilts'.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.6	GIS is 'user-friendly' and readily accessible to all staff.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.1	System available to manage requests relating to complaints and observations by both public and staff with regard to the performance or failure of assets	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.2	System records all the necessary details relating to the service request including customer/staff contact details	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.3	System is linked to asset register and/or maintenance management system so that remedial works can be linked to assets	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.5	System can capture remedial works data for assets including costs, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.1	System available to manage work orders / work requests	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.2	System can capture historic cost data for assets, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.3	System can capture works data for assets, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.5	System is linked to asset register so that maintenance activity is directly linked to assets and supports the validation of asset attribute data.	6.00	6.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.1	System available to manage condition gradings and accommodates industry recognised condition grading scales appropriate for the variety of assets that need regular monitoring.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.2	System is linked to the asset register so that condition grades directly relate to assets.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.3	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.4	System can interface with or export data for use with other third party analytical software.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.1	SCADA system is used to monitor and control operations on the network.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.2	SCADA System is linked to other systems such as maintenance management.	2.00	5.00	12%
4	Information Systems	4.6	SCADA System	4.6.3	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.4	System can interface with or export data for use with other third party analytical software.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.1	Models available to determine timing of failure with respect to capacity.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.2	Models available to determine asset capacity.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.3	Models accurately represent assets.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.4	Models are user-friendly, robust and accessible.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.1	System allows the definition and identification of failure events / modes.	3.00	4.00	4%
4	Information Systems	4.8	Advanced RM Systems	4.8.2	System allows the definition and identification of consequences of physical failure and failure to deliver LOS in point and $ terms.	4.00	5.00	2%
4	Information Systems	4.8	Advanced RM Systems	4.8.3	System allows the identification of probability of failure for each event / mode	4.00	4.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.4	System can calculate a risk score (rating) and risk cost for assets or facilities.	3.00	5.00	6%
4	Information Systems	4.8	Advanced RM Systems	4.8.5	System can rank assets in terms of criticality	3.00	5.00	6%
4	Information Systems	4.8	Advanced RM Systems	4.8.6	System is user-friendly and accessible.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
5	Organisational Tactics	5.1	RM Improvement	5.1.1	Staff place high priority on completing RM improvements.	5.00	5.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.2	Process in place for regularly monitoring improvement plan progress.	5.00	5.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.3	Independent audits undertaken to identify improvements.	4.00	4.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.4	Improvement plan updated annually.	4.00	4.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.5	RM improvements from last review/plan completed as per programme.	4.00	4.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.6	The utility undertakes routine self-assessment and formalized benchmarking to compare and continually improve its practice and performance.	3.00	4.00	5%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.1	The organisation undertakes an assessment determining whether it should hold spares and consumables in stock.	4.00	4.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.2	Organisation ensures that core network information is 'owned' and retained in-house.	5.00	5.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.3	Organisation assesses risks associated with outsourced activities and ensures that risks are identified, assessed and adequately controlled in keeping with its risk management framework	4.00	5.00	3%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.4	Formal quality system in place	3.00	4.00	5%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.1	Board and senior managers approve RM plan regularly (at least annually).	4.00	5.00	4%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.2	Board and senior managers consulted during RM plan development.	4.00	5.00	4%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.3	Adequate resources available for RM plan development. A sense of urgency exists within the organization to continue to establish and improve its level of practice around RM.	5.00	5.00	0%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.4	Corporate teams with appropriate RM skills, direction and staffing, working collaboratively across functions to deliver improvements in RM.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.1	RM roles and responsibilities clearly defined and documented in all organisational units (including documentation in Position Descriptions).	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.2	There is alignment and understanding at the senior level and agreement of roles/responsibilities and how they support each other.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.3	Planning in place to minimise risks relating to loss of key staff knowledge.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.4	Specified staff responsible for ensuring that procedures and documentation are up to date and reflect current practice and policies.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.5	Staff are informed & aware of risk procedures and policies and their own risk management responsibilities.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.6	Risk management plans are developed with input from staff at all levels of asset management processes.	5.00	5.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.1	Required RM competencies identified and organisational capability systematically assessed specifically identifying skill gaps.	4.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.2	Staff regularly attend workshops as appropriate to close skill gaps.	4.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.3	Knowledge sharing and exchange of personnel is used to foster RM principles and practices.	5.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.4	Level of RM expertise is appropriate to each job.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.2	Organisation monitors possible legislative changes or changes in standards that may have an impact on its operations or policies.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.1	Organisational and commercial tactics & RM strategy reviewed to incorporate changes in regulations and standards.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.3	Organisation informs staff of legislative changes affecting their work.	5.00	5.00	0%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.1	The organisation understands its organisational resilience through a structured assessment using industry-accepted frameworks/tools (e.g. OrgResTool)	4.00	4.00	0%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.2	The organisation has an organisational resilience strategy in place which is actively implemented	4.00	4.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
5	Organisational Tactics	5.7	Organisational Resilience	5.7.3	The organisational resilience strategy is regularly reviewed and progress monitored/reported as appropriate	4.00	4.00	0%

Appendix D

Assessment Details
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Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.1	Asset Categorisation	1.1.1	Asset register data established to a defined and documented hierarchy / structure.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.2	Components are broken down an appropriate AM level e.g. maintenance managed item (MMI).	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.3	Asset data can easily be queried and grouped based on asset hierarchy / structure.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.4	Unique asset ID is used consistently throughout organisation / systems.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.5	Data is complete and accurate	4.00	5.00	3%
1	Asset Knowledge	1.2	Location Data	1.2.1	Asset register contains descriptive location information that further supports the locating of assets.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.2	Assets are represented spatially in GIS, level information (Z co-ordinates) recorded in asset register.	4.00	5.00	4%
1	Asset Knowledge	1.2	Location Data	1.2.3	Location information recorded for all assets in as-built drawings which are produced to a defined standard.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.4	Documented processes in place to routinely update / improve location data.	5.00	6.00	3%
1	Asset Knowledge	1.2	Location Data	1.2.5	Data is complete and accurate	4.00	6.00	6%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.1	Asset register contains key dimensions for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.2	Asset register contains material type for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.3	Attribute information recorded to sufficient detail for AM purposes.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.4	Attribute information is populated from accurate records or inspections.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.5	Source of attribute information is recorded	4.00	5.00	2%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.6	A documented process is in place and ensures the asset register is routinely updated / improved.	5.00	6.00	2%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.7	Data is complete and accurate	5.00	6.00	2%
1	Asset Knowledge	1.4	O & M Data	1.4.1	Planned maintenance schedules are recorded in maintenance management system.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.2	Failure history is recorded against the asset	3.00	5.00	8%
1	Asset Knowledge	1.4	O & M Data	1.4.3	O&M activities (work orders or work requests) are recorded against assets or facilities suitable for AM analysis and reporting.	4.00	5.00	3%
1	Asset Knowledge	1.4	O & M Data	1.4.4	Customer service requests for unplanned maintenance are recorded and action tracked.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.5	Documented processes ensures O&M data or any asset changes resulting from O&M activities are recorded.	4.00	6.00	5%
1	Asset Knowledge	1.4	O & M Data	1.4.6	Data is complete and accurate	4.00	5.00	2%
1	Asset Knowledge	1.5	Condition Data	1.5.1	Condition grading at asset component level completed as appropriate to asset type / criticality.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.2	Condition grading completed by person/s with knowledge of type of assets being assessed.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.3	An industry recognised condition grading scale appropriate to type of assets being assessed is utilised.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.4	Historical and current condition grades recorded so that rate of deterioration can be tracked.	4.00	5.00	3%
1	Asset Knowledge	1.5	Condition Data	1.5.5	Documented optimised processes are in place to capture, update and report on asset condition data and ensure consistent application.	4.00	5.00	2%
1	Asset Knowledge	1.5	Condition Data	1.5.6	Data is complete and accurate	3.00	5.00	6%
1	Asset Knowledge	1.6	Capacity Data	1.6.1	Asset capacity is recorded accurately.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.2	Utilisation level of assets measured at regular intervals and recorded.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.3	Quality of utilisation data reflects asset criticality.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.4	Historical information held to enable monitoring of trends.	5.00	5.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.5	Documented processes are in place to capture, update and report on utilisation.	4.00	5.00	3%
1	Asset Knowledge	1.7	Performance Data	1.7.1	Documented asset performance measures in place.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.2	Asset performance measured at least annually.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.3	Historical information held to enable monitoring of trends.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.4	Asset performance reported to asset managers.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.5	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.1	Accurate asset age recorded for all assets.	4.00	5.00	5%
1	Asset Knowledge	1.8	Asset Life Data	1.8.2	Processes in place and undertaken for recording the creation date of assets.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.3	Physical lives of assets assessed based on condition, capacity and performance information.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.4	Lives of asset from ODM process recorded in register.	3.00	5.00	6%
1	Asset Knowledge	1.8	Asset Life Data	1.8.5	Evidence of application of formal review of asset lives annually.	3.00	5.00	4%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.9	Risk Management Data	1.9.1	Risk rating held at asset or facility level (as appropriate to level of risk).	3.00	4.00	5%
1	Asset Knowledge	1.9	Risk Management Data	1.9.2	The agency identifies from data records, risks with a history of realisation.	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.3	Processes in place to update or maintain risk data.	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.4	Critical assets are identified and recorded including criticality ratings.	3.00	4.00	5%
1	Asset Knowledge	1.9	Risk Management Data	1.9.5	Risk mitigation actions and projects recorded against assets.	3.00	4.00	4%
1	Asset Knowledge	1.9	Risk Management Data	1.9.6	Data is complete and accurate	4.00	4.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.1	The agency captures full cost information against the asset, including acquisition costs, overhead costs, O & M costs, renewal costs and disposal costs	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.2	Cost data held for creation/acquisition, maintenance, and renewals are sufficient that analysts can determine the most appropriate long term life cycle cost approach for the assets concerned.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.3	Cost data held for social and environmental aspects, as well as financial aspects related to unexpected failures	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.4	Asset replacement values based on a database of recently completed works - must be appropriate for revaluation purposes.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.5	Asset maint/renewals/creation categories documented and consistent with valuation component level.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.6	Data is complete and accurate	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.1	Demand forecasts are based on latest district/growth planning forecasts of population growths and development areas.	5.00	5.00	0%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.2	Demand forecasts include assessment of all components that make up demand (e.g. demand influences, pricing, customer types, consumption trends, climate change, demand management initiatives and technology change).	5.00	5.00	0%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.3	The agency derives future demands using historical demand analysis and segmented usage patterns, as well as forecast changes to demand drivers.	5.00	5.00	0%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.4	Demand forecast scenarios are developed, confidence limits are analysed and associated risks are understood.	4.00	4.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.1	The agency determines the "nominal life" of a particular class of asset either on a risk based economic life or on industry standards.	5.00	5.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.2	Current asset capacity/ performance is assessed regularly and compared to demand forecasts to predict 'failure' time.	5.00	5.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.3	Current asset condition data and operating environment factors used to supplement nominal life calculations for 'failure time'.	3.00	5.00	8%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.4	Asset performance is assessed against target levels of service to predict 'failure time'.	3.00	5.00	8%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.5	The agency uses interview of maintenance personnel and operators to actively bring them into the capability planning and implementation process.	4.00	4.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.6	Failure prediction for critical assets is particularly robust.	4.00	5.00	3%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.1	The agency determines projected failure frequency for assets with a failure history from failure records or other available sources. The agency determines the projected failure frequency for assets without a failure history from condition assessment where justifiable, or by degradation (life cycle) modelling.	4.00	5.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.2	The agency has identified failure modes to a resolution facilitating replacement or rehabilitation decisions.	5.00	5.00	0%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.3	The agency has documented failure modes in failure mode libraries to facilitate future failure modes and effects analysis.	4.00	4.00	0%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.4	The organisation identifies the consequences of failure of its assets	3.00	4.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.5	The agency assesses the likelihood of failure of the degraded and critical assets.	3.00	4.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.6	The organisation determines the risk posed by a degraded and critical asset should it fail and a record is kept.	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.1	The agency renewal decision process is documented.	5.00	5.00	0%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.2	The agency has a program of end of economic life rehabilitation / replacement projects based on economic, social and environmental considerations (including physical, capacity and level of service risk).	4.00	5.00	3%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.3	The organisation uses generic class asset class or asset cohort deterioration models for determining future renewal	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.4	The organisation uses individual asset end of life projection based on degradation modelling and failure consequence	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.5	The organisation regularly monitors the condition and/or risk of an asset to update the priority and timing of assets to be renewed prior to failure.	4.00	5.00	2%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.6	The agency projects capital expenditure for asset replacement.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.1	Organisation-wide risk management framework developed, understood and established across the organisation. Framework consistent with ISO 31000. Common risk criteria are used for categorizing risk for all business units in the organization.	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.2	Risk thresholds developed with clear linkage to strategic goals, legislative requirements, stakeholder needs and industry practice	4.00	5.00	2%

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2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.3	Corporate risk policy in place, clearly identifying corporate and other objectives against which risk will be assessed.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.4	The agency undertakes risk analysis to identify, quantify and document risk consistent with ISO 31000. The organisation considers internal and external risk and opportunities. Sound processes in place to determine internal and external issues relevant to organisation's purpose that can impact on its ability to achieve the intended outcomes of its AM system	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.5	Risks have been identified and are recorded at a level of detail appropriate to the risk exposure. Risks consider all phases of the asset lifecycle.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.6	The organisation has prepared a business risk profile, including a network risk and resilience profile.	3.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.7	Interdependencies (including interdependencies with other utilities) assessed in a systematic manner	3.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.8	The organisation actively participates in Lifelines groups	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.9	Risk mitigation is actively undertaken. Risk management strategies developed with clear actions linked to risk severity following ALARP principles where appropriate	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.10	Risk treatment options developed systematically with consideration of benefits and costs following ALARP principles where appropriate	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.11	Risk analysis includes ensuring that the agency is not "over-controlled" for the risks it faces	2.00	4.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.12	Risk analysis includes assessing the risk associated with failure of risk controls	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.13	The organisation has a formal and ongoing process for review of business context, risk identification and management. Procedures in place to update risk register and policy for those risks not previously identified, where impacts may change or where current or future changes in the organisations operating environment affect risk.	4.00	5.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.14	The organisation audits the risk management procedure for suitability and effectiveness.	2.00	4.00	2%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.1	Different stakeholder groups and expectations/needs identified, and reviewed regularly to identify new stakeholders and emerging/changing needs.	3.00	4.00	5%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.2	Risks and their management are regularly reported to all appropriate stakeholders. Specifically includes monitoring and reporting on changes to the risk profile and on risks that exceed a defined risk level	4.00	5.00	3%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.3	Risks including outage-related levels of service, reviewed regularly, involving stakeholder consultation and feedback. Stakeholder tolerances tested and confirmed	3.00	4.00	5%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.4	Risks including outage-related level of service reviews, include costed options and take account of customer 'willingness to pay'.	2.00	4.00	9%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.5	Customer input is sought to predict future changes in outage-related LOS from changing customer trends and legislative changes.	1.00	4.00	14%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.1	Risk integral to organisations decision-making.	4.00	5.00	4%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.2	Risk quantified on basis of likelihood and consequences for tangible and intangible risk. The agency assesses the consequences of failure on a triple bottom line basis. The consequences are assessed in terms of dollars or dollar equivalents so that risk can be treated as a cost in decision making.	3.00	5.00	8%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.4	Risk mitigation options (projects) to address all predicted risks over the specified thresholds have been identified.	5.00	5.00	0%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.5	Projects have been selected and prioritised based on lifecycle cost and TBL analysis consistently across all activity areas.	3.00	5.00	8%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.6	The agency includes stakeholder liaison for social, economic and environmental factors as part of the options analysis.	2.00	4.00	7%
3	Asset Management Practices	3.1	Design Processes	3.1.1	Documented design/construction standards exist and are regularly updated considering TBL aspects and past performance with operator and maintainer input.	5.00	5.00	0%
3	Asset Management Practices	3.1	Design Processes	3.1.2	Documented design/construction standards are routinely used for asset design.	5.00	5.00	0%

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3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.1	The organisation uses formal acceptance procedures to ensure that equipment is built physically according to specification.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.2	The organisation uses formal acceptance procedures to ensure that equipment performs to the functional specification.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.3	The organisation has acceptance procedures for the technical information package comprising: drawings; operating manuals; equipment/product lists and specifications; maintenance manuals; operational software listings; and costs.	4.00	4.00	0%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.4	The agency provides necessary training to personnel managing, operating or maintaining the new or modified asset prior to acceptance of the asset.	4.00	4.00	0%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.1	O & M strategy is risk-focused and optimises reactive, preventative maintenance and renewals options.	3.00	4.00	10%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.2	Documented maintenance policies for assets covering both planned and unplanned activities that outline overall maintenance objectives and strategies.	4.00	5.00	5%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.3	Analysis to determine cause of failures and to prevent recurrence.	3.00	4.00	8%
3	Asset Management Practices	3.4	O & M Plans	3.4.1	Operations and maintenance procedures manuals are available for all plant and mechanical assets in appropriate form.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.2	Processes in place to ensure that the manuals are kept up to date.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.3	The agency has a quality procedure from the time of acceptance, that is implemented and followed ensuring change to asset configuration is managed throughout the utilisation phase of the asset life, such that at any given time the technical records are representative of the physical assets.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.4	The agency has effected an operational risk identification program and has documented the results.	4.00	5.00	2%
3	Asset Management Practices	3.4	O & M Plans	3.4.5	The agency has undertaken formal analysis on the basis of likelihood and consequence and the cost of managing the risk. This has resulted in a prioritised operational risk mitigation program.	4.00	5.00	2%
3	Asset Management Practices	3.4	O & M Plans	3.4.6	The agency addresses operational risks identified for action in a timely and controlled manner, either by implementation of physical changes or through operating procedural initiatives.	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.7	The organisation has a Safety Management System in accordance with NZS 7901:2014 and AS/NZS 2885.6:2018	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.8	Procedures in place for rapid and structured response to emergency failures. These procedures are regularly tested and reviewed. Maintenance plans have specific plans for critical events and critical asset failures.	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.9	The agency audits to ensure adequate treatment of risks, and to identify new operational risks.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.10	The organisation has a process or procedure that captures and integrates the outcomes of incidents or emergencies into the O&M Plans or RM Plans	5.00	5.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.11	Formal emergency response plans and business continuity plans developed and periodically tested and reviewed	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.1	The agency has an understanding of the principles of failure modes and effects analysis.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.2	The agency has identified failure modes to a resolution suitable for the management of its maintenance	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.3	The agency records failure modes in failure mode libraries to facilitate future analysis.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.4	The agency has a risk analysis procedure quantifying maintenance and operations risk	4.00	5.00	2%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.5	The organisation calculates risk for each failure mode and a record is held against the asset or equipment. Risk is based on consequence for each failure mode and likelihood in terms of projected frequency of each failure mode, either from historical performance, published reliability data or from statistical or physical condition degradation models.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.6	The agency identifies high consequence assets and these are considered for preventive maintenance	4.00	5.00	2%

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3	Asset Management Practices	3.5	Maintenance Execution	3.5.7	The organisation requires operators to develop failure contingency plans where for high consequence assets, preventive maintenance is considered unjustifiable because of low likelihood of failure.	3.00	4.00	3%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.8	The agency maintenance management strategy comprises a "roll up" of the maintenance targeting each failure mode.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.9	The agency has planned and unplanned maintenance procedures. These are readily available to maintenance personnel for both planned and unplanned situations.	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.10	The agency generates a record of maintenance task non-performance backlog by which "catch up" maintenance is managed.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.11	The agency regularly reviews records of maintenance task non performance and addresses these through strategy, management or workforce changes.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.12	The agency changes maintenance procedures as a result of root cause analysis of equipment failures to prevent recurrence.	3.00	3.00	0%

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4	Information Systems	4.1	Asset Register System	4.1.1	Asset register is flexible and allows definition and recording of all needed asset types and attributes.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.2	Asset register has suitable reporting capabilities available - can be third party or through use of BI tools etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.3	Asset register can be interfaced / integrated with other business systems e.g through use of API's and web services etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.4	Asset register is accessible (locally and remotely) and 'user friendly'.	3.00	5.00	6%
4	Information Systems	4.1	Asset Register System	4.1.5	Asset register supports changeable hierarchical definition of assets and data can be grouped at alternative levels.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.6	Uses an audit trail to track changes to asset data.	4.00	5.00	1%
4	Information Systems	4.1	Asset Register System	4.1.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.1	GIS holds appropriate spatial representation of assets.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.2	GIS is linked to asset register for access to underlying asset attribute data.	4.00	5.00	2%
4	Information Systems	4.2	Geographic Information System	4.2.3	GIS provides validation checks and tools to ensure data integrity is maintained between the GIS and asset register .	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.4	Plans and records in a suitable form, readily available, accessible and current.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.5	All new works recorded in system as 'asbuilts'.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.6	GIS is 'user-friendly' and readily accessible to all staff.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.1	System available to manage requests relating to complaints and observations by both public and staff with regard to the performance or failure of assets	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.2	System records all the necessary details relating to the service request including customer/staff contact details	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.3	System is linked to asset register and/or maintenance management system so that remedial works can be linked to assets	3.00	5.00	6%
4	Information Systems	4.3	Customer Service System	4.3.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.5	System can capture remedial works data for assets including costs, appropriate for AM analysis.	4.00	5.00	2%
4	Information Systems	4.3	Customer Service System	4.3.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.1	System available to manage work orders / work requests	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.2	System can capture historic cost data for assets, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.3	System can capture works data for assets, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.5	System is linked to asset register so that maintenance activity is directly linked to assets and supports the validation of asset attribute data.	4.00	6.00	6%
4	Information Systems	4.4	Maintenance Management System	4.4.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.1	System available to manage condition gradings and accommodates industry recognised condition grading scales appropriate for the variety of assets that need regular monitoring.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.2	System is linked to the asset register so that condition grades directly relate to assets.	4.00	5.00	3%
4	Information Systems	4.5	Condition Monitoring System	4.5.3	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.4	System can interface with or export data for use with other third party analytical software.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.1	SCADA system is used to monitor and control operations on the network.	4.00	4.00	0%
4	Information Systems	4.6	SCADA System	4.6.2	SCADA System is linked to other systems such as maintenance management.	3.00	5.00	8%
4	Information Systems	4.6	SCADA System	4.6.3	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.4	System can interface with or export data for use with other third party analytical software.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.1	Models available to determine timing of failure with respect to capacity.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.2	Models available to determine asset capacity.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.3	Models accurately represent assets.	5.00	5.00	0%

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4	Information Systems	4.7	Capacity / Utilisation Models	4.7.4	Models are user-friendly, robust and accessible.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.1	System allows the definition and identification of failure events / modes.	3.00	4.00	4%
4	Information Systems	4.8	Advanced RM Systems	4.8.2	System allows the definition and identification of consequences of physical failure and failure to deliver LOS in point and $ terms.	4.00	5.00	2%
4	Information Systems	4.8	Advanced RM Systems	4.8.3	System allows the identification of probability of failure for each event / mode	4.00	4.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.4	System can calculate a risk score (rating) and risk cost for assets or facilities.	3.00	5.00	6%
4	Information Systems	4.8	Advanced RM Systems	4.8.5	System can rank assets in terms of criticality	3.00	5.00	6%
4	Information Systems	4.8	Advanced RM Systems	4.8.6	System is user-friendly and accessible.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
5	Organisational Tactics	5.1	RM Improvement	5.1.1	Staff place high priority on completing RM improvements.	4.00	5.00	2%
5	Organisational Tactics	5.1	RM Improvement	5.1.2	Process in place for regularly monitoring improvement plan progress.	3.00	5.00	8%
5	Organisational Tactics	5.1	RM Improvement	5.1.3	Independent audits undertaken to identify improvements.	4.00	4.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.4	Improvement plan updated annually.	3.00	4.00	3%
5	Organisational Tactics	5.1	RM Improvement	5.1.5	RM improvements from last review/plan completed as per programme.	3.00	4.00	8%
5	Organisational Tactics	5.1	RM Improvement	5.1.6	The utility undertakes routine self-assessment and formalized benchmarking to compare and continually improve its practice and performance.	2.00	4.00	9%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.1	The organisation undertakes an assessment determining whether it should hold spares and consumables in stock.	4.00	4.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.2	Organisation ensures that core network information is 'owned' and retained in-house.	5.00	5.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.3	Organisation assesses risks associated with outsourced activities and ensures that risks are identified, assessed and adequately controlled in keeping with its risk management framework	3.00	5.00	8%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.4	Formal quality system in place	3.00	4.00	5%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.1	Board and senior managers approve RM plan regularly (at least annually).	4.00	5.00	4%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.2	Board and senior managers consulted during RM plan development.	4.00	5.00	4%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.3	Adequate resources available for RM plan development. A sense of urgency exists within the organization to continue to establish and improve its level of practice around RM.	5.00	5.00	0%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.4	Corporate teams with appropriate RM skills, direction and staffing, working collaboratively across functions to deliver improvements in RM.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.1	RM roles and responsibilities clearly defined and documented in all organisational units (including documentation in Position Descriptions).	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.2	There is alignment and understanding at the senior level and agreement of roles/responsibilities and how they support each other.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.3	Planning in place to minimise risks relating to loss of key staff knowledge.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.4	Specified staff responsible for ensuring that procedures and documentation are up to date and reflect current practice and policies.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.5	Staff are informed & aware of risk procedures and policies and their own risk management responsibilities.	4.00	5.00	2%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.6	Risk management plans are developed with input from staff at all levels of asset management processes.	4.00	5.00	4%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.1	Required RM competencies identified and organisational capability systematically assessed specifically identifying skill gaps.	3.00	4.00	8%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.2	Staff regularly attend workshops as appropriate to close skill gaps.	4.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.3	Knowledge sharing and exchange of personnel is used to foster RM principles and practices.	4.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.4	Level of RM expertise is appropriate to each job.	4.00	5.00	5%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.2	Organisation monitors possible legislative changes or changes in standards that may have an impact on its operations or policies.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.1	Organisational and commercial tactics & RM strategy reviewed to incorporate changes in regulations and standards.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.3	Organisation informs staff of legislative changes affecting their work.	5.00	5.00	0%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.1	The organisation understands its organisational resilience through a structured assessment using industry-accepted frameworks/tools (e.g. OrgResTool)	3.00	4.00	10%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.2	The organisation has an organisational resilience strategy in place which is actively implemented	3.00	4.00	8%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.3	The organisational resilience strategy is regularly reviewed and progress monitored/reported as appropriate	3.00	4.00	8%

Appendix E

Assessment Details GasNet

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.1	Asset Categorisation	1.1.1	Asset register data established to a defined and documented hierarchy / structure.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.2	Components are broken down an appropriate AM level e.g. maintenance managed item (MMI).	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.3	Asset data can easily be queried and grouped based on asset hierarchy / structure.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.4	Unique asset ID is used consistently throughout organisation / systems.	5.00	5.00	0%
1	Asset Knowledge	1.1	Asset Categorisation	1.1.5	Data is complete and accurate	4.00	5.00	3%
1	Asset Knowledge	1.2	Location Data	1.2.1	Asset register contains descriptive location information that further supports the locating of assets.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.2	Assets are represented spatially in GIS, level information (Z co-ordinates) recorded in asset register.	4.00	5.00	4%
1	Asset Knowledge	1.2	Location Data	1.2.3	Location information recorded for all assets in as-built drawings which are produced to a defined standard.	5.00	5.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.4	Documented processes in place to routinely update / improve location data.	6.00	6.00	0%
1	Asset Knowledge	1.2	Location Data	1.2.5	Data is complete and accurate	5.00	6.00	3%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.1	Asset register contains key dimensions for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.2	Asset register contains material type for all assets.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.3	Attribute information recorded to sufficient detail for AM purposes.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.4	Attribute information is populated from accurate records or inspections.	5.00	5.00	0%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.5	Source of attribute information is recorded	4.00	5.00	2%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.6	A documented process is in place and ensures the asset register is routinely updated / improved.	5.00	6.00	2%
1	Asset Knowledge	1.3	Physical Attributes Data	1.3.7	Data is complete and accurate	5.00	6.00	2%
1	Asset Knowledge	1.4	O & M Data	1.4.1	Planned maintenance schedules are recorded in maintenance management system.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.2	Failure history is recorded against the asset	3.00	5.00	8%
1	Asset Knowledge	1.4	O & M Data	1.4.3	O&M activities (work orders or work requests) are recorded against assets or facilities suitable for AM analysis and reporting.	3.00	5.00	8%
1	Asset Knowledge	1.4	O & M Data	1.4.4	Customer service requests for unplanned maintenance are recorded and action tracked.	5.00	5.00	0%
1	Asset Knowledge	1.4	O & M Data	1.4.5	Documented processes ensures O&M data or any asset changes resulting from O&M activities are recorded.	4.00	6.00	5%
1	Asset Knowledge	1.4	O & M Data	1.4.6	Data is complete and accurate	3.00	5.00	6%
1	Asset Knowledge	1.5	Condition Data	1.5.1	Condition grading at asset component level completed as appropriate to asset type / criticality.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.2	Condition grading completed by person/s with knowledge of type of assets being assessed.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.3	An industry recognised condition grading scale appropriate to type of assets being assessed is utilised.	5.00	5.00	0%
1	Asset Knowledge	1.5	Condition Data	1.5.4	Historical and current condition grades recorded so that rate of deterioration can be tracked.	4.00	5.00	3%
1	Asset Knowledge	1.5	Condition Data	1.5.5	Documented optimised processes are in place to capture, update and report on asset condition data and ensure consistent application.	4.00	5.00	2%
1	Asset Knowledge	1.5	Condition Data	1.5.6	Data is complete and accurate	3.00	5.00	6%
1	Asset Knowledge	1.6	Capacity Data	1.6.1	Asset capacity is recorded accurately.	3.00	4.00	6%
1	Asset Knowledge	1.6	Capacity Data	1.6.2	Utilisation level of assets measured at regular intervals and recorded.	3.00	4.00	6%
1	Asset Knowledge	1.6	Capacity Data	1.6.3	Quality of utilisation data reflects asset criticality.	3.00	4.00	4%
1	Asset Knowledge	1.6	Capacity Data	1.6.4	Historical information held to enable monitoring of trends.	4.00	4.00	0%
1	Asset Knowledge	1.6	Capacity Data	1.6.5	Documented processes are in place to capture, update and report on utilisation.	3.00	4.00	5%
1	Asset Knowledge	1.7	Performance Data	1.7.1	Documented asset performance measures in place.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.2	Asset performance measured at least annually.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.3	Historical information held to enable monitoring of trends.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.4	Asset performance reported to asset managers.	5.00	5.00	0%
1	Asset Knowledge	1.7	Performance Data	1.7.5	Data is complete and accurate	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.1	Accurate asset age recorded for all assets.	4.00	5.00	5%
1	Asset Knowledge	1.8	Asset Life Data	1.8.2	Processes in place and undertaken for recording the creation date of assets.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.3	Physical lives of assets assessed based on condition, capacity and performance information.	5.00	5.00	0%
1	Asset Knowledge	1.8	Asset Life Data	1.8.4	Lives of asset from ODM process recorded in register.	3.00	5.00	6%
1	Asset Knowledge	1.8	Asset Life Data	1.8.5	Evidence of application of formal review of asset lives annually.	3.00	5.00	4%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
1	Asset Knowledge	1.9	Risk Management Data	1.9.1	Risk rating held at asset or facility level (as appropriate to level of risk).	3.00	4.00	5%
1	Asset Knowledge	1.9	Risk Management Data	1.9.2	The agency identifies from data records, risks with a history of realisation.	3.00	4.00	3%
1	Asset Knowledge	1.9	Risk Management Data	1.9.3	Processes in place to update or maintain risk data.	4.00	4.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.4	Critical assets are identified and recorded including criticality ratings.	3.00	4.00	5%
1	Asset Knowledge	1.9	Risk Management Data	1.9.5	Risk mitigation actions and projects recorded against assets.	3.00	3.00	0%
1	Asset Knowledge	1.9	Risk Management Data	1.9.6	Data is complete and accurate	3.00	4.00	5%
1	Asset Knowledge	1.10	Financial Data	1.10.1	The agency captures full cost information against the asset, including acquisition costs, overhead costs, O & M costs, renewal costs and disposal costs	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.2	Cost data held for creation/acquisition, maintenance, and renewals are sufficient that analysts can determine the most appropriate long term life cycle cost approach for the assets concerned.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.3	Cost data held for social and environmental aspects, as well as financial aspects related to unexpected failures	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.4	Asset replacement values based on a database of recently completed works - must be appropriate for revaluation purposes.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.5	Asset maint/renewals/creation categories documented and consistent with valuation component level.	5.00	5.00	0%
1	Asset Knowledge	1.10	Financial Data	1.10.6	Data is complete and accurate	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.1	Demand forecasts are based on latest district/growth planning forecasts of population growths and development areas.	4.00	4.00	0%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.2	Demand forecasts include assessment of all components that make up demand (e.g. demand influences, pricing, customer types, consumption trends, climate change, demand management initiatives and technology change).	3.00	4.00	6%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.3	The agency derives future demands using historical demand analysis and segmented usage patterns, as well as forecast changes to demand drivers.	3.00	4.00	6%
2	Strategic Planning Processes	2.1	Demand Forecasting Processes	2.1.4	Demand forecast scenarios are developed, confidence limits are analysed and associated risks are understood.	3.00	3.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.1	The agency determines the "nominal life" of a particular class of asset either on a risk based economic life or on industry standards.	5.00	5.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.2	Current asset capacity/ performance is assessed regularly and compared to demand forecasts to predict 'failure' time.	3.00	4.00	4%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.3	Current asset condition data and operating environment factors used to supplement nominal life calculations for 'failure time'.	3.00	4.00	5%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.4	Asset performance is assessed against target levels of service to predict 'failure time'.	3.00	4.00	5%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.5	The agency uses interview of maintenance personnel and operators to actively bring them into the capability planning and implementation process.	4.00	4.00	0%
2	Strategic Planning Processes	2.2	Strategic Failure Prediction	2.2.6	Failure prediction for critical assets is particularly robust.	3.00	4.00	5%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.1	The agency determines projected failure frequency for assets with a failure history from failure records or other available sources. The agency determines the projected failure frequency for assets without a failure history from condition assessment where justifiable, or by degradation (life cycle) modelling.	2.00	3.00	5%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.2	The agency has identified failure modes to a resolution facilitating replacement or rehabilitation decisions.	2.00	3.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.3	The agency has documented failure modes in failure mode libraries to facilitate future failure modes and effects analysis.	1.00	3.00	5%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.4	The organisation identifies the consequences of failure of its assets	3.00	4.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.5	The agency assesses the likelihood of failure of the degraded and critical assets.	3.00	4.00	4%
2	Strategic Planning Processes	2.3	Tactical Failure Prediction	2.3.6	The organisation determines the risk posed by a degraded and critical asset should it fail and a record is kept.	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.1	The agency renewal decision process is documented.	3.00	4.00	5%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.2	The agency has a program of end of economic life rehabilitation / replacement projects based on economic, social and environmental considerations (including physical, capacity and level of service risk).	4.00	4.00	0%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.3	The organisation uses generic class asset class or asset cohort deterioration models for determining future renewal	3.00	4.00	4%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.4	The organisation uses individual asset end of life projection based on degradation modelling and failure consequence	3.00	3.00	0%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.5	The organisation regularly monitors the condition and/or risk of an asset to update the priority and timing of assets to be renewed prior to failure.	4.00	4.00	0%
2	Strategic Planning Processes	2.4	Renewals Planning	2.4.6	The agency projects capital expenditure for asset replacement.	4.00	5.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.1	Organisation-wide risk management framework developed, understood and established across the organisation. Framework consistent with ISO 31000. Common risk criteria are used for categorizing risk for all business units in the organization.	5.00	5.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.2	Risk thresholds developed with clear linkage to strategic goals, legislative requirements, stakeholder needs and industry practice	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.3	Corporate risk policy in place, clearly identifying corporate and other objectives against which risk will be assessed.	4.00	4.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.4	The agency undertakes risk analysis to identify, quantify and document risk consistent with ISO 31000. The organisation considers internal and external risk and opportunities. Sound processes in place to determine internal and external issues relevant to organisation's purpose that can impact on its ability to achieve the intended outcomes of its AM system	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.5	Risks have been identified and are recorded at a level of detail appropriate to the risk exposure. Risks consider all phases of the asset lifecycle.	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.6	The organisation has prepared a business risk profile, including a network risk and resilience profile.	2.00	4.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.7	Interdependencies (including interdependencies with other utilities) assessed in a systematic manner	3.00	4.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.8	The organisation actively participates in Lifelines groups	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.9	Risk mitigation is actively undertaken. Risk management strategies developed with clear actions linked to risk severity following ALARP principles where appropriate	3.00	4.00	3%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.10	Risk treatment options developed systematically with consideration of benefits and costs following ALARP principles where appropriate	4.00	4.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.11	Risk analysis includes ensuring that the agency is not "over-controlled" for the risks it faces	1.00	3.00	2%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.12	Risk analysis includes assessing the risk associated with failure of risk controls	2.00	3.00	1%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.13	The organisation has a formal and ongoing process for review of business context, risk identification and management. Procedures in place to update risk register and policy for those risks not previously identified, where impacts may change or where current or future changes in the organisations operating environment affect risk.	3.00	3.00	0%
2	Strategic Planning Processes	2.5	Risk Management Strategy	2.5.14	The organisation audits the risk management procedure for suitability and effectiveness.	2.00	3.00	1%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.1	Different stakeholder groups and expectations/needs identified, and reviewed regularly to identify new stakeholders and emerging/changing needs.	3.00	4.00	5%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.2	Risks and their management are regularly reported to all appropriate stakeholders. Specifically includes monitoring and reporting on changes to the risk profile and on risks that exceed a defined risk level	3.00	4.00	5%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.3	Risks including outage-related levels of service, reviewed regularly, involving stakeholder consultation and feedback. Stakeholder tolerances tested and confirmed	2.00	3.00	4%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.4	Risks including outage-related level of service reviews, include costed options and take account of customer 'willingness to pay'.	1.00	3.00	9%
2	Strategic Planning Processes	2.6	Risk Management Consultation	2.6.5	Customer input is sought to predict future changes in outage-related LOS from changing customer trends and legislative changes.	1.00	3.00	9%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.1	Risk integral to organisations decision-making.	3.00	4.00	6%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.2	Risk quantified on basis of likelihood and consequences for tangible and intangible risk. The agency assesses the consequences of failure on a triple bottom line basis. The consequences are assessed in terms of dollars or dollar equivalents so that risk can be treated as a cost in decision making.	3.00	4.00	5%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.4	Risk mitigation options (projects) to address all predicted risks over the specified thresholds have been identified.	3.00	4.00	5%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.5	Projects have been selected and prioritised based on lifecycle cost and TBL analysis consistently across all activity areas.	3.00	4.00	5%
2	Strategic Planning Processes	2.7	Risk Management Decision Making	2.7.6	The agency includes stakeholder liaison for social, economic and environmental factors as part of the options analysis.	2.00	3.00	3%
3	Asset Management Practices	3.1	Design Processes	3.1.1	Documented design/construction standards exist and are regularly updated considering TBL aspects and past performance with operator and maintainer input.	4.00	4.00	0%
3	Asset Management Practices	3.1	Design Processes	3.1.2	Documented design/construction standards are routinely used for asset design.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.1	The organisation uses formal acceptance procedures to ensure that equipment is built physically according to specification.	3.00	4.00	8%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.2	The organisation uses formal acceptance procedures to ensure that equipment performs to the functional specification.	3.00	4.00	8%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.3	The organisation has acceptance procedures for the technical information package comprising: drawings; operating manuals; equipment/product lists and specifications; maintenance manuals; operational software listings; and costs.	3.00	4.00	6%
3	Asset Management Practices	3.2	Asset Acceptance Processes	3.2.4	The agency provides necessary training to personnel managing, operating or maintaining the new or modified asset prior to acceptance of the asset.	3.00	3.00	0%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.1	O & M strategy is risk-focused and optimises reactive, preventative maintenance and renewals options.	3.00	4.00	10%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.2	Documented maintenance policies for assets covering both planned and unplanned activities that outline overall maintenance objectives and strategies.	3.00	4.00	8%
3	Asset Management Practices	3.3	O & M Strategy and Analysis	3.3.3	Analysis to determine cause of failures and to prevent recurrence.	3.00	3.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.1	Operations and maintenance procedures manuals are available for all plant and mechanical assets in appropriate form.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.2	Processes in place to ensure that the manuals are kept up to date.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.3	The agency has a quality procedure from the time of acceptance, that is implemented and followed ensuring change to asset configuration is managed throughout the utilisation phase of the asset life, such that at any given time the technical records are representative of the physical assets.	3.00	3.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.4	The agency has effected an operational risk identification program and has documented the results.	3.00	4.00	3%
3	Asset Management Practices	3.4	O & M Plans	3.4.5	The agency has undertaken formal analysis on the basis of likelihood and consequence and the cost of managing the risk. This has resulted in a prioritised operational risk mitigation program.	3.00	4.00	3%
3	Asset Management Practices	3.4	O & M Plans	3.4.6	The agency addresses operational risks identified for action in a timely and controlled manner, either by implementation of physical changes or through operating procedural initiatives.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.7	The organisation has a Safety Management System in accordance with NZS 7901:2014 and AS/NZS 2885.6:2018	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.8	Procedures in place for rapid and structured response to emergency failures. These procedures are regularly tested and reviewed. Maintenance plans have specific plans for critical events and critical asset failures.	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.9	The agency audits to ensure adequate treatment of risks, and to identify new operational risks.	3.00	4.00	1%
3	Asset Management Practices	3.4	O & M Plans	3.4.10	The organisation has a process or procedure that captures and integrates the outcomes of incidents or emergencies into the O&M Plans or RM Plans	4.00	4.00	0%
3	Asset Management Practices	3.4	O & M Plans	3.4.11	Formal emergency response plans and business continuity plans developed and periodically tested and reviewed	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.1	The agency has an understanding of the principles of failure modes and effects analysis.	2.00	3.00	2%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.2	The agency has identified failure modes to a resolution suitable for the management of its maintenance	2.00	3.00	2%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.3	The agency records failure modes in failure mode libraries to facilitate future analysis.	1.00	3.00	2%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.4	The agency has a risk analysis procedure quantifying maintenance and operations risk	3.00	4.00	3%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.5	The organisation calculates risk for each failure mode and a record is held against the asset or equipment. Risk is based on consequence for each failure mode and likelihood in terms of projected frequency of each failure mode, either from historical performance, published reliability data or from statistical or physical condition degradation models.	3.00	3.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
3	Asset Management Practices	3.5	Maintenance Execution	3.5.6	The agency identifies high consequence assets and these are considered for preventive maintenance	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.7	The organisation requires operators to develop failure contingency plans where for high consequence assets, preventive maintenance is considered unjustifiable because of low likelihood of failure.	3.00	4.00	3%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.8	The agency maintenance management strategy comprises a "roll up" of the maintenance targeting each failure mode.	3.00	3.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.9	The agency has planned and unplanned maintenance procedures. These are readily available to maintenance personnel for both planned and unplanned situations.	5.00	5.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.10	The agency generates a record of maintenance task non-performance backlog by which "catch up" maintenance is managed.	4.00	4.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.11	The agency regularly reviews records of maintenance task non performance and addresses these through strategy, management or workforce changes.	3.00	3.00	0%
3	Asset Management Practices	3.5	Maintenance Execution	3.5.12	The agency changes maintenance procedures as a result of root cause analysis of equipment failures to prevent recurrence.	3.00	3.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
4	Information Systems	4.1	Asset Register System	4.1.1	Asset register is flexible and allows definition and recording recording of all needed asset types and attributes.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.2	Asset register has suitable reporting capabilities available - can be third party or through use of BI tools etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.3	Asset register can be interfaced / integrated with other business systems e.g through use of API's and web services etc.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.4	Asset register is accessible (locally and remotely) and 'user friendly'.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.5	Asset register supports changeable hierarchical definition of assets and data can be grouped at alternative levels.	5.00	5.00	0%
4	Information Systems	4.1	Asset Register System	4.1.6	Uses an audit trail to track changes to asset data.	4.00	5.00	1%
4	Information Systems	4.1	Asset Register System	4.1.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.1	GIS holds appropriate spatial representation of assets.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.2	GIS is linked to asset register for access to underlying asset attribute data.	3.00	4.00	4%
4	Information Systems	4.2	Geographic Information System	4.2.3	GIS provides validation checks and tools to ensure data integrity is maintained between the GIS and asset register .	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.4	Plans and records in a suitable form, readily available, accessible and current.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.5	All new works recorded in system as 'asbuilts'.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.6	GIS is 'user-friendly' and readily accessible to all staff.	5.00	5.00	0%
4	Information Systems	4.2	Geographic Information System	4.2.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.1	System available to manage requests relating to complaints and observations by both public and staff with regard to the performance or failure of assets	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.2	System records all the necessary details relating to the service request including customer/staff contact details	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.3	System is linked to asset register and/or maintenance management system so that remedial works can be linked to assets	3.00	4.00	4%
4	Information Systems	4.3	Customer Service System	4.3.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.3	Customer Service System	4.3.5	System can capture remedial works data for assets including costs, appropriate for AM analysis.	3.00	4.00	4%
4	Information Systems	4.3	Customer Service System	4.3.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.1	System available to manage work orders / work requests	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.2	System can capture historic cost data for assets, appropriate for AM analysis.	2.00	4.00	9%
4	Information Systems	4.4	Maintenance Management System	4.4.3	System can capture works data for assets, appropriate for AM analysis.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.4	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.4	Maintenance Management System	4.4.5	System is linked to asset register so that maintenance actitivity is directly linked to assets and supports the validation of asset attribute data.	2.00	5.00	12%
4	Information Systems	4.4	Maintenance Management System	4.4.6	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.1	System available to manage condition gradings and accommodates industry recognised condition grading scales appropriate for the variety of assets that need regular monitoring.	4.00	5.00	5%
4	Information Systems	4.5	Condition Monitoring System	4.5.2	System is linked to the asset register so that condition grades directly relate to assets.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.3	System is user-friendly and accessible to staff and contractors as required.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.4	System can interface with or export data for use with other third party analytical software.	5.00	5.00	0%
4	Information Systems	4.5	Condition Monitoring System	4.5.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.6	SCADA System	4.6.1	SCADA system is used to monitor and control operations on the network.	3.00	3.00	0%
4	Information Systems	4.6	SCADA System	4.6.2	SCADA System is linked to other systems such as maintenance management.	2.00	3.00	4%
4	Information Systems	4.6	SCADA System	4.6.3	System is user-friendly and accessible to staff and contractors as required.	3.00	3.00	0%
4	Information Systems	4.6	SCADA System	4.6.4	System can interface with or export data for use with other third party analytical software.	2.00	3.00	3%
4	Information Systems	4.6	SCADA System	4.6.5	Staff use system and system functionality as appropriate for their role.	3.00	3.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.1	Models available to determine timing of failure with respect to capacity.	4.00	5.00	4%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.2	Models available to determine asset capacity.	4.00	5.00	4%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.3	Models accurately represent assets.	4.00	5.00	2%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.4	Models are user-friendly, robust and accessible.	5.00	5.00	0%
4	Information Systems	4.7	Capacity / Utilisation Models	4.7.5	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.1	System allows the defintion and identification of failure events / modes.	3.00	4.00	4%
4	Information Systems	4.8	Advanced RM Systems	4.8.2	System allows the defintion and identification of consequences of physical failure and failure to deliver LOS in point and $ terms.	4.00	4.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.3	System allows the identification of probability of failure for each event / mode	3.00	4.00	4%
4	Information Systems	4.8	Advanced RM Systems	4.8.4	System can calculate a risk score (rating) and risk cost for assets or facilities.	3.00	4.00	4%
4	Information Systems	4.8	Advanced RM Systems	4.8.5	System can rank assets in terms of criticality	3.00	4.00	4%
4	Information Systems	4.8	Advanced RM Systems	4.8.6	System is user-friendly and accessible.	5.00	5.00	0%
4	Information Systems	4.8	Advanced RM Systems	4.8.7	Staff use system and system functionality as appropriate for their role.	5.00	5.00	0%

Category	Category Description	Element	Element Description	Criteria Code	Criteria	Current Rating	Appropriate Rating	Gap
5	Organisational Tactics	5.1	RM Improvement	5.1.1	Staff place high priority on completing RM improvements.	3.00	4.00	3%
5	Organisational Tactics	5.1	RM Improvement	5.1.2	Process in place for regularly monitoring improvement plan progress.	3.00	4.00	5%
5	Organisational Tactics	5.1	RM Improvement	5.1.3	Independent audits undertaken to identify improvements.	2.00	2.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.4	Improvement plan updated annually.	3.00	4.00	3%
5	Organisational Tactics	5.1	RM Improvement	5.1.5	RM improvements from last review/plan completed as per programme.	3.00	3.00	0%
5	Organisational Tactics	5.1	RM Improvement	5.1.6	The utility undertakes routine self-assessment and formalized benchmarking to compare and continually improve its practice and performance.	2.00	3.00	4%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.1	The organisation undertakes an assessment determining whether it should hold spares and consumables in stock.	4.00	4.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.2	Organisation ensures that core network information is 'owned' and retained in-house.	4.00	4.00	0%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.3	Organisation assesses risks associated with outsourced activities and ensures that risks are identified, assessed and adequately controlled in keeping with its risk management framework	3.00	4.00	5%
5	Organisational Tactics	5.2	Commercial Tactics	5.2.4	Formal quality system in place	3.00	3.00	0%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.1	Board and senior managers approve RM plan regularly (at least annually).	3.00	4.00	6%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.2	Board and senior managers consulted during RM plan development.	3.00	4.00	6%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.3	Adequate resources available for RM plan development. A sense of urgency exists within the organization to continue to establish and improve its level of practice around RM.	4.00	4.00	0%
5	Organisational Tactics	5.3	Corporate Sponsorship and Commitment	5.3.4	Corporate teams with appropriate RM skills, direction and staffing, working collaboratively across functions to deliver improvements in RM.	4.00	4.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.1	RM roles and responsibilities clearly defined and documented in all organisational units (including documentation in Position Descriptions).	3.00	4.00	6%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.2	There is alignment and understanding at the senior level and agreement of roles/responsibilities and how they support each other.	3.00	4.00	3%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.3	Planning in place to minimise risks relating to loss of key staff knowledge.	4.00	4.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.4	Specified staff responsible for ensuring that procedures and documentation are up to date and reflect current practice and policies.	5.00	5.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.5	Staff are informed & aware of risk procedures and policies and their own risk management responsibilities.	4.00	4.00	0%
5	Organisational Tactics	5.4	RM Responsibilities	5.4.6	Risk management plans are developed with input from staff at all levels of asset management processes.	3.00	4.00	6%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.1	Required RM competencies identified and organisational capability systematically assessed specifically identifying skill gaps.	3.00	3.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.2	Staff regularly attend workshops as appropriate to close skill gaps.	4.00	4.00	0%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.3	Knowledge sharing and exchange of personnel is used to foster RM principles and practices.	3.00	4.00	5%
5	Organisational Tactics	5.5	RM Training & Skills	5.5.4	Level of RM expertise is appropriate to each job.	4.00	4.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.2	Organisation monitors possible legislative changes or changes in standards that may have an impact on its operations or policies.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.1	Organisational and commercial tactics & RM strategy reviewed to incorporate changes in regulations and standards.	5.00	5.00	0%
5	Organisational Tactics	5.6	Legislative Compliance	5.6.3	Organisation informs staff of legislative changes affecting their work.	5.00	5.00	0%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.1	The organisation understands its organisational resilience through a structured assessment using industry-accepted frameworks/tools (e.g. OrgResTool)	3.00	3.00	0%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.2	The organisation has an organisational resilience strategy in place which is actively implemented	3.00	3.00	0%
5	Organisational Tactics	5.7	Organisational Resilience	5.7.3	The organisational resilience strategy is regularly reviewed and progress monitored/reported as appropriate	3.00	3.00	0%

Appendix F

Assessment Scoring Table

Appendix F   Assessment Scoring Table

Rating	%	Description	Process	Information Systems	Asset Knowledge (Data and plans)
1	0	Innocence	No process exists. Never do this.	No system exists	No results seen. No confidence in information. Planning based on very large unsupported assumptions.
2	25	Awareness	Minimal documentation. Ad hoc procedures. Occasionally do this.	Manual system exists or plans for automated systems are in place. Some very basic user needs met.	Minimal results, long way to go. Very low data confidence.
3	45	Systematic Approach	Semi formal process. Completed on an as-needed basis for critical programs and activities.	Automated system exists. Basic user needs met.	Some results, still below expectations. Low data confidence.
4	70	Good	Formal process exists and documented but still evolving. Often do this on many programs.	Good system in place. Widely available. All key user needs met.	Good results, getting there. Reasonable data confidence.
5	85	Excellence	Formal documented process, well tested and followed. Usually do this, omitted only in exceptional circumstances.	Strong system in place. Nearly all user needs met.	Excellent results, still some room to improve. Specialists used Good level of data confidence.
6	100	Best Possible	Strictly formal process. Always do this, standard operating procedure. Process heavily emphasised, not deviated from.	State-of-the-art system in place. All user needs met.	Unparalled results; a total success. International experts used Very high level of data confidence.

Appendix G

Acronyms

Appendix G   Acronyms

The following table lists the commonly used acronyms in this report:

Acronym	Description
AM	Asset management
AMP	Asset management plan
FGL	First Gas Limited
FGL-DTR	First Gas Limited - Distribution
FGL-TR	First Gas Limited - Transmission
FMEA	Failure modes and effects analysis
FMECA	Failure modes, effects and criticality analysis
GIS	Geographic information system
GPB	Gas pipeline business
O&M	Operations and maintenance
RM	Risk management
SCADA	Supervisory control and data acquisition

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