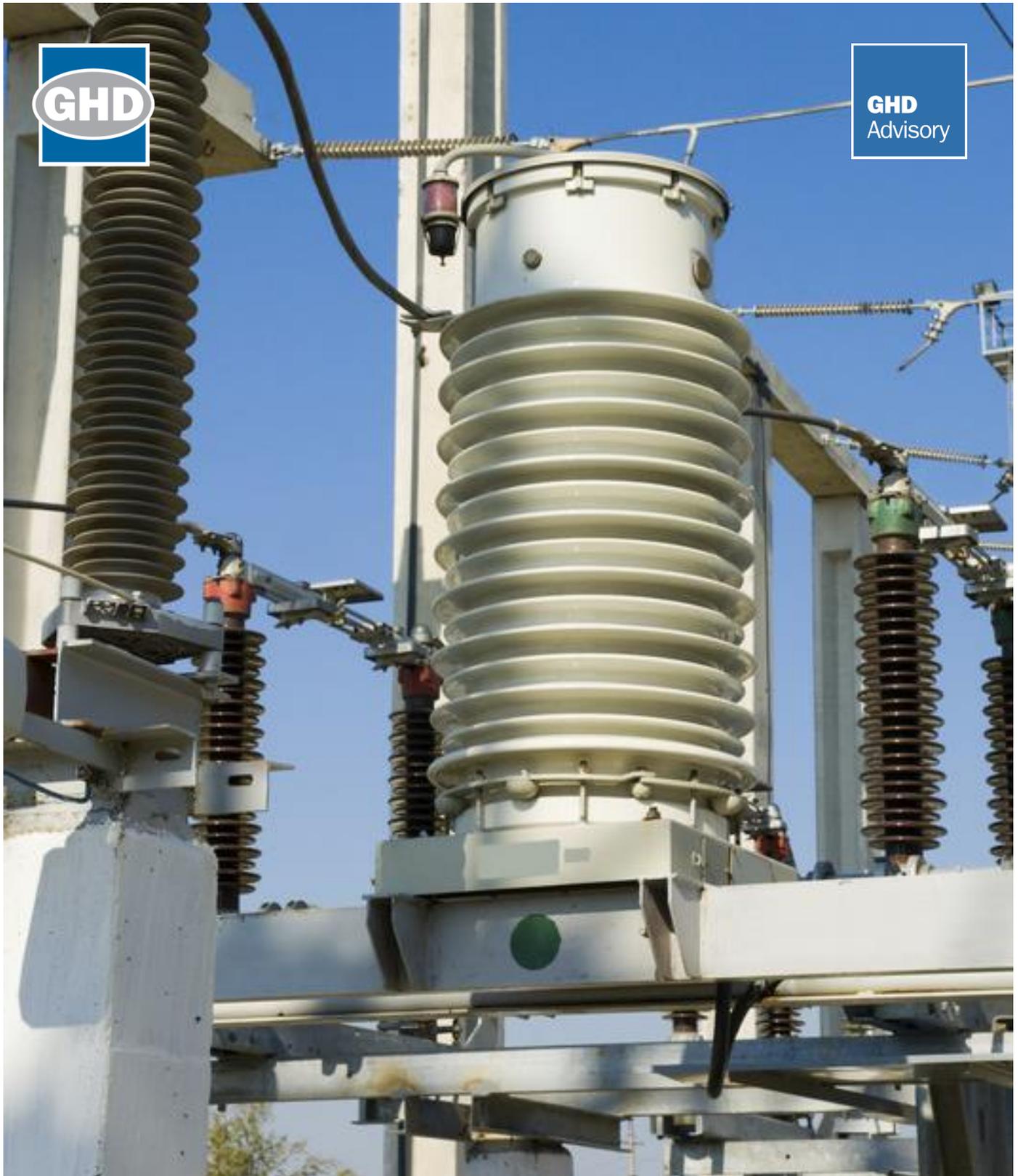




GHD
Advisory



ActewAGL Distribution

Asset Management Maturity Assessment

April 2017

Executive summary

Asset management maturity assessment

GHD was engaged by ActewAGL Distribution (AAD) to undertake an Asset Management (AM) maturity assessment in accordance with the scope and limitations outlined in Section 1 and the assumptions and qualifications contained throughout the report.

The Maturity Assessment consisted of two days of workshops in Canberra, followed up by documentation gathering and analysis, and a number of one-on-one interviews with key personnel.

The workshops used the GHD TEAMQF-3g tool to collate and analyse responses to 268 questions across a range of AM categories.

Results

The results were analysed and a score calculated for AAD as a whole. The overall score was **80%** which is at the high end of 'Enterprising', indicating mature asset management performance.

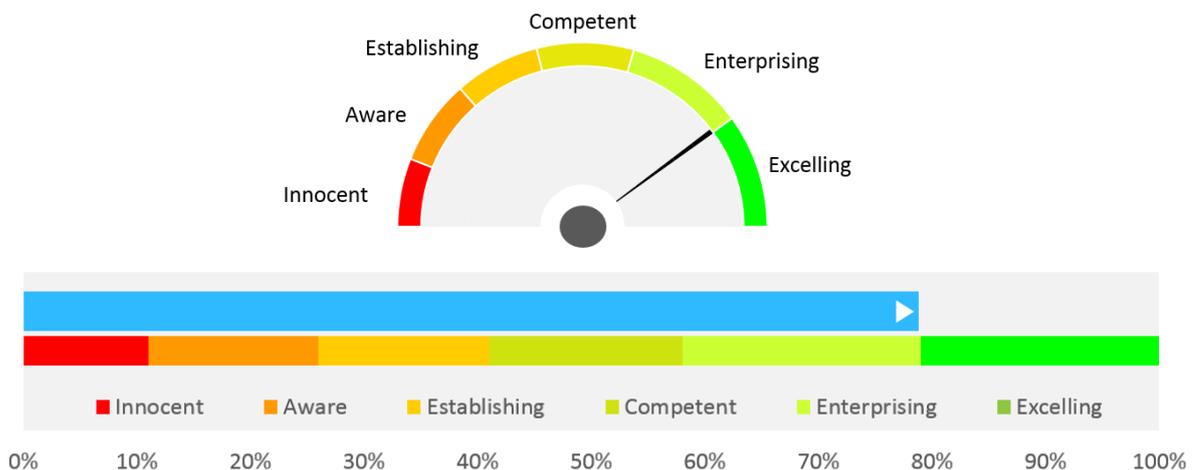


Figure 1 ActewAGL Distribution Maturity Score 80% Enterprising

The body of the report considers the results across the organisation in more detail with scores calculated for different AM elements and categories.

The results of the assessment were also scored against the clauses of the ISO 55001 standard.

ISO 55001 Scoring

The scoring of questions against ISO 55001 indicate that AAD understands the importance of AM as its core business. They have established AM roles and responsibilities; management have committed to achieving best practice; and they have excellent documentation and planning capabilities. However, there are gaps in how this is communicated and valued throughout the organisation. There is room to improve on the level of detail of the asset specific plans and how the business is defining and meeting its objectives throughout the business.

Figure 2 shows the level of maturity to meet the ISO standard. The level of competence is set at 52% which is equivalent to a weighted average rating for each question addressing that particular clause of “Competent with Some Minor Non-Conformances”.

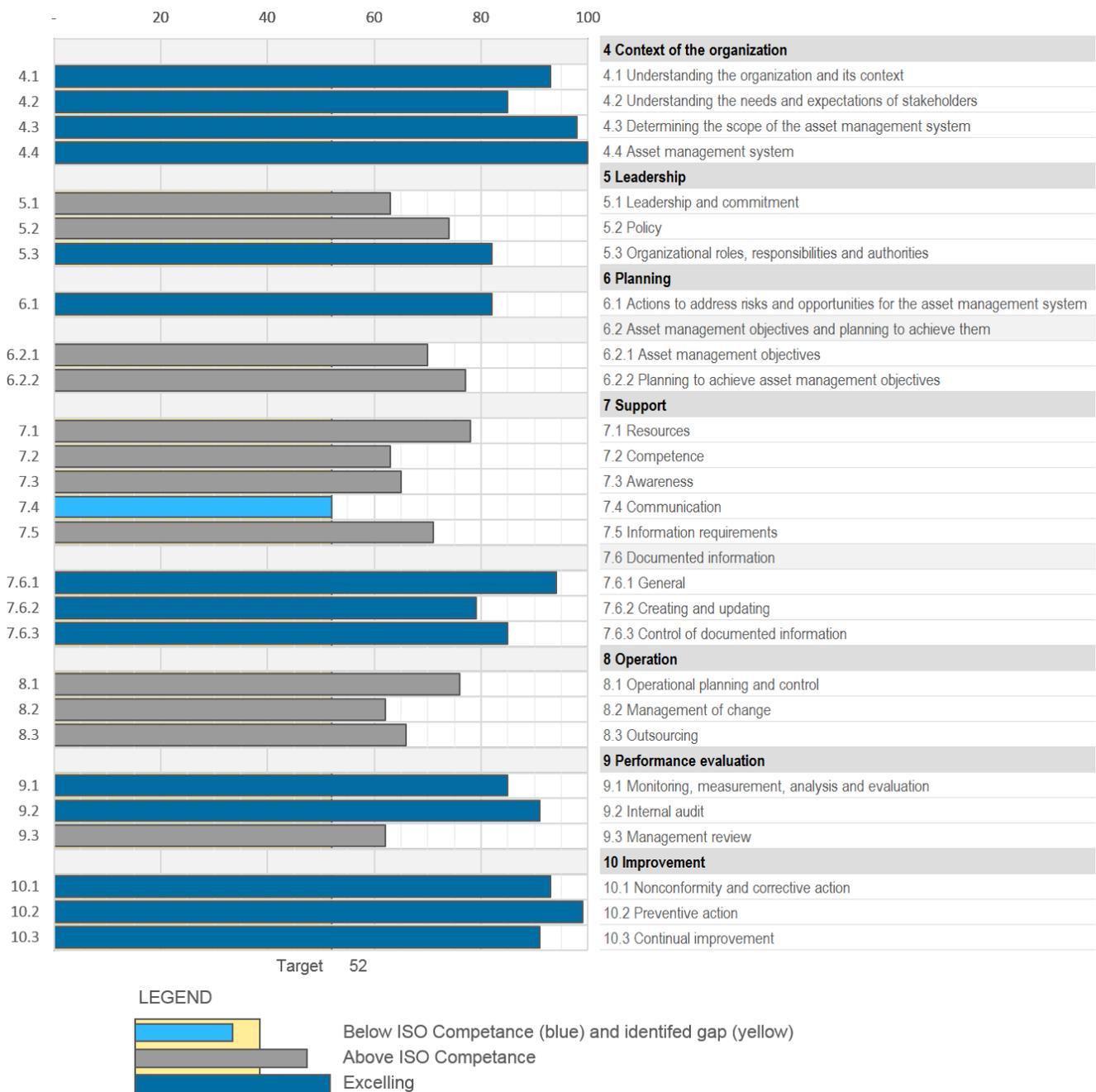


Figure 2 ActewAGL Distribution scoring results against ISO55000.

Improvement Plan

The improvement plan aims to raise the awareness where AAD have gaps or misalignments in the execution or communication within the asset management framework. Over the past four years annual maturity assessments have been completed to check if the asset management progress has been keeping pace with the original AM software implementation program.

The following assessment have provided the program momentum towards alignment with the ISO standard:

- 2014, AMCL Maturity Assessment, (see Figure 9)
- 2015, IAM Self Assessment Tool
- 2016, Asset Management Customer Value project (WSAA)
- 2017, IAM Self Assessment Tool

The main improvement actions requiring attention include:

- I. **Re-establish AM Steering Committee.** This is seen as a key communication group to provide ongoing monitoring and improvement planning of the asset management system. The Steering Committee will certify that the AM system becomes more fully integrated into the business, and that AM objectives and benefits are effectively documented and actively communicated and understood throughout the organisation. Recommendations for future upgrades to systems, best practice processes and organisational roles and responsibilities to make sure the AM system progresses on a path of continuous improvement should be ratified by this committee.
- II. **Standardise AM activities and consolidate meaningful data.** AAD generates a large quantity of generic data, including condition assessments, work management cost data, and feedback from maintenance activities. Generating reports from this information is difficult as it is not consistent. By standardising activities and linking to AM objectives and common criteria, AAD can improve visibility and see where objectives are being met. More targeted data matched to objectives will allow for more complex analyses, including FMEA analysis.
- III. **Integrate standardised activities across the business.** The nature of AAD's structure and incomplete integration of systems creates silos within the teams. With activities mapped across the whole business, the benefits of end-to-end visibility can be measured. Work here includes Completion of Program of Work integrations, 'Actual Costs' integration, linking of documents to standardised activities, processes for improving unit assemblies and building BAU capabilities for creating assemblies, automatic publishing of data to the GIS in line with the required standard. This is vital for continuous and consistent improvement of ActewAGL's asset data and knowledge.
- IV. **Install a Business Intelligence (BI) solution, including a consolidated Data Warehouse or Data Store.** This would allow AAD to move beyond limited operational intelligence, into predicting asset performance, capacity, utilisation, failure and costing. A consolidated data solution is required for combining the benefits of broad standardised data covering all asset classes, with more detailed analytics for critical classes. Quality data is the baseline for scenario planning and options modelling capabilities; leveraging historical data to control future data. This capability would allow for sharing and capitalising on other utilities' asset data for the same asset classes. A solid BI framework also opens up the possibility of modelling other parts of the business for efficiency. Critically, it also provides assurance of the AM system as a whole; providing a platform for visibility of the business of specific ISO 55001 requirements for internal audit of adherence to process.

Overall, the improvement of communication and data completeness (and consistent standards for data) will open up opportunities for AAD to develop more detailed lifecycle costs of assets and make more informed decisions regarding their management.

Table of contents

1.	Introduction.....	1
1.1	Background.....	1
1.2	Purpose of this report.....	1
1.3	Scope and limitations.....	1
2.	Methodology.....	2
2.1	Evaluation Against Best Appropriate Practice in Asset Management.....	2
3.	Findings.....	4
3.1	Overview across the Organisation.....	4
4.	Certification Advice.....	10
4.1	Preparation.....	10
4.2	Business Benefits.....	10
4.3	Estimated Certification Costs.....	11
5.	Continuous Improvement.....	12
5.1	Advanced Asset Management.....	12
5.2	Improvement Plan.....	12
	Appendix A.....	22

Table and figure index

Table 1	Summary Evaluation Methodology.....	2
Table 2	Percentage scores for performance against ISO 55001.....	8
Table 3	Improvement Plan.....	13
Figure 1	ActewAGL Distribution Maturity Score 80% Enterprising.....	i
Figure 2	ActewAGL Distribution scoring results against ISO55000.....	ii
Figure 3	TEAMQF-3g © Conceptual Model.....	3
Figure 4	TEAMQF-3g Summary by Category.....	4
Figure 5	Overall Rating of AM Elements.....	5
Figure 6	Overall Rating of AM Elements.....	7
Figure 7	ISO 55001:2014 Performance comparison to previous assessments.....	9
Figure 8	Improvement tasks infographic.....	20

1. Introduction

1.1 Background

ActewAGL Distribution (AAD) is responsible for the safe and reliable delivery of electricity to over 195,000 residential and business customers in the ACT and NSW, across a network area of 2,358 square kilometres. As a regulated business with public holdings, AAD has a responsibility to adhere to a high standard of asset management and reporting, so that its operations are demonstrably efficient and offer value to public and private shareholders.

1.2 Purpose of this report

In March 2017 GHD was requested to undertake a base line study of AAD's current Asset Management (AM) processes and practices. This study forms an initial assessment for ISO 55001 compliance and identifies areas for improvement towards best practice asset management. The purpose of this assessment is to establish the current level of maturity against the requirements of the ISO 55001 standard and to make a qualified determination if AAD should consider achieving full certification.

Another primary deliverable from this report is to determine a prioritised AM improvement program outlining key tasks required to close any identified best practice performance gaps for the continuous improvement of AM within AAD.

1.3 Scope and limitations

This report: has been prepared by GHD for AAD and may only be used and relied on by AAD for the purpose agreed between GHD and AAD as set out in this report.

GHD otherwise disclaims responsibility to any person other than AAD arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by AAD and others who provided information to GHD (at the workshops, interviews and through other correspondence), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Methodology

The approach to the study involved two workshops and a series of interviews with key people involved in the AM process to source relevant information to determine current organisational maturity level relative to a number of asset management quality elements. These elements are outlined in GHD's Total Enterprise Asset Management Quality Framework (TEAMQF 3G) Gap: id tool, which include quality assessments against requirements of the ISO standards 55000, 55001 and 55002.

The three Standards are:

- ISO 55000 Asset management - Overview, Principles and Terminology
- ISO 55001 Asset management - Management Systems - Requirements
- ISO 55002 Asset management - Management Systems Guidelines on the application of ISO 55001

The evaluation process included seeking workshop responses to a series of standard questions relating to each topic area. The process is essentially a self-evaluation by relevant staff attending the workshops as well as some limited validation follow up via individual interviews with selected staff. Additional analysis was performed through documentation gathering, identifying accessibility of the relevant policies, strategies, processes and reporting artefacts to the organisation's own staff.

The steps in the evaluation and program development process are outlined in Table 1 below.

Table 1 Summary Evaluation Methodology

Evaluation Methodology	
Identify Gaps	<p>Generally review asset management against best appropriate practice:</p> <ul style="list-style-type: none"> – Assessment against ISO 55000 standard – Assessment of processes and practices – Assessment of information systems – Assessment of data and knowledge – Assessment of organisational issues – Assessment of people issues – Assessment of service delivery – Assessment of asset management plans.
Prepare Draft Report	<ul style="list-style-type: none"> • First draft circulated for comment
Feedback	<ul style="list-style-type: none"> • Receipt of feedback from draft
Complete Report	<ul style="list-style-type: none"> • Revision and review of draft report in light of feedback • Production of final report.

2.1 Evaluation Against Best Appropriate Practice in Asset Management

GHD's TEAMQF-3g © asset management evaluation process has evolved over 20 years and goes beyond PAS 55 to look at organisational asset management maturity. It looks at a broader

number of asset management areas that contribute towards enabling robust and industry leading practices. This also incorporates all the requirements of the new ISO 55001.

The TEAMQF-3g © Conceptual Model is shown below.

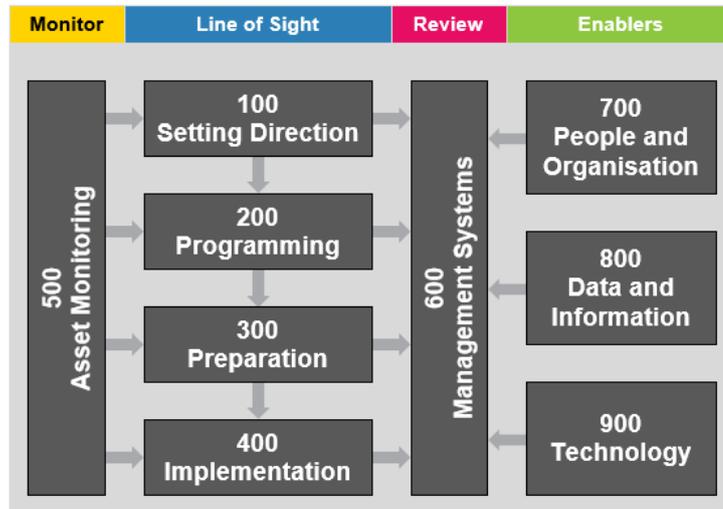


Figure 3 TEAMQF-3g © Conceptual Model

The interviews covered the nine categories of AM from the conceptual model above.

The nine categories are further broken down into the following 35 elements.

- **Setting Direction**

- Asset Management Policy Development
- Asset Management Strategy
- Demand Forecasting
- Setting Asset Management Objectives

- **Programming**

- Accounting and Costing
- Strategic Planning
- Capital Expenditure Evaluation

- **Preparation**

- Maintenance Decision Making
- Asset Management Plans
- Implementation of Asset Management Plans

- **Implementation**

- Operations
- Creation and Acquisition
- Maintenance
- Works Resource Management
- Rationalisation and Disposal

- **Asset Monitoring**

- Asset Condition Monitoring
- Asset Performance Monitoring
- Incident Investigation

- **Management Systems**

- Management System
- Business Risk Management
- Asset Risk Management
- Continuous Improvement
- Legal Regulatory and Other Requirements

- **People and Organisation**

- Organisational Issues
- People Issues
- Commercial
- Communication

- **Data and Information**

- Process for Managing Asset Knowledge
- Asset Data and Knowledge
- Activity Data and Knowledge

- **Technology**

- Information System Issues
- Financial and HR Information Systems
- Asset and Work Management Systems
- Supply and Logistics Information Systems
- Advanced Information Systems

3. Findings

3.1 Overview across the Organisation

AAD recognises the importance of asset management best practice, and has put considerable effort into building policy, strategy and objectives, and has dedicated resources to effectively deliver its asset management strategy.

Analysis of TEAMQF-3g highlighted that AAD excels in Asset Management and is continuously improving.

The AM framework is comprised of 35 elements grouped into the nine key AM categories (refer section 2.1). The summary by category can be used to demonstrate the inter-related areas within the framework where AM practices are good for identifying deficiencies.

AM aspects summarise the scores for different questions within each AM category. For example the People aspect considers all questions that relate the People within the organisation at all stages within the AM framework. The summary by Aspect can be used to identify areas that may be lacking across the AM framework.

3.1.1 Summary by AM category

Individual scores obtained based on responses in workshops and interviews are summarised to the TEAMQF-3g asset management categories providing an overall organisational score.

AAD's overall percentage figure is 80% (Enterprising), refer **Figure 4**.

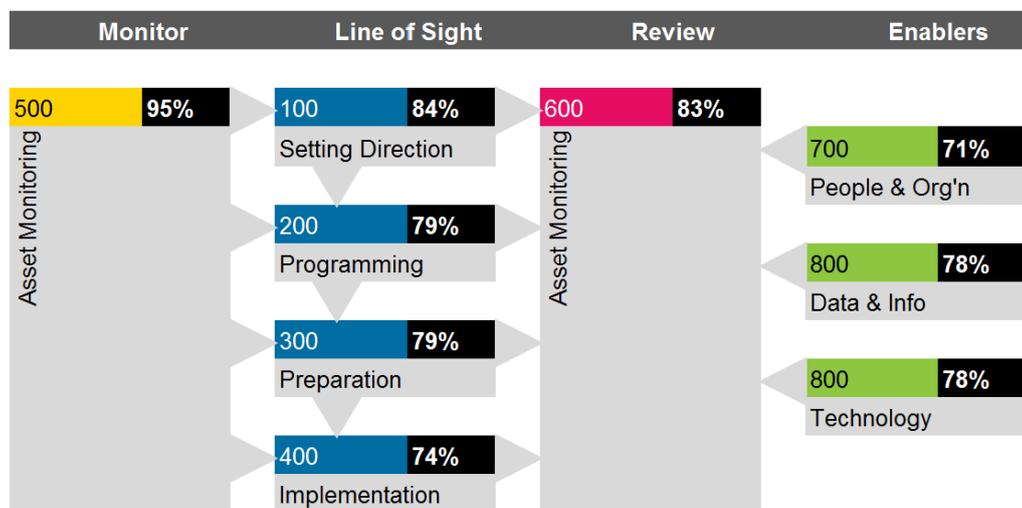


Figure 4 TEAMQF-3g Summary by Category

3.1.2 Summary by AM Element

A summary of the element assessment scores resulting from the workshops and interviews are shown in Figure 5. The scores presented are an average of the scores for each question within that element. Specific outliers are noted below. Summary notes and recommendations for each element are detailed in Table 3. It is important to note that AAD scores with a high level of maturity in every category, so areas for improvement should not be considered to be underperforming areas.

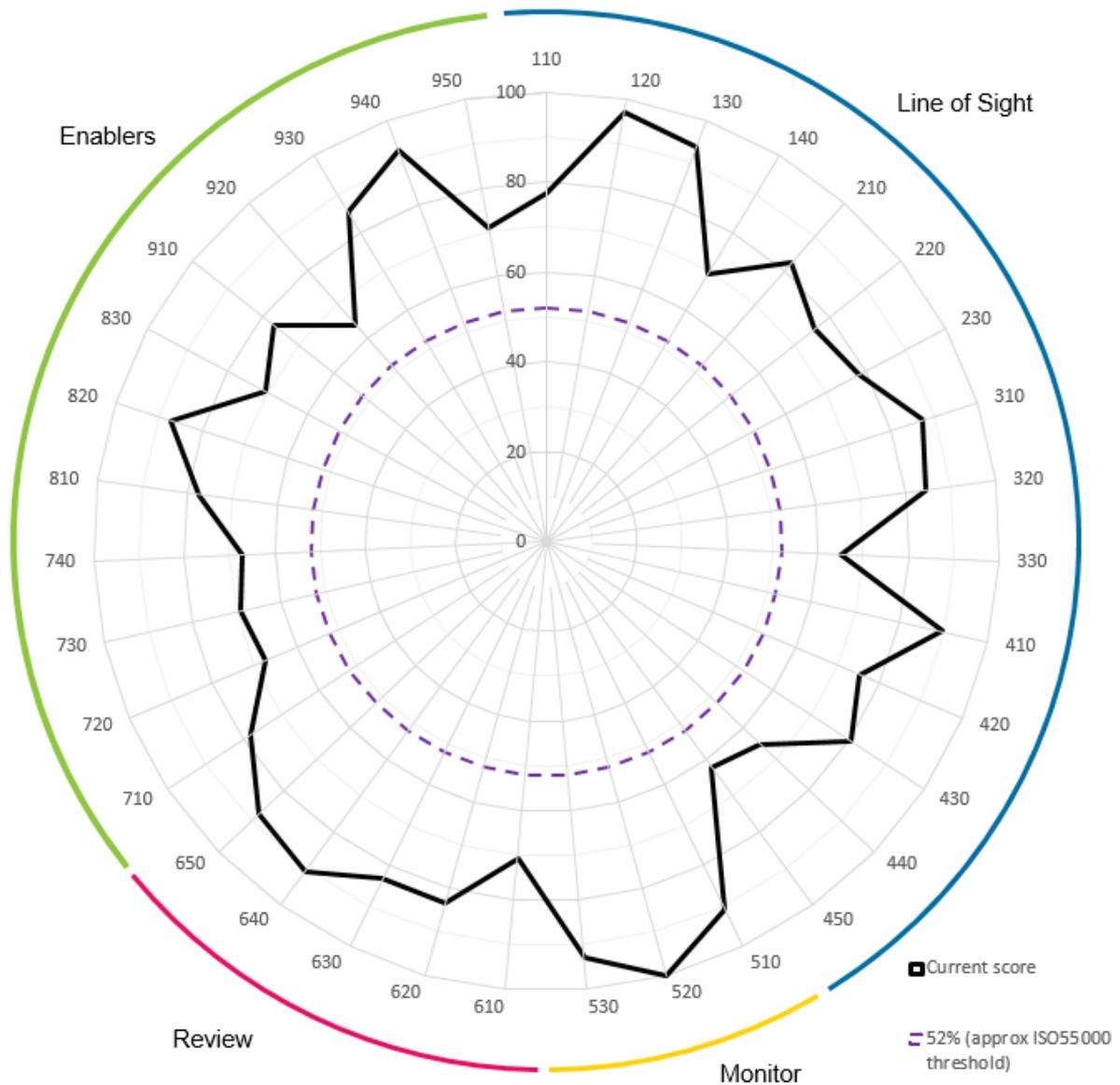


Figure 5 Overall Rating of AM Elements

Line of Sight

ActewAGL have excellent line of sight specifically across elements:

Asset Management Strategy (120), Demand Analysis (130), Maintenance Decision Making (310) and Operations (420).

Areas for improvement are to be found in elements:

Setting Asset Management Objectives (140), Implementation of Asset Management Plans (330), Work and Resource Management (440)

Monitor

Scores here are excellent across the board.

Review

ActewAGL Distribution's review capabilities excel specifically for elements:

Continuous Improvement (640), Legal, Regulatory and other Requirements (650),

Areas for improvement are to be found in elements:

Management System (610)

Enablers

AAD Enablers excel specifically in elements

Asset Data and Knowledge (820), Asset and Work Management Information Systems (930), Supply and Logistic Management Information Systems (940)

Areas for improvement are to be found in elements:

People Issues (720), Commercial (730), Communication (740), Financial and HR information Systems (920), Advanced Information Systems (950)

This figure shows the median score for each section, including the spread of scores within each.

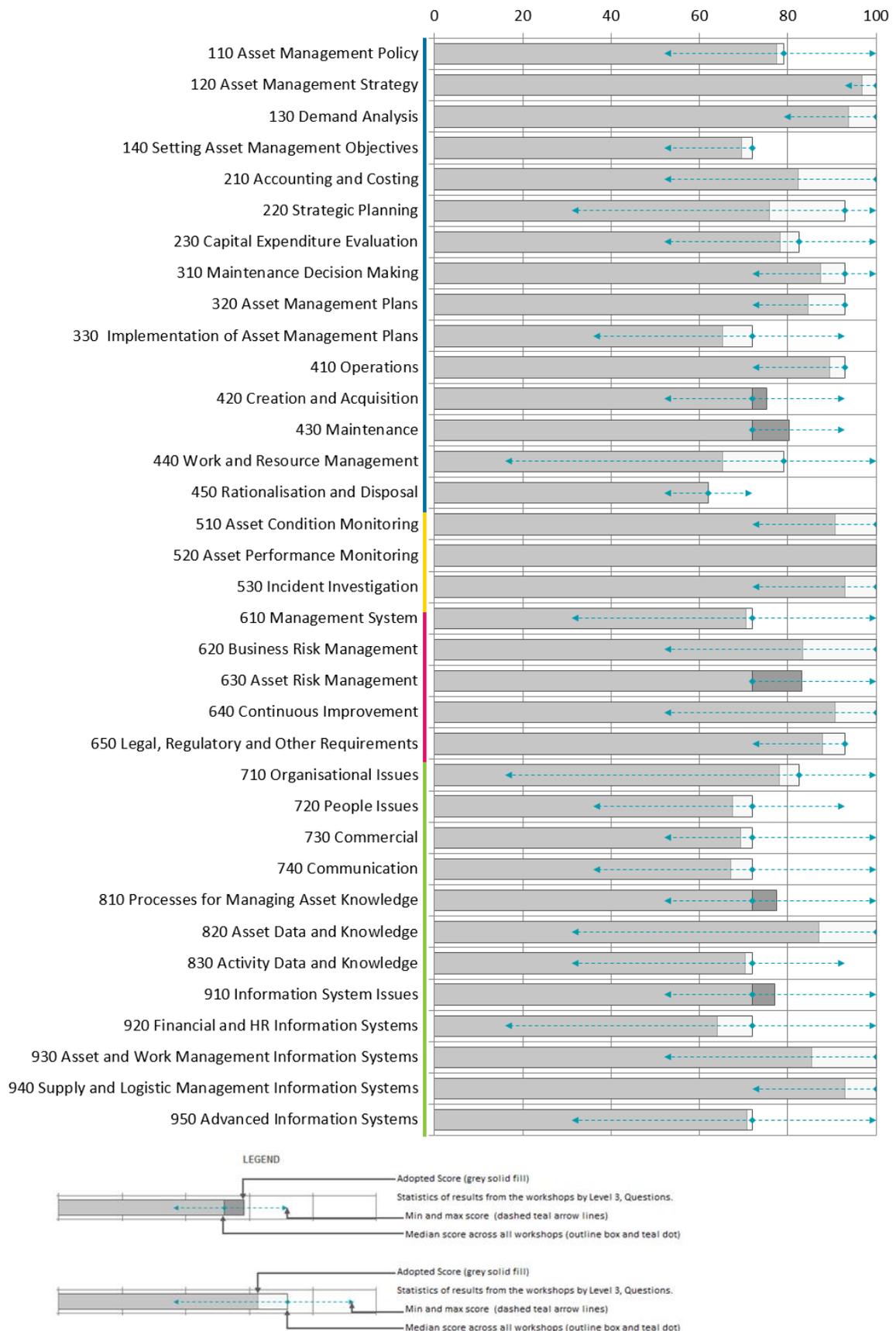


Figure 6 Overall Rating of AM Elements

3.1.3 Summary by ISO 55001:2014

The scores were assessed against the requirements of ISO 55001:2014. The results are shown in Table 2 and presented in Figure 7 where the competence level for ISO is set at 52%. The current performance is matched against the current internal assessment and the original 2014 AMCL assessment, when ActewAGL began its Asset Management improvement program.

The business fully meets the “competency” requirements of the ISO standard based on this assessment.

Areas for focus are on Communication, Management of Change, Leadership and Commitment, Objectives, and Management Review of Performance.

Table 2 Percentage scores for performance against ISO 55001

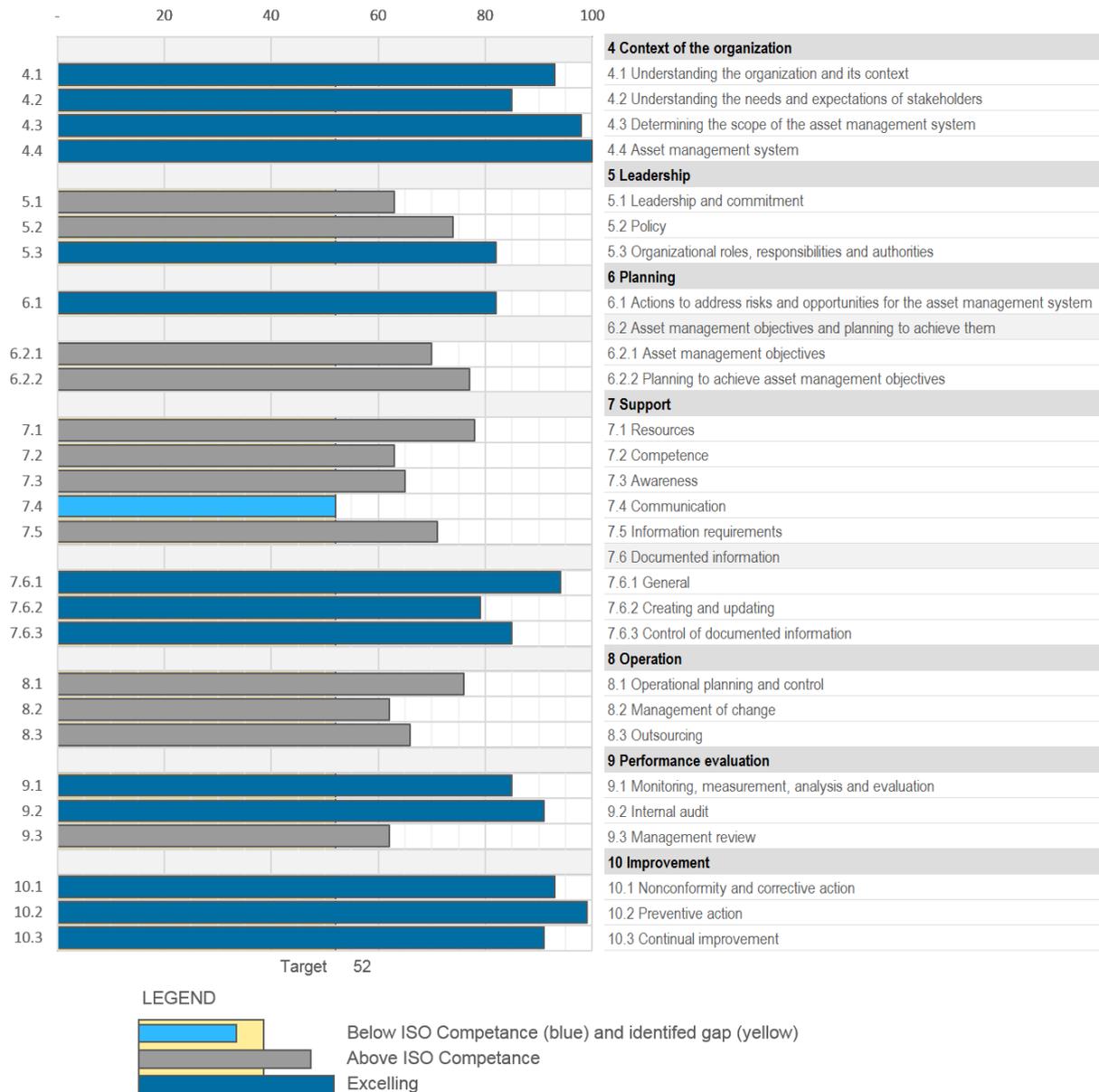


Figure 7 shows a comparison of the current assessment, AMCL's 2014 assessment and ActewAGL's 2015 and 2017 internal assessments. Variations between these assessments should be considered as areas of focus for improvement.

The scoring of the previous assessments and the current GHD assessment are not directly comparable so variations between the scores may be due to differences in assessment approach or translation from one scoring system to the other rather than an actual difference in performance. Current assessment scoring scheme (0L-5H scale) has been rationalised to best approximate the previous assessment scoring (0-3).

Clauses with variations where the Gap:Id scores are higher than internal scores are highlighted in **blue**, and where internal scores are higher than the Gap:Id scores are in **green**.

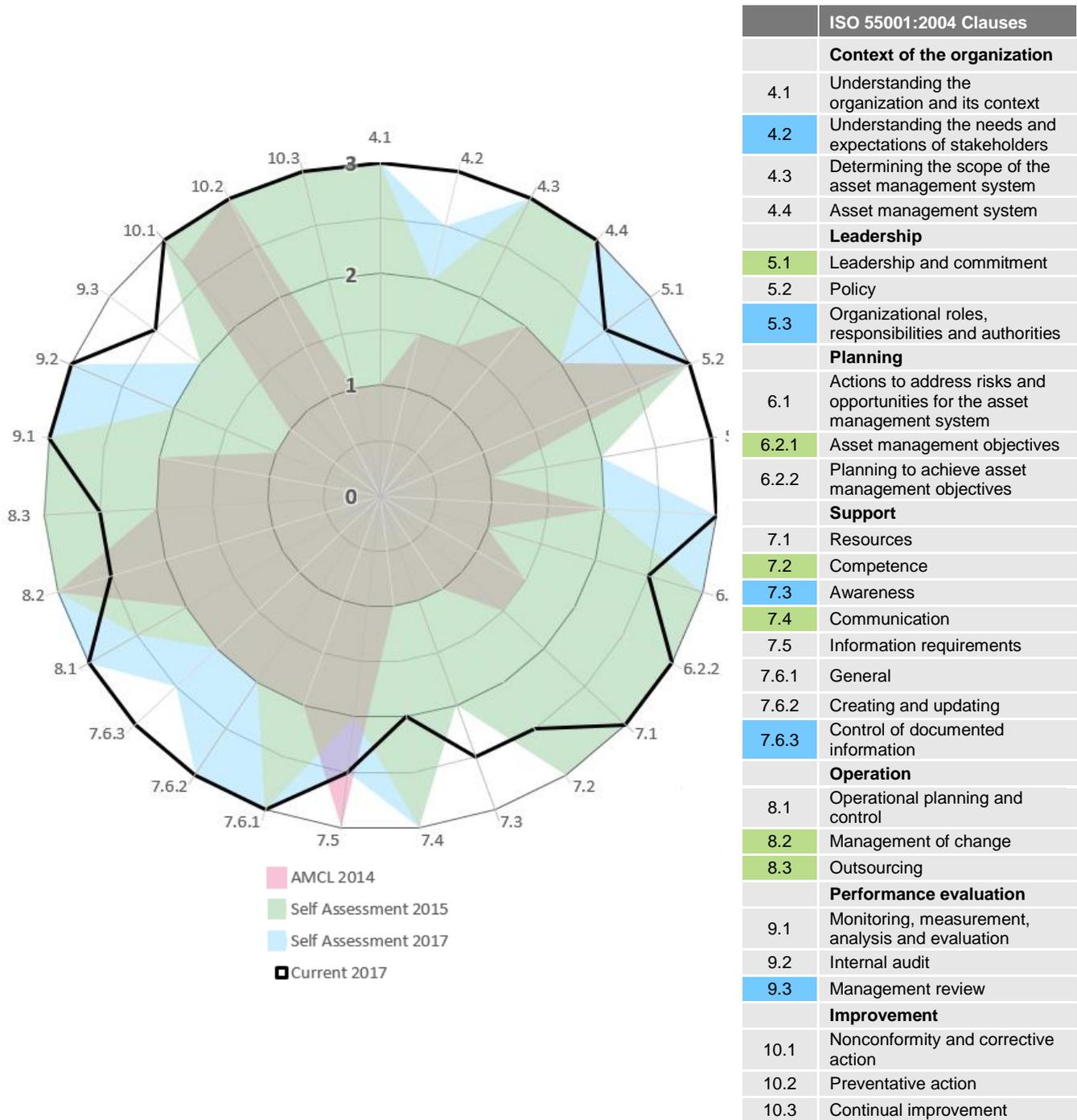


Figure 7 ISO 55001:2014 Performance comparison to previous assessments

4. Certification Advice

4.1 Preparation

For ActewAGL to take the next step to ISO 55001 certification, a certification company accredited by JAS-ANZ should be engaged.

There are currently **four** organisations in Australia accredited to provide certification, these are:

- SAI Global Certification Services Pty Ltd;
- Bureau Veritas Australia Pty. Ltd;
- Lloyd's Register Quality Assurance Ltd;
- And BSI Group (Australia and New Zealand) Pty Ltd.

During the certification process, the auditor may take this maturity assessment into consideration. However, they must make their own assessment through independent onsite investigation work, collection of the required documentary evidence, and staff interviews.

Internal staff and document owners must be given **one month's notice** to ensure all documentation is up to date and auditable. It is important to ensure that:

- All Asset Specific Plans are recently reviewed, up to date and complete, containing objectives linked to stakeholder requirements, decision making criteria, methods and processes;
- Internal and external stakeholders are clearly identified, linked to their requirements and issues
- All process documentation is up to date
- All linking required by the ISO 55001 clauses between documents, such as policy, strategy, objectives, processes and plans are traceable **internally** and **between the AMS and corporate documents**.
- Evidence of outcomes is available.

4.2 Business Benefits

The benefits of certification to the ISO 55001 standard include:

- **Improved reputation**
There are currently few organisations in Australia certified to ISO 55001. Certification would place ActewAGL very high as an example of best practice in Australia.
- **Defined strategic alignment between corporate and asset management objectives**
This ensures that stakeholders needs are met through the organisations AM activities; it gives confidence to the public and to regulators that ActewAGL manages these critical assets efficiently and effectively.
- **Clearly defined criteria for performance**
Robust and visible information requirements for asset management ensures continuous improvement through the feedback of condition information back into the system; quality is not lost through gaps between processes. The process allows for identification of areas for improvement.

- **Increased network reliability and improved business resiliency**
A high functioning asset management system that has passed audit level scrutiny will be less susceptible to failures and adverse impacts at weak-points in its business architecture.
- **Reduced failure rates, reduction of risk-related costs**
A certified AMS will have its weaknesses identified and risks mitigated, so the probability of a uncontrolled risk impacting the triple bottom line is greatly reduced.
- **Improved control and visibility of asset management and operational activities**
ISO 55001 certification is an assurance that an organisation has robust processes, and those processes are followed.
- **Cross-Functional alignment for the organisation**
The asset management system and ISO 55001 can be used as a framework to align the organisation to, and to drive change. The standard spans multiple business functions, and can serve as a focal point and a common unifying goal.
- **Future proofing and improved focus on continual improvement,**
The continuous improvement capabilities embedded in ISO 55001 will ensure that the business has the visibility, capability and control to more directly satisfy increasing customer expectations.
- **Investment in staff and job satisfaction**
ISO 55001 certification for the organisation would be a significant advantage for all staff who are part of the asset management system; participating in ActewAGL's achievement of this milestone would add a significant weight to an employee's career highlights.

A case study showing quantified benefits from ISO 55001 implementation and certification is available here:

- Sodexo / The Woodhouse Partnership

4.3 Estimated Certification Costs

The JAS-ANZ AMS scheme includes a guide and tabulated duration range for duration and complexity of the audit process, which is dependent on the number and complexity of assets managed by the organisation.

For ActewAGL's portfolio of assets, a review would include all 33 asset classes with ASPs in effect, and a review of other AMS and organisational documentation.

Assuming a *high complexity* audit for a mature organisation, across 33 Asset Specific Plans, each being considered a critical asset, JAS-ANZ guidelines indicate the duration would be approximately **8 days**. For a suitably qualified assessor working independently this is estimated to be **approximately \$15,000-\$20,000**.

Note that this figure is a guideline estimate only. The cost of the audit process will vary by provider, and can only be determined as part of the application process. ActewAGL must initiate this with a certification organisation directly. We recommend that all four certification organisations be approached, to ensure the availability of an assessor who is most qualified to review asset management for an electricity distribution network.

Certification lasts 3 years, and requires a renewal audit after this period. The certificate itself will list the compliant asset categories specifically.

5. Continuous Improvement

5.1 Advanced Asset Management

ActewAGL Distribution score very highly as a mature Asset Management business, and are compliant when scored against the ISO 55001 clauses. As much as possible, this assessment has included the gathering of relevant documentation to support the scores. While self-assessment yields high level understanding of how the business is operating, it is important to ensure that this assessment stands up independently in an audit situation.

There are areas where efforts are documented but not necessarily executed or sufficiently measurable. Additionally, some documentation is not up to date and does not represent the advances the business has made.

The risk of non-compliance should be mitigated through internal review and rationalisation of improvement initiatives, based on the Improvement Plan.

To consistently achieve scores that demonstrate that an element is fully integrated into the business; visibility of current operations is required as a baseline to measure outcomes, and create meaningful feedback into the update of strategy and plans. The improvement plan below focuses on achieving this.

5.2 Improvement Plan

The improvement plan aims to raise the awareness where AAD have gaps or misalignments in the execution or communication within the asset management framework. Over the past four years annual maturity assessments have been completed to check if the asset management progress has been keeping pace with the original AM software implementation program.

Table 3 on the following pages lists the previous improvement plan actions against each AM.

Table 3 Improvement Plan

Category and Element		Notes	Improvements (coloured text in parenthesis indicates 'refer also')	Tasks	
Setting Direction	110	AM Policy	The AM policy is well integrated with corporate policy, well documented and available for download. The policy is regularly reviewed, but it is unclear if the policy outcomes are reviewed.	Reinstatement of the Asset Management Committee would provide a means to drive policy outcomes and ensure they are met by the business. (610)	I
	120	AM Strategy	The business has a well-defined and thorough strategy within a detailed framework. This is understood explicitly at management levels, and staff at all levels have some understanding of the strategy.	Promotion of the AM strategy and framework within the business so that it is explicitly understood at all levels. (610)	I
	130	Demand Analysis	ActewAGL have a high degree of external consumer stakeholder engagement.	The only area for improvement here is around evaluation of the impacts of internal factors on delivery of AM objectives. Documentation of internal stakeholder requirements is required to measure these effectively.	I
	140	Setting AM Objectives	AM objectives are set for priority asset classes and have a systematic basis as they are generated by the asset planning system.	Presentation of AM objectives in a structured way within the documentation to improve communication and measurement. Increased promotion of objectives throughout organisation would improve awareness. Better communication between Asset Managers and Works Delivery would allow for objectives to be taken more fully into consideration in delivery.	I
Programming	210	Accounting & Costing	Accounting is well controlled, however it lacks the capability (i.e. existing reports or dashboards) to determine asset specific costs. The financial register costs assets using industry standards for asset classes. Costs are tracked to the work order / project-task level, which is linked to assets in the Works Management System (Cityworks). The missing link between Oracle and Cityworks for completed cost data makes reporting difficult; it is not part of BAU process. Historic cost data is not consistently tracked, and calculations for effective and residual lives of specific assets cannot be calculated.	Asset costing methodology can be improved by including procedure and technology for determining the cost of specific assets. Historic cost data cannot be tracked effectively until actual costs are integrated between systems, linking work tasks and costs e.g. through the "Actual Costs Integration" project which is currently on hold. (920)	II,III,IV
	220	Strategic Planning	Asset strategy is well planned and is highly consultative. Triple bottom line (social, economic and environmental) impacts are not specifically accounted for in the asset accounting procedure. This is considered through prioritisation in the budgeting process and external stakeholder management. However, it is not clear how the established budget process links directly to these in terms of metrics. Asset Managers would like to be able to calculate the value of a lost load if works don't go ahead. Currently this is manually performed as part of the risk assessment.	Improved business intelligence capabilities would allow the alignment of AM goals with specific internally published metrics. Effort in this area to formalise and automate the asset costing methodology would allow more accurate financial calculations to be made as part of cost benefit analysis in the budgeting process. (920) The Asset Accounting policy and procedure documentation should be reviewed and updated. <i>Additional note: the latest version of RIVA DS/PowerPlan includes advanced capital planning features; which enable "drag and drop" options analysis. The strategic planning process would benefit greatly from an upgrade of the software, once data capabilities are improved.</i>	I,II,IV
	230	Capital Expenditure Evaluation	Capital Expenditure Evaluation is performed on a project basis, there is not necessarily a policy that applies top-down. Due to the nature of regulatory funding, evaluation is often a function of getting the best value from the capped funding available.	Improving data quality and warehousing capabilities would improve the quality of Capex evaluation. This would open up capabilities for forecasting maintenance and operational costs for all asset classes and improve accuracy of evaluations. (920)	I,IV
Preparation	310	Maintenance Decision Making	Key performance is measured and matched to criticality and lifecycle status driving maintenance in a systematic way. Continuous improvement is evident; e.g. the 'George the Transformer' project for advanced analytics on power transformers.	Implementation of a Business Intelligence platform and data warehousing of enterprise data for access by analytical functions in RIVA DS (920). This would allow the organisation to perform more detailed analytics on maintenance that can be expanded across all asset classes. Completing task integration out of RIVA DS should be included (910). Providing good data as an input is critical for outputting good decisions.	III, IV

Category and Element		Notes	Improvements (coloured text in parenthesis indicates 'refer also')	Tasks
320	AM Plans	Plans are generated from data extracted from the asset planning system (RIVA). These go through a number of iterations between strategy and planning before they are able to be implemented.	<p>More detail is required in the Asset Specific Plans in order for them to be translated into planned works. ISO 55001 compliance requires the plans to include methods and criteria for decision making and prioritisation</p> <p>All improvement tasks would contribute to improving the AM Plans, notably providing more data for the objectives and decisions.</p>	I,II,III,IV
	Implementation of AM Plans	Program of Work Reporting effectively measures tasks and how the business is performing to the AM Plans. AAD generates a lot of data, including condition assessments, work cost data to feedback from maintenance activities. However, this data is not standardised between systems or in a format that can be processed consistently or automatically. The existing process is working well for task and financial metrics	<p>A key activity before business intelligence can be established is the alignment of tasks between Asset Planning System and Works Management System. This is achieved through a standardised AM activities that integrate with the business and systems beyond the planning. (910)</p> <p>Planning roles and leads are well defined. The delivery of the plans and actions need to be delegated in the ASPs.</p>	II,III
Implementation	410 Operations	AAD excels in its day to day operations. Procedures and work method statements are managed well and have dedicated resources and ownership. Business Continuity Plans are in place and regularly tested.		
	420 Creation & Acquisition	Project Management processes are currently under review. Unit Assemblies are standardised, but continuous improvement of these are limited. Works Delivery employees do not trust content of UAs and do not have an accessible process for providing feedback.	<p>Create a process for feedback and improvement of standardised assemblies, so that field crews gain a sense of ownership and responsibility for their accuracy.</p> <p>Improve visibility of standards by automatically linking appropriate procedure and design documentation to standard work tasks or assemblies.(810)</p>	III
	430 Maintenance	Maintenance tasks are planned and initiated effectively, although there are some manual processes.	<p>Internal standardisation of asset lifecycle tasks and creation of unit assemblies for maintenance tasks will remove the current manual processing and improve scheduling capabilities. A specific area with significant manual processing here is substation maintenance.</p> <p>ISO 55001 requirements here are focused on resource planning inclusive of equipment. Improvement of the management of plant; in the same way labour resources are managed, would improve compliance.</p>	II
	440 Work & Resource Management	This is well managed and automated. Skills matching capabilities are built into the system. Tasks have unit assemblies. Workers are allocated skills in the HR system and Works Management system. Workers can be allocated to work orders based on their availability and capability. Gaps exist around work prioritisation (priority is not recorded in the systems). Resource planning is performed using a planning tool (a complex excel sheet) that is constantly improved.	A business intelligence solution would provide a platform for long term resource planning; by unifying strategic activities with medium and short term resources. (920)	IV
	450 Rationalisation & Disposal	Disposals are not tracked effectively in systems, the process relies on the movement of the physical assets themselves after removal.	Inclusion of the end of the asset lifecycle in the standardisation activities (330) would improve visibility and opportunities for better rationalisation.	II

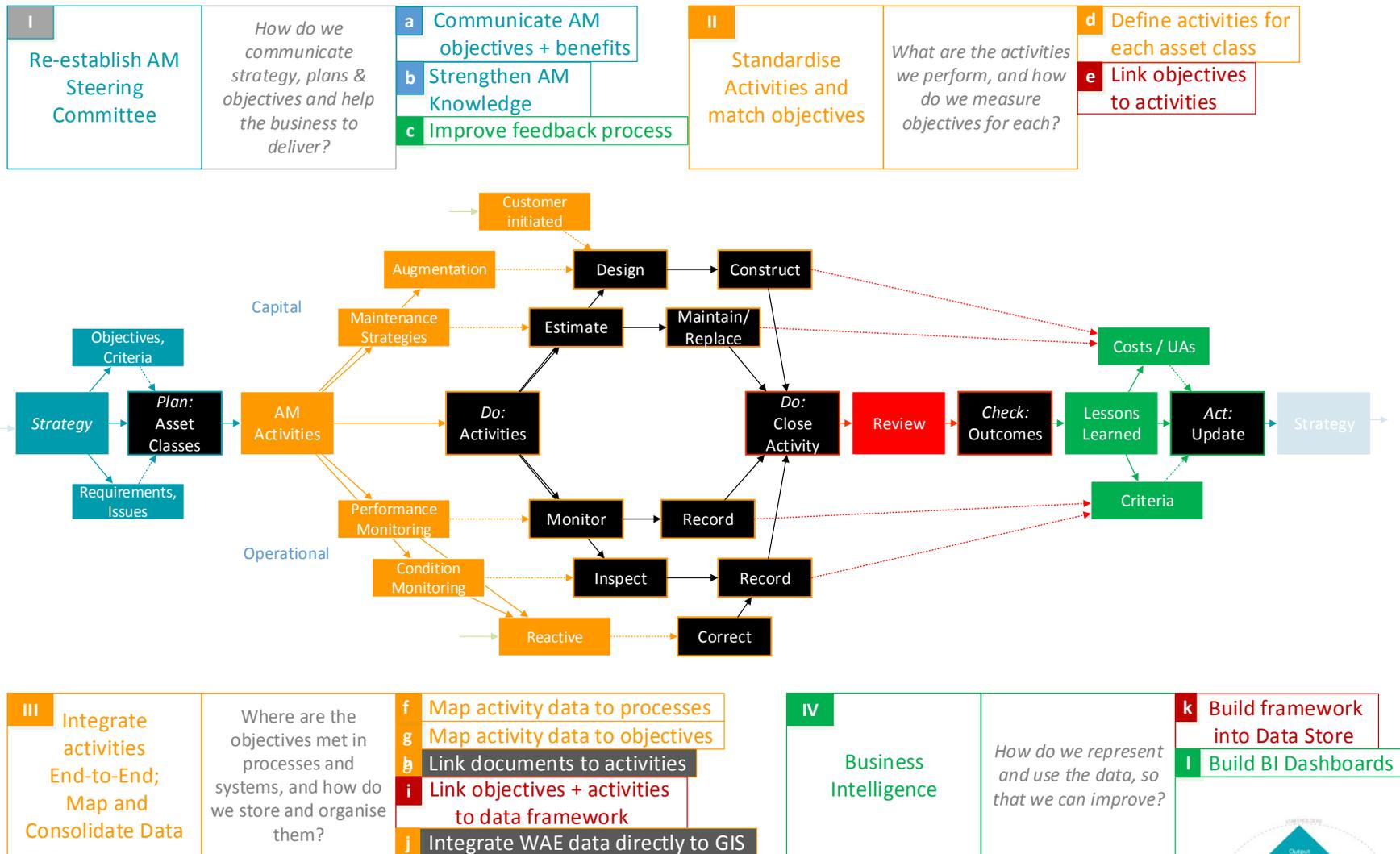
Category and Element		Notes	Improvements (coloured text in parenthesis indicates 'refer also')	Tasks
Asset Monitoring	510	Asset Condition Monitoring Condition monitoring is embedded in the strategy, and metrics for asset classes are included within the plans. Control is exercised by the Asset Managers by setting up the strategies and determining the PoW. E.g. frequency of inspections.	Expansion of condition monitoring strategies can be considered once ASPs and the technology platform are improved. (820)	
	520	Asset Performance Monitoring The monitoring strategy is outlined in the SAMP and objectives and detailed in the asset specific plan. Design of the monitoring is done by individual asset managers (AMs). AMs control monitoring through the ASP, including determining POF, COF. AMs write the procedure determining the frequency and circumstances of monitoring. Reports are compiled by asset managers. UAs are updated when materials or standards change. The ADMS records some asset failures, however the information is not easily accessible.	Projects are currently being initiated to improve and increase performance monitoring, e.g. through measuring performance including under fault conditions for Power Transformers; the 'George the Transformer' project... A data store or data warehouse solution is required to capture and consolidate this data, enabling analysis of performance. A baseline platform is required here that can be shared with other systems (not just asset related), to prevent limitations of a bespoke or point-to-point solution per asset type. (920)	IV
	530	Incident Investigation Safety Alerts are sent out to the company based on internal incidents and those in other companies. Reactive and emergency response procedures are in place and procedures are linked to incident investigation work orders by default. Processes are reviewed and used regularly. Issues with the process are high visibility. Guardian incidents are investigated and audited. Reports are produced regularly including for regulator.	A current known issue with duplication of incident requests should be rectified to ensure that the ISO 55001 requirement of unambiguous responsibility for investigation is fully covered.	III

Category and Element		Notes	Improvements (coloured text in parenthesis indicates 'refer also')	Tasks
Management Systems	610 Management System	<p>The management system is thorough and well documented. However the metrics around delivery are not detailed and do not directly link to objectives.</p> <p>Management must be able to consider the adverse impacts of the AMS on stakeholders and other parts of the organisation, for example the impact of outages for maintenance on customers.</p>	<p>Reinstatement of the AM Committee would provide a baseline to ensure AM relevant actions are executed within the business, and that they are not detrimentally affecting stakeholders and other areas of the business. (710)</p> <p>ISO 55001 certification requires assurance on the management and planning processes in the form of KPIs and KRIs. Implementation of quantitative metrics into the framework and linking objectives to Key Results Indicators (KRIs) will allow the business to readily view how the asset management system is operating, whether objectives are being met, and provide assurance to the planning process. These should be formalised as part of a data warehouse implementation. This will allow AAD to centralise data for reporting, more readily measure progress, and efficiently generate reports through a standardised platform. (330) (920)</p> <p>The AM Framework document should be finalised and approved from its current draft version.</p> <p>The Management Operating System (MOS Manual) shows commitment to execution of AM Strategy and ISO 55001. We recommend this be reviewed and updated to reflect ISO certification plans (removing references to PAS55 certification) and integrate further with the current AM Strategy and Framework documentation.</p>	I, II
	620 Business Risk Management	<p>The business handles operational and strategic risk very well. Historically there has been a gap around internal risk management, specifically with reference to change, however the Business Transformation team are dedicated to this and continuously improving.</p> <p>Climate Change risks are managed at a strategic level.</p>	<p>Change management is a key element of ISO 55001, it should be given due consideration for all business initiatives and projects.</p> <p>Making change management resources available internally for projects would mitigate some of the internal risks generated by change. AM critical implementations that do not yield the benefits required can be improved through imbedding staff in the projects for ongoing initiatives in order to communicate benefits and ensure staff are engage.</p>	I
	630 Asset Risk Management	<p>This is managed very well.</p>	<p>A clearer link between the outputs of risk analysis and the “process to update processes” is required. The Risk Management Policy could articulate and reference asset related risks more directly.</p>	I
	640 Continuous Improvement	<p>ActewAGL have dedicated resources for improvement (business transformation team). Asset & Network Performance Branch have dedicated asset managers responsible for driving this from an AM perspective.</p>	<p>Improvement of reporting capabilities would assist in measuring improvement and providing assurance. (920)</p>	IV
	650 Legal, Regulatory & Other Req'ts	<p>The business excels in this regard through the skills of dedicated resources.</p>	-	

Category and Element		Notes	Improvements (coloured text in parenthesis indicates 'refer also')	Tasks	
People and Organisation	710	Organisational Issues	The business has clearly defined and dedicated roles and responsibilities. Strategic goals are achieved and the organisation is continuously improving.	Re-establishment of the AM Steering Committee would ensure that asset management objectives can be more effectively implemented. (610)	I
	720	People Issues	Asset management skills are not specifically tracked. An e-learning initiative is in discussion.	Development of an AM skills matrix within the Asset Strategy and Asset & Network Performance branches will provide tracking and metrics for improving overall delivery of asset management plans. Internal development of AM skills would also reduce dependency on external resources. Asset Managers would benefit from specific Asset Management Fundamentals training. This could be achieved through entry to the learning path for the AMBOK (Asset Management Body Of Knowledge) and engagement with the Asset Management Council through Associate membership.	I
	730	Commercial	Procurement processes are well managed and controlled. Works contracts and quality are well managed. However, more could be done to automate contract management activities and contractor feedback. ISO criteria for contractor access to Information, information feedback, supervision and performance monitoring are met but not fully integrated.	Providing a more integrated framework for contractor feedback and data collection, through digital access to job information. Portals or apps would reduce manual management and improve data quality. This may become more imperative for operational flexibility if specific work types need to be outsourced. Automation of contractor payment workflow would also reduce internal workload and provide a better experience for contractors.	III
	740	Communication	Communication is well managed externally. Internally individual sections do not have a complete understanding of the importance of certain Asset Management activities and standardisation. Organisational documentation management has good infrastructure in place, but documents do not appear to be proactively managed. Drawing management (construction, standardised drawings) and CEO consultation and communication are exemplary.	The organisation will benefit from a program to improve the communication of the AM policy and system. This will improve general understanding of how AM drives what the business does, what its impacts are, and promote common terminology and ideas. Fixed communications like posters provide persistent reinforcement of such subject matter, if constructed effectively.	I

Category and Element		Notes	Improvements (coloured text in parenthesis indicates 'refer also')	Tasks
Data and Information	810	Process to Manage Asset Knowledge Asset management is understood generally with the Asset Strategy and Asset & Network Performance branches. There are improvements included within the AM framework.	<p>While there are processes in place, the errors and risks generated by manual processing can be reduced by further integration and automation. Existing systems could be better integrated to publish general condition information (820) and asset-specific detailed data to the GIS, e.g. connecting Asset Data capture forms in Cityworks 2015 to GIS fields. This would actively ensure quality of data. Systems and organisational understanding of the data would benefit the use of simplified condition information.</p> <p>Tangible benefits can be realised by integrating documentation into systems. For example, packaging procedures, drawings, risk and safety information into (e.g. work order) templates and/or unit assemblies, making them readily available to staff performing these activities.</p>	III
	820	Asset Data & Knowledge The GIS as a central data repository provides ready access to asset data. The management of this information is consistent and updated regularly. ActewAGL have had a number of projects to migrate data from previous systems, but some of the data is 'mothballed' in legacy systems (e.g. WASP). There is no data governance in place to ensure data quality is managed. There are gaps in existing data, but this is a function of the complexity of the electricity network.	<p>Data quality and coverage would be improved by simplified and standardised asset condition information and scoring for all asset classes, recorded in the GIS, specifically:</p> <ul style="list-style-type: none"> - Unified AM standardised condition score (1-5 scale, where 1 is as-new) - Installation Date - Last Maintained Date - Last Inspected Date <p>Once this is established and pushed to a data store (920), the technology becomes more useful for visibility of what the business is doing.</p> <p>Leveraging the organisations commitment to document management (through "Project 201"), and linking the available documentation to system data would provide a means to ensure asset knowledge is shared.</p>	II,III,IV
	830	Activity Data & Knowledge ISO 55001 data in this area focuses on risk; the business has started to collect field risk assessments digitally. Asset Specific Plans contain risk assessments, but this is not necessarily integrated into systems for measurability.	<p>Inclusion of processes for training opportunities from these would improve usefulness of risk information collected. Creation of standard risk codes.</p>	III

Category and Element		Notes	Improvements (coloured text in parenthesis indicates 'refer also')	Tasks	
Technology	910	Information System Issues	ActewAGL are ahead of the rest of Australia in terms of integrated operational systems; and is continually improving.	<p>The next step is to extend on AAD's lead is to close the data lifecycle loop between operational and planning systems.</p> <p>A software level integration between the Asset Planning (RIVA) and works management (Cityworks) systems would ensure that all aspects of the asset lifecycle are recorded. This is in the strategic plan, but the project has not started.</p> <p>The business understands the need for quality data as it is critical to operations, though data quality management is performed reactively. A review of the systems for alignment with ISO8000 would highlight areas where processes could be established and data quality improved proactively.</p>	III
	920	Financial & HR Information Systems	Financial, billing and customer information, HR systems are integration. The lack of a data store reduces reporting capabilities.	<p>Advanced Asset Management relies on a consolidated view of current and historical data. This includes a full view of resources in the business, how they are utilised, how they are achieving objectives, and the financial impacts on the business of its operations.</p> <p>Implementation of a Business Intelligence project. ActewAGL does not have a data warehouse/historian/time-series system in place that can be readily utilised for reporting, analysis and modelling. Prerequisite to undertaking this would be to standardise condition scoring across all asset classes (810,820), and standardise asset activities, aligning these to the AM objectives.</p>	IV
	930	Asset & Work Management Information Systems	AAD are significantly ahead in this area, although the criteria in this scoring section does not directly relate to ISO 55001.	<p>The only areas for improvement in this respect are in</p> <ul style="list-style-type: none"> - Integration of Emergency Response Plans into the works management systems - Broadening scope - Standardised data capture for asset condition information (920) 	III
	940	Supply & Logistic Management Information Systems	ActewAGL have an advanced integrated purchasing system that translates standardised asset assemblies directly into requisitions.	<p>Improvements in this area could include</p> <ul style="list-style-type: none"> - Tracking of rotatable assets through barcoding or another smart tracking method, enabling a more integrated tracking of assets through their lifecycles. - Mobile/digital requisitions and approvals for reactive works. 	III
	950	Advanced Information Systems	ActewAGL excels in its real-time and operational capabilities. The advanced areas in this section are not essential for ISO 55001 compliance. However, they are the next step to ensure compliance is easily achieved and maintained, as they enable asset life cycle cost modelling, and improve business efficiency overall.	<p>Areas for improvement include</p> <ul style="list-style-type: none"> - Linking knowledge management and Quality Assurance to other systems; e.g. procedures link to Work Order templates (810,820) - Predicting asset performance, capacity, utilisation, failure and costing through scenario planning and options modelling. These are reliant on a platform to collect historical data which can be used to predict future data. (920) This capability would also allow for sharing of asset data with other utilities who operate the same asset classes. 	III, IV



This diagram maps the asset lifecycle functions performed by ActewAGL against the 'Plan Do Check Act' cycle as presented in the Asset Management Concept Model. The Improvement Plan is aligned to this through colour coding.

The Asset Management Concept Model (right) is used with permission of the Asset Management Council.

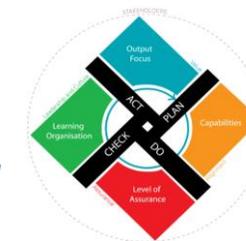


Figure 8 - Improvement tasks infographic

Appendices

Appendix A – Workshop Attendees

Workshop Attendees

Name	Title
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

Interviews

Name	Title
[REDACTED]	[REDACTED]

Ad-hoc clarifications

Name	Title
[REDACTED]	[REDACTED]

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<https://projects.ghd.com/oc/Advisory/actewaglmaturityasse/Delivery/Documents/ActewAGL - AM Maturity Assessment report.docx>

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Rev No.	Author	Reviewer		Approved for Issue		
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