ATCO Gas Australia Pty Ltd

LogiCamms Project Number: 71-60660.00

Asset Management Systems Review

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Prepared By:	Shane Becker	**Signature:**	[redacted]
Reviewed By:	Wal Terlecki	**Signature:**	[redacted]
Approved By:	Mitch Price	**Signature:**	[redacted]

Revision History

Revision	Rev. Date	Reason for Revision	Prepared By	Reviewed By	Approved By
A	17/04/2020	Draft for review	Shane Becker	Wal Terlecki	Mitch Price
B	07/05/2020	Revised draft following ERA feedback	Shane Becker	Wal Terlecki	Mitch Price
0	15/05/2020	Issued for use	Shane Becker	Wal Terlecki	Mitch Price

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1 Executive Summary

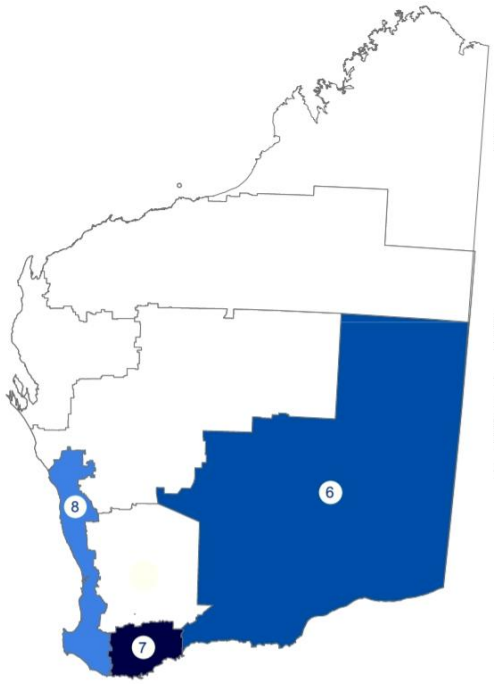
The following Executive Summary is written in conformance with the 2019 Audit and Review Guidelines (Electricity and Gas Licenses), Clause 5.1.1.2 for Reviews.

1.1 Review Purpose

This review has been conducted to assess the effectiveness of the licensee's asset management system in accordance with the review requirements set out in the Guidelines.

1.2 Licensee Assets Reviewed

The Review scope includes the assets operated under ATCO Gas Australia Pty Ltd's Western Australian gas distribution license GDL 8. The License area includes Coastal, Great Southern and Goldfields-Esperance gas supply areas as shown in plan ERA-GAS-006(C), in accordance with ERA Licence GDA 8, Schedule 1, Section 2.1.



6 – Goldfields-Esperance Supply Area
7 – Great Southern Supply Area
8 – Coastal Supply Area

Figure 1 - Extract from Coastal, Great Southern & Goldfields Esperance licence area (distribution) plan ERA-GAS-006(C).

1.3 Licensee business description

ATCO Gas Australia Pty Ltd (AGA) is the business that holds the assets under the scope of this review. ATCO Gas Australia Pty Ltd is part of the ATCO Group, which is a diversified, Canadian-based, international group of companies.

ATCO Gas Australia owns and operates the gas distribution network in Western Australia, delivering gas to approximately 760,000 end users in 18 communities, including metropolitan Perth and surrounding regions of Geraldton, Bunbury, Busselton, Kalgoorlie, Albany, Harvey, Pinjarra, Brunswick Junction and Capel. The ATCO Gas Australia gas distribution network consists of approximately 14,000 km of natural gas pipelines.

There have been no substantial changes to these assets since the end of the previous review period, 31 January 2017.

1.4 Summary of licensee actions since the previous report

The previous review found the control environment operated by the licensee was performing effectively. The overall assessment determined the asset management systems are effective for the assets under management. There were no deficiencies identified requiring action as an outcome of the previous review (i.e. deficiencies rated C, D, 3 or 4). Considerations for improvements arising from the previous review are therefore discretionary.

AGA confirmed that since there were no actions requiring a post-review implementation plan, no plan was generated.

1.5 Summary of review findings and recommendations

The review found the asset management system is effective with controls in place to maintain system effectiveness, although some deficiencies do require addressing.

The review found the following asset management process elements to be operating effectively with no deficiencies discovered: Element 3 – Asset disposal, Element 5 – Asset Operations, Element 10 – Financial Planning, Element 11 – Capital Expenditure Planning, and Element 12 – Review of AMS.

The review found the following elements to be operating effectively with minor deficiencies not requiring corrective action (i.e. elements with deficiencies rated B or 2): Element 1 - Asset Planning; Element 2 – Asset creation and acquisition, Element 4 – Environmental Performance, Element 6 – Asset Maintenance, Element 7 - Asset management information system, and Element 9 – Contingency Planning.

The review found Element 8 (Risk Management) to be operating with some sub-element deficiencies requiring corrective actions (i.e. deficiencies rated C, D, 3 or 4). Recommendations included:

- Ensuring the overdue actions in the Technical Compliance Register (TCO R0003) are resolved or re-assessed with revised dates assigned.
- Ensure sign-off of all risk related assessments. The examples cited were works permits not signed-off at completion, including a major works permit.

The review found significant investment has been made into improvement of asset management over the reporting period, including:

- Improvements in demand management following implementation of learnings
- Improvement in customer connection timeframes though adjustments in incentive KPIs and tracking
- In-line inspection capability upgrades
- Upgrading multiple information management system platforms
- Implementation of investigation recommendation outcomes such as the reducing potential single-point system failure locations through the network by increasing network redundancy.
- Improvements in leak detection equipment and methods.

Updating the asset management system to align with the ISO 55000 suite of standards.

Table 1 shows the ratings for each asset management area from the 2020 review giving an overall assessment of the effectiveness of the licensee's asset management system.

Table 1 – 2020 Review Ratings

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
1. Asset planning	B	1
2. Asset creation and acquisition	B	2
3. Asset disposal	A	1
4. Environmental analysis	A	2
5. Asset operations	A	1
6. Asset maintenance	A	1
7. Asset management information system	A	2
8. Risk management	B	3
9. Contingency planning	A	2
10. Financial planning	A	1
11. Capital expenditure planning	A	1
12. Review of AMS	A	1

1.6 Asset management system effectiveness

It is the opinion of the reviewer that the asset management system is effective with controls in place, as well as ongoing investment into continuous improvement, to maintain system effectiveness.

2 Review Objectives

The following review objectives is written in conformance with the 2019 Audit and Review Guidelines (Electricity and Gas Licenses), Clause 5.1.2 for reviews.

2.1 Objectives and Purpose

The purpose of this review is to assess the licensee's asset management system, which includes the asset management plan, and the staff and Information Technology (IT) resources that support the plan.

In accordance with the Review Plan (7160660-PME-PLN-001), the objective of this review is to:

- Assess and document the effectiveness and implementation of business strategies and plans for proper operation, maintenance, construction, and alteration of the assets covered by GDL8.
- Provide an overall ranking of the effectiveness of the asset management system processes.
- Detail action items or recommendations for improvement of the asset management system.

2.2 Methodology

The review was conducted in accordance with the Economic Regulation Authority's 2019 Audit and Review Guidelines: Electricity and Gas Licenses, and in accordance with the Review Plan independently prepared by LogiCamms, based on the Guidelines, and approved by the ERA.

The Review process is comprised of the following aspects:

- Approval of Review Plan by AGA.
- Approval of Review Plan by ERA.
- The conducting of a reasonable assurance engagement including-
  - field review in Jandakot and a site visit in Bunbury
  - a review of documentation and systems,
  - a review of the actions taken in response to the recommendations from the previous review,
  - a review of legislative documentation and interviews with relevant personnel from the AGA business
- Preparation of the Review Report, incorporating an agreed post-review implementation plan to address any recommendations, in the format specified by Section 5 of the Audit Guidelines.
- Approval of the Review Report and post-review implementation plan by ERA
- Implementation or actioning of Review Report action items by AGA.

3 Scope of Work

The following Scope of Work is written in conformance with the Economic Regulation Authority (ERA) 2019 Audit and Review Guidelines (Electricity and Gas Licenses), Clause 5.1.3 for reviews.

This review has been undertaken in conformance the ERA Guidelines for reviews, and the approved Review Plan (7160660-PME-PLN-001).

The Guidelines provide the ERA's requirements for conducting performance audits (audits) and reviewing asset management systems (reviews). According to the Guideline, audits and reviews have a separate and distinct purpose and scope. A review is covered by the scope of this report; an audit is excluded from the scope of work.

This review assesses the licensee's asset management system, which includes the asset management plan, and the staff and IT resources that support the plan.

The review scope covers the Gas Distribution Network as per the license GDL8.

3.1 Review period

The review period covers 1 February 2017 to 31 January 2020 inclusive.

3.2 Type of assurance engagement

The review conducted was a reasonable assurance engagement in accordance with the requirement and definition provided in Section 1.6.2 of the 2019 Audit and Review Guidelines (Electricity and Gas).

3.3 Site Visits

During the review, the following sites were visited:

- Jandakot Office and Facility Depot
- Bunbury Facility Depot
- Field work and project review at Lot 54, Vittoria Rd, Glen Iris
- Residence at 4 Glenfield Drive, Australind, during removal of a retailer lock for a routine meter change-out.
- Pressure Reduction Station (PRS) 'PRS016' at Bunbury-Clifton Rd.

3.4 Personnel and Documentation

3.4.1 Licensee's representatives

Table 2 - Licensee's Representatives Interviewed

No.	Process Area	Interviewee/s
1	Asset Planning	Kelvin Grace, Manager Asset Services Sin Wei Lim, Manager Asset Performance Tony Yiu, Senior Manager Risk & Compliance Amber Nutley, Senior Risk and Compliance Advisor

No.	Process Area	Interviewee/s
2	Asset creation and acquisition	Kelvin Grace, Manager Asset Services Jason Lilly, Senior Manager Construction Sin Wei Lim, Manager Asset Performance Sam Oler, Manager Engineering Services Amber Nutley, Senior Risk and Compliance Advisor Sandra Smith, Project Construction Coordinator Neil Jordan, Manager Capital Projects Tony Yiu, Senior Manager Risk & Compliance
3	Asset disposal	Kelvin Grace, Manager Asset Services Jason Lilly, Senior Manager Construction Sin Wei Lim, Manager Asset Performance Sam Oler, Manager Engineering Services Amber Nutley, Senior Risk and Compliance Advisor Sandra Smith, Project Construction Coordinator Neil Jordan, Manager Capital Projects Tony Yiu, Senior Manager Risk & Compliance
4	Environmental analysis	Tony Yiu, Senior Manager Risk & Compliance Stuart Jobling, Manager Technical Compliance
5	Asset operations	Kelvin Grace, Manager Asset Services Matthew Marshall, Senior Manager Operations Read Louw, Supervisor Control Room Shelene Richards, Manager Planning Mark Turner, Manager Network Control Amber Nutley, Senior Risk and Compliance Advisor
6	Asset maintenance	Kelvin Grace, Manager Asset Services Matthew Marshall, Senior Manager Operations Read Louw, Supervisor Control Room Shelene Richards, Manager Planning Mark Turner, Manager Network Control Amber Nutley, Senior Risk and Compliance Advisor
7	Asset management information systems	Kelvin Grace, Manager Asset Services Tony Yiu, Senior Manager Risk & Compliance Chris Marshall, General Manager IT Christine Diprose, Manager Risk and Compliance
8	Risk management	Stuart Jobling, Manager Technical Compliance Christine Diprose, Manager Risk and Compliance Edward Ee, Senior Engineer Technical Services Tony Yiu, Senior Manager Risk & Compliance
9	Contingency planning	Stuart Jobling, Manager Technical Compliance Matthew Marshall, Senior Manager Operations Tony Yiu, Senior Manager Risk & Compliance
10	Financial planning	Sin Wei Lim, Manager Asset Performance Tom Sims, Senior Corporate Accountant
11	CAPEX planning	Sin Wei Lim, Manager Asset Performance Tom Sims, Senior Corporate Accountant

No.	Process Area	Interviewee/s
12	Review of the AMS	Kelvin Grace, Manager Asset Services
-	Site Visits	Jandakot: - Kelvin Grace, Manager Asset Services - Matthew Marshall, Senior Manager Operations Bunbury and surrounding locations: - Matthew Marshall, Senior Manager Operations - Mick Sheaf, Supervisor Bunbury

3.4.2 Documents and sources of other information

The documents and sources of information include information, data and documents tabled during the interviews, and the documents provided to the reviewer, are listed in Appendix B – Table of Documents Reviewed.

3.5 Work Schedule

3.5.1 Activities performed during the review

Activities performed during the review include:

- Interviews of key personnel, the majority conducted at the Jandakot facility, with some at the Bunbury facility and surrounding regions, conducted over two weeks from 10th to 28th February 2020.
- Two facility visits, at Jandakot and Bunbury, including inspection and interviews. At each facility the review included site personnel interviews as well as inspections of storage areas, notice boards, forms, training facilities, systems, supporting software, offices, equipment testing and calibration facilities, and vehicles.
- Document reviews and report writing conducted throughout March 2020.

3.5.2 Details of review team members and hours utilised

Shane Becker – Lead Reviewer

- Senior engineer with over 20 years of experience in asset management, technical compliance, and pipeline engineering
- Chartered Professional Engineer (CPEng)
- Certified Practitioner in Asset Management (CPAM)
- Certified Asset Management Assessor (CAMA)

Christian Canizales Torres – Reviewer's Assistant

- Engineering professional with over 2 years of experience in Asset Management and Auditing within Mining, and Oil and Gas industries.
- Masters of Subsea Engineering - Curtin University
- Petroleum Engineering – Industrial, University of Santander

Eric Wong – Support Team

- Eric is the Engineering Manager Pipelines for OSD Pipelines, a division of LogiCamms, with over 10 years engineering experience in plant design, gas and petroleum pipelines, and slurry and water pipelines, pipeline operations and audits.
- Bachelor of Engineering (Chemical), Curtin University with Honours

Alastair Krebs – Support Team

- Senior auditor with 35 years' experience in Asset Management, Maintenance, Integrity, Risk and Reliability Management, gained within Offshore & Onshore hydrocarbon exploration, supply and processing industries, Electrical Power Generation, Mining resources, Public utilities & infrastructure.
- Bachelor's Degree (Computing and Electronics)
- Certificate IV in Frontline Management, Leadership Management Australia.
- Higher National Certificate in Electrical and Electronic Engineering, Falkirk College of Technology.
- Certificate in Industrial Measurement and Control, City & Guilds of London Institute.
- ISO 9000 Lead Auditor Accreditation, SAI Global.

Wal Terlaecki – Support Team

- Project delivery professional in the delivery of green/brownfields (fixed and linear infrastructure projects) spanning R&D, defence and energy sectors in role of client, consultant or contractor. Wal has performed in senior roles for energy power projects including gas transmission and power generation projects.
- Bachelor of Engineering (Mechanical) (Honours), Curtin University of Technology, Western Australia

Mitchell Price – Review Plan Development and Support Team

- Maintenance and Asset Management Specialist with more than thirty years' experience within the Oil and Gas, Mining, Chemical and Utility industries, specialising in project engineering, maintenance and procurement roles.
- Graduate Certificate in Reliability Engineering
- Graduate Diploma in Maintenance Management
- Certificate of Trade Studies in Instrument Fitting
- Certificate of Technical Studies in Process Control Instrumentation
- Certificate II in Information Technology
- Certificate IV in Programming Technology

Table 3 - Hours Utilised

Resource	Hours Utilised
Shane Becker – Lead Reviewer	200 hours
Support Engineering Team Eric Wong - Engineering Manager Pipelines Alastair Krebs – Asset Management Auditor Wal Terlecki - Manager OSD Pipelines (West)	100 hours
Project Management Mitchell Price – Asset Performance Manager (WA)	30 hours
Reviewer's Assistant Christian Canizales Torres – Asset Performance Engineer	120 hours
Lincoln Coelho - Document control and administration	20 hours
Monica Mandona - Cost Control	10 hours

3.5.3 Period over which the review was performed

The review covered the period from 1st February 2017 to 31 January 2020.

The review timeframes are captured in Table 4.

Table 4 - Review timeframes

Activity	Timeframe
Planning	06th to 05th February 2020
Interviews and information collection	10th to 29th February 2020
Draft Report and data assimilation	2nd to 31st March 2020
Report Finalisation	1st to 30th April 2020

3.5.4 Deviations from the Review Plan

2019 Audit and Review Guidelines (Electricity and Gas Licenses), Clause 5.1.4, requires a description of deviations from the review plan: - there were no deviations from the review plan.

4 Recommendations from the previous review

The 2019 Audit and Review Guidelines (Electricity and Gas Licenses), Clause 5.1.5, requires review of recommendation from the previous review.

As there were no deficiencies requiring correction (i.e. elements with deficiencies rated C, D, 3 or 4), no further requirements carry over from the previous report.

5 Asset Management System Performance

The following sub-sections detailing performance summaries, observations and recommendations are written in conformance with the 2019 Audit and Review Guidelines (Electricity and Gas Licenses), clauses 5.1.6.2, 5.1.7 and 5.1.8, for reviews.

The process and policy rating scale is based on Table 9 of the guideline; and the performance rating scale is based on Table 10 of the guideline. The asset management elements are based on Table 23 of the guideline.

5.1 Asset planning (Asset Management Element #1)

5.1.1 Licensee's Performance Summary

In accordance with Table 23 of the 2019 Audit and Review Guidelines (Electricity and Gas Licenses), the intended purpose and outcome of the asset planning element are:

- Purpose - "Asset planning strategies focuses on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price)."
- Outcome - "Asset planning is integrated into operational or business plans, providing a framework for existing and new assets to be effectively utilised and their service optimised."

The performance summary for asset planning is set out in Table 5.

Table 5 - Asset planning performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
1. Asset planning	**B**	**1**
1.1 Asset management plan covers the processes in this table	B	1
1.2 Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning	A	1
1.3 Service levels are defined in the asset management plan	A	1
1.4 Non-asset options (e.g. demand management) are considered	A	1
1.5 Lifecycle costs of owning and operating assets are assessed	A	1
1.6 Funding options are evaluated	A	1
1.7 Costs are justified and cost drivers identified	A	1
1.8 Likelihood and consequences of asset failure are predicted	A	1
1.9 Asset management plan is regularly reviewed and updated	B	2

5.1.2 Observations

General

AGA's business planning takes into consideration historical and forecast performance, the external environment, future demand, and corporate requirements and standards. Three key divisions within AGA delivering the business plan outcomes are Asset Services, Engineering Services and Operations (including Capital Infrastructure). Asset Services manage the existing gas network and the associated strategies. Engineering Services provide technical oversight and support. Operations are responsible for construction of capital infrastructure and provide audit and inspection services.

The AGA Strategic Asset Management Plan provides the link between business planning and asset management planning outlining organisation objectives and drivers, stakeholder interests, and regulatory requirements. The asset-specific asset management plans detail the related asset's performance measures, service level targets, and investments to align the objectives and performance criteria. Asset Lifecycle Strategies detail the associated asset management tactics employed for each asset class within the distribution network.

Element 1.1 A review of the Strategic Asset Management Plan (AGA-S&P-PL01), and the associated asset management plans (e.g. Coastal – AGA-S&P-PL02, Albany - AGA-S&P-PL03, and Kalgoorlie - AGA-S&P-PL04), indicate the required process elements of Table 23 of the Guideline are covered by the asset management system. Table 3 of the Strategic Asset Management Plan details the components of asset management covered; these elements can be matched to Table 23 except for Contingency

Planning, although evidence of contingency planning is able to be found throughout other elements of the system.

Element 1.2 Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning. They primarily capture Regulator requirements and customer needs. The Strategic Asset Management Plan captures the safety case requirements, customer interests and organisational drivers. The asset specific Asset Management Plans define the levels of service and the Asset Lifecycle Strategies further detail the tactics employed to achieve outcomes of the Strategic Asset Management Plan and the Asset Management Plan for each asset. Regulatory requirements are further captured and monitored through the Master Obligations Register. Customer feedback is captured and assessed through the Customer Benchmarking Annual Results which was provided to the review team. The report compares actual achievements against planned benchmark indicators.

The project documentation of the Como Reinforcement Project was reviewed and confirms stakeholder needs consideration in the project development and delivery.

Element 1.3 Service levels are defined in the asset management plan. The Strategic Asset Management Plan (AGA-S&P-PL01) describes the business operating context and service level requirements and considerations. The individual asset management plans detail pressure regulation ranges for the various sections of the respective networks; the Asset Management Plan – Coastal (AGA-S&P-PL02) was reviewed and confirms specified pressures for the Coastal gas supply areas defined in Gas Distribution Licence 8 (GDL8). The Asset Lifecycle Strategies provide key performance indicators, quantified services levels, for the supporting tactics required to achieve the outcomes detailed in the Asset Management Plan. The following Strategic Asset Lifecycle Strategies were reviewed and confirmed to have quantified service levels defined:

- Pressure Regulating Facilities Asset Lifecycle Strategy, AGA-S&P-ST09
- Supervisory Control and Data Acquisition Asset Lifecycle Strategy, AGA-S&P-ST10
- Pipelines Mains and Services, Asset Lifecycle Strategy, AGA-S&P-ST08
- Metering Facilities, Asset Lifecycle Strategy, AGA-S&P-ST07

Element 1.4 Non-asset options (e.g. demand management) are considered. The following was cited as evidence of consideration of ongoing demand management:

- Contingency planning documentation was reviewed to confirm readiness for unexpected demand changes.
- A case scenario was examined, regarding the worst-case winter of 2017, which served as an example of ongoing learning and continuous improvement in demand management.
- The Automated Data Acquisition was showcased confirming data collection and trending.
- The Synergi Annual network models were cited to confirm ongoing network modelling and forecasting.

Element 1.5 Lifecycle costs of owning and operating assets are assessed and updated into each of the area-specific asset management plans. The asset management plans for Coastal, Albany and Kalgoorlie were reviewed and each demonstrated detailed ten-year plans forecasting costs associated with each asset class such as pipelines, mains and services, regulating facilities, metering facilities, supervisory control and data acquisition, corrosion protection systems, fleet, property, plant and equipment and information technology.

Element 1.6 Funding options are evaluated. Asset Management Plans and their respective Asset Lifecycle Strategies were reviewed and included funding details and options. Funding details is further discussed in Section 5.2.

Element 1.7 Costs are justified, and cost drivers identified within the each of the asset management plans. Forecasts are based on a combination of historical expense and forecast estimates. Detailed

justification for expenditure elements were provided in the associated business cases cited. Asset Management Plans and example business cases were cited to confirm consistency.

Element 1.8 Likelihood and consequences of asset failure are predicted. The example of the Como Reinforcement project formal safety assessment was reviewed. Safety and Design Basis documents and HAZOP close out register was reviewed to confirm adequate assessment. During the presentation this was also demonstrated in the Project Design Report (PL106 inline inspection – Section 4.1 within the document).

Element 1.9 The Asset management plan is regularly reviewed and updated. The Asset Management Policy, Strategic Asset Management Plan and the four cited Asset Management Plans were all reviewed and updated within the reporting period. All these documents were updated early 2020 except for the Asset Management Policy which was updated early 2018. The previous AMS review also reported that AGA met the requirement for regular review and update of the asset management plan. Five of the secondary supporting documents cited or reviewed, which form elements of the asset management system, were noted to not have undergone revision for over five years. Refer to Appendix B - Table of Documents Reviewed, for details.

5.1.3 Process recommendations

The key recommendations are provided in Table 6.

Table 6 - Recommendations for asset planning

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
1	**Asset planning** Asset planning strategies focuses on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price)			B	1
1.1	Asset management plan covers the processes in this table	4	Observation: Element 9 of the Guidelines processes (Guideline, Table 23) is not covered in the Components of Asset Management of the Strategic Asset Management Plan (AGA-S&P-PL01, Table 3). AGA should add Contingency Planning to Table 3 of the Strategic Asset Management Plan (AGA-S&P-PL01).	B	1
1.2	Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning	4	Requirement fulfilled.	A	1
1.3	Service levels are defined in the asset management plan	4	Requirement fulfilled.	A	1
1.4	Non-asset options (e.g. demand management) are considered	4	Requirement fulfilled.	A	1
1.5	Lifecycle costs of owning and operating assets are assessed	4	Requirement fulfilled.	A	1
1.6	Funding options are evaluated	4	Requirement fulfilled.	A	1
1.7	Costs are justified and cost drivers identified	4	Requirement fulfilled.	A	1
1.8	Likelihood and consequences of asset failure are predicted	4	Requirement fulfilled.	A	1
1.9	Asset management plan is regularly reviewed and updated	4	Observation: Five supporting documents which form elements of the asset management system were noted to not have undergone revision for over five years. Refer to Appendix B – Table of Documents Reviewed, for details. AGA should ensure all documents are updated in accordance with latest standards, regulations and the AGA Document Control Procedure (AA-GRC-PR02).	B	2

5.2 Asset creation and acquisition (Asset Management Element #2)

5.2.1 Licensee's Performance Summary

The intended purpose and outcome of the asset creation and acquisition element are:

- Purpose - "Asset creation/acquisition is the provision or improvement of assets."
- Outcome - "The asset acquisition framework is economic, efficient and cost-effective; it reduces demand for new assets, lowers service costs and improves service delivery."

The performance summary for asset creation and acquisition is set out in Table 7.

Table 7 - Asset creation and acquisition performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
2. Asset creation and acquisition	B	2
2.1 Full project evaluations are undertaken for new assets, including comparative assessment of non- asset options	A	1
2.2 Evaluations include all life-cycle costs	A	1
2.3 Projects reflect sound engineering and business decisions.	A	1
2.4 Commissioning tests are documented and completed	A	1
2.5 Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood	B	2

5.2.2 Observations

General

Asset creation within AGA is normally initiated by an end-user customer request, third-party customer request or through AGAs asset planning resulting from usage forecasting (Refer above, 5.1 Asset planning).

AGA Engineering Services provide the technical expertise and oversight for demand management, engineering for new infrastructure, and improvement of existing infrastructure. Operations (Capital Infrastructure) are responsible for project delivery including delivery of new assets and improvement projects.

Project delivery is undertaken in accordance the Project Management Manual PPM MA00001. The manual details the process for project initiation, planning, delivery, and closure. The manual was cited and reviewed against sample documentation from some randomly selected projects to validate compliance. Projects consistently demonstrated compliance with the manual.

Element 2.1 Full project evaluations are undertaken for new assets, including comparative assessment of non-asset options. The Project Management Manual PPM MA00001 establishes the criteria for project evaluations. Determining the requirement for new infrastructure occurs through internal network assessment and customer-initiated requests. Internal assessment determines if network reinforcement is required through installation of new or replacement infrastructure, or through non-asset options. Annual modelling provides forecasting to justify new infrastructure and condition assessment determines replacement or upgrade requirements.

The modelling tool was cited as evidence of forecasting assessment. The project documentation of the Como Reinforcement Project was reviewed to confirm compliance to the Project Management Manual and to determine practical effectiveness of a project evaluation. Evidence was cited for consideration of asset and non-asset options in the business case.

Element 2.2 Evaluations include all life-cycle costs. Project evaluations during the initiation phase are to include all life-cycle costs, as part of option selection, in accordance with the Project Management Manual PMM MA00001, Section 3.2. As stated in the manual, "This Phase requires appropriate methods, techniques, tools and competent human resources to undertake relevant high-level assessments, such as: preliminary market analysis, technical analysis, and whole of life cost estimation. At the completion of this stage, a decision is made whether the idea adds value and/or mitigates risks and development of the solution (or several possible solutions) should be continued, or to cancel further work."

The Net Present Value (NPV) assessment for the Como Reinforcement Project was cited as a demonstration of life-cycle cost assessment. This assessment was contained in spreadsheets which were provided for the review. They demonstrate life-cycle costing of the options was considered for this project. The spreadsheets were populated from standardised assessment templates for life-cycle cost assessments.

Element 2.3 Projects reflect sound engineering and business decisions. To ensure appropriate engineering decisions are made, authorisations must occur in accordance with the Delegation of Technical Authority procedure AGA-R&R-PR10-RG01. Multiple technical documents were cited to confirm compliance with the matrix; in each case the document was approved by the appropriate technical authority nominated in the procedure.

The Project Management Manual requires formal lessons-learned sessions to be conducted and documented. The manual also requires review of previous projects' lessons-learned at the start of projects. The document "Lessons Learnt – Infrastructure Upgrade – ILI Project" was cited as a demonstration of capturing lessons to be applied to future projects.

Engineering documentation was requested and provided for the PL106 inline inspection project. The Design Basis and HAZOP close-out register was reviewed and confirmed to demonstrate sound engineering considerations; assessment and close-out was conducted throughout the project.

The Como Reinforcement Project business case and Capital Expenditure Appropriation Request (CEAR) were reviewed; together they reflect evidence of sound business decisions and approvals in accordance with the asset management plan and approvals framework.

Element 2.4 Commissioning tests are documented. Commissioning test sample documents from the Pigging Project and Como Reinforcement were reviewed. The following support documentation was reviewed as demonstration of commissioning test completion and documentation:

- Major Work Permit, PRS009 – PL106 Inline Inspection Facility Upgrade PRS009
- Manufacturers data report (MDR), 3024-MDR-QA-001-1-A-IFA, including the onsite construction and ILI support report
- Samples of completed documentation of two customer sites were cited as demonstration of completion.

Element 2.5 Ongoing legal, environmental and safety obligations of the asset owner are assigned and understood. Regulatory obligations are tracked, with responsibility assignment, by means of an obligation register spreadsheet which was reviewed during the interviews.

Legal information was cited within the Como Reinforcement Project business case to confirm project-specific understanding of obligations (Section 5, page 20, of the business case).

While tracking of legal, environmental and safety obligations appears to be effective in the examples cited, tracking occurs by means of various spreadsheets which lack the control and traceability available through database and workflow software, leaving the spreadsheet data susceptible to human error.

5.2.3 Process recommendations

The key recommendations are provided in Table 8.

Table 8 - Recommendations for asset creation and acquisition

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
2	**Asset creation and acquisition** Asset creation/acquisition is the provision or improvement of assets.			B	2
2.1	Full project evaluations are undertaken for new assets, including comparative assessment of non- asset options	4	Requirement fulfilled.	A	1
2.2	Evaluations include all life-cycle costs	4	Requirement fulfilled.	A	1
2.3	Projects reflect sound engineering and business decisions.	4	Requirement fulfilled.	A	1
2.4	Commissioning tests are documented and completed	4	Requirement fulfilled.	A	1
2.5	Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood	4	Observation: While tracking of legal, environmental and safety obligations appears to be effective in the examples cited, it occurs by means of various spreadsheets which lack the control and traceability available through database and workflow software, leaving the data susceptible to human error. AGA should consider using a database and workflow software for consolidating and managing legal, environmental and safety obligations.	B	2

5.3 Asset disposal (Asset Management Element #3)

5.3.1 Licensee's Performance Summary

The intended purpose and outcome of the asset disposal element are:

- Purpose - "Asset disposal is the consideration of alternatives for the disposal of surplus."
- Outcome - "The asset acquisition framework is economic, efficient and cost-effective; it reduces demand for new assets, lowers service costs and improves service delivery."

The performance summary for asset disposal is set out in Table 9.

Table 9 - Asset disposal performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
3. Asset disposal	A	1
3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process	A	1
3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	A	1
3.3 Disposal alternatives are evaluated	A	1
3.4 There is a replacement strategy for assets	A	1

5.3.2 Observations

General

AGA's processes for disposal considerations follow the same processes as those outlined above in Section 5.2. Asset disposal within AGA is normally initiated by an end-user customer request, third-party customer request or through AGAs asset planning resulting from usage forecasting (Refer above, 5.1 Asset planning). Additionally, remaining life assessments, which occur prior to end of design life, identify assets for disposal, replacement or refurbishment. AGA Engineering Services provide the technical oversight and Operations (Capital Infrastructure) are responsible for project delivery including asset disposals. Disposals are undertaken in accordance the Project Management Manual PPM MA00001 and the Management of Decommissioned Assets procedure AGA-ENG-GL12 which details disposal and abandonment requirements for assets. The two disposal projects reviewed demonstrated compliance with the manual.

Element 3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process. Systematic internal assessment determines if infrastructure is being under-utilised, requiring abandonment or disposal. Additionally, end of life assessment of infrastructure occurs at the completion of an asset's lifecycle. Systematic modelling and end-of-life review identifies under-utilised and under-performing assets. The modelling tool, as well as the end-of-life list and assessment tool, were cited as evidence of effective systematic review.

Element 3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken. The network modelling tool and condition assessment list and tool were cited as evidence of ongoing assessment of assets to identify poor performance. The Como Reinforcement Project and Geraldton Footbridge project were cited as examples of corrective and disposal actions taken, respectively.

Element 3.3 Disposal alternatives are evaluated. The Como Reinforcement project business case and net present value assessment spreadsheets were cited as evidence of alternatives evaluated.

Element 3.4 There is a replacement strategy for assets. The Mains Replacement Prioritisation Tool was reviewed, it provides an estimation of linear asset replacement costs and feeds into the business plan. An example was reviewed (Pipelines Mains AGA-S&P-ST08) showing the connectivity of the Mains Replacement Tool, the asset lifecycle strategy, and the budget. The Como Reinforcement project was reviewed and serves as evidence that replacement strategy exists for assets. The project involved increasing the capacity of the network, through increasing the pipeline size, for a pipeline approaching capacity. The pipeline replacement assessment tool was also cited.

5.3.3 Process recommendations

The key recommendations are provided in Table 10.

Table 10 - Recommendations for asset disposal

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
3	**Asset disposal** Asset disposal is the consideration of alternatives for the disposal of surplus.			A	1
3.1	Under-utilised and under-performing assets are identified as part of a regular systematic review process	5	Requirement fulfilled.	A	1
3.2	The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	5	Requirement fulfilled.	A	1
3.3	Disposal alternatives are evaluated	5	Requirement fulfilled.	A	1
3.4	There is a replacement strategy for assets	5	Requirement fulfilled.	A	1

5.4 Environmental (Asset Management Element #4)

5.4.1 Licensee's Performance Summary

The intended purpose and outcome of the environmental element are:

- Purpose - "Environmental analysis examines the asset management system environment and assesses all external factors affecting the asset management system."
- Outcome - "The asset management system regularly assesses external opportunities and threats and identifies corrective action to maintain performance requirements."

The performance summary for environmental performance is set out in Table 11.

Table 11 - Environmental performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
4. Environmental	A	2
4.1 Opportunities and threats in the asset management system environment are assessed	A	1
4.2 Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	A	1
4.3 Compliance with statutory and regulatory requirements	B	2
4.4 Service standard (customer service levels etc) are measured and achieved.	A	1

5.4.2 Observations

General
A presentation was provided summarising the environmental factors and management strategy.

Access to gas infrastructure is governed by the National Gas Law (NGL) and National Gas Rules (NGR). The economic regulator (ERA in Western Australia) reviews ATCO's performance and prices.
During an access arrangement review, the Regulator assesses how much revenue should be earned during a defined period (typically 5 years). Revenue assessment is used to set prices or revenue. Forecast for the 5-year program from ATCO is submitted annually to the regulator.

Network safety is regulated under the Gas Standards Act, and the Gas Standards (Gas Supply and System Safety) Regulations 2000 (WA), which requires the production of a Safety Case. AGA has in place Gas Distribution System (GDS) and Mandurah Gas Lateral (MGL) Safety Cases.

These Safety Cases establish how AGA are to meet the legislative requirements for managing safety; and in the case of the GDS, managing impact on supply and the environment.

Element 4.1 Opportunities and threats in the asset management system environment are assessed. Opportunities and threats, identified from forecasting and customer requests, are discussed in more detail elsewhere in this report (refer to Section 5.1 and 5.2). Opportunities and threats arising from regulatory changes are realised though ongoing tracking of regulatory changes and are discussed further below.

Element 4.2 Performance standards are measured and achieved. The Internal KPI report Operational Key Performance Indicator document (AGA-S&P-DS01-ATCO) was presented showing tracking and reporting of key performance standards. Additionally, ERA's website contained AGA's Annual Performance Report, demonstrating the report had been lodged with the regulator and published on their website. It included the Annual Performance Report - Energy Distribution 2017/18 (Refer pages

62,63). The Gas Distribution Licence Report (Excel Spreadsheet) was also presented which assimilates organisational data information to generate the report from AGA to the Regulator.

During field review at Bunbury, examples of a field works with associated performance standards were cited:

- Meter and Regulator Activities (MRA) - Meter Installations ≤10m3/h (AGA-SWI-MRA21)
- Pipeline Installation Depth of Cover (ENS WI023).

Element 4.3 Compliance with statutory and regulatory requirements is tracked through the Master Obligation Register which captures key compliance obligations, the associated legislation, the compliance requirement, the controls, the penalties and sanctions, associated issues and assignment of responsibility. Each senior manager with specific compliance responsibilities updates the register and is responsible for compliance of their respective elements. The register is an excel spreadsheet which is potentially susceptible to human error compared to alternative software options; it lacks traceability and workflow options in managing compliance obligations identification, action assignment, action management and review. Consideration may be given to alternative software options that enable workflow management with the advantages of a supporting database. The spreadsheet did not have a date filter option making it difficult to reconcile with regulatory and other changes based on the date of change.

A Compliance Attestation document is signed off every six months, individually by senior managers with ownership of compliance obligations, to confirm they have each reviewed and updated the Master Obligations Register and have either met their respective compliance obligations, or reported the non-compliances to Risk and Compliance Team. The Compliance Attestation for the Manager of Asset Services was cited.

The Statutory and Regulatory Change Report was reviewed, it is an extract from the Risk Management and Compliance Committee report containing details of obligation changes and draft changes with impact assessments and associated action plans. The Risk Management and Compliance Committee meet quarterly (check) and are made of AGA's senior management team.

Compliance Breach Reporting was also sampled by the review team.

Element 4.4 Service standards are measured and achieved. In instances where this is not the case, the incident is reported with mitigations implemented. An example from the compliance report was cited where it is an obligation to reconnect customers in two business days, and in ten days if excavation is required. The wrong application of a KPI caused process delays resulting in the exceeding of the allotted time for the task. Internal improvement in the process was implemented to overcome the issue.

The Internal KPI report, Operational Key Performance Indicator (AGA-S&P-DS01-ATCO) was presented which tracks performance against service standards.

5.4.3 Process recommendations

The key recommendations are provided in Table 12.

Table 12 - Recommendations for environmental performance

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
4	**Environmental** Environmental analysis examines the asset management system environment and assesses all external factors affecting the asset management system.			A	2
4.1	Opportunities and threats in the asset management system environment are assessed	4	Requirement fulfilled.	A	1
4.2	Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	4	Requirement fulfilled.	A	1
4.3	Compliance with statutory and regulatory requirements	4	Observation: The Master Obligation Register was reviewed. The register is an excel spreadsheet which is potentially susceptible to human error compared to alternative software options; it lacks traceability and workflow options in managing compliance obligations identification, action assignment, action management and review. AGA should consider an alternative software option that enables workflow management with the advantages of a supporting database. Observation: The spreadsheet did not have a date filter option making it difficult to reconcile with regulatory and other changes based on the date of change. AGA should consider tracking changes by date on the Master Obligations Register. This makes it easier to reconcile with regulatory and other changes.	B	2
4.4	Service standard (customer service levels etc) are measured and achieved.	4	Requirement fulfilled.	A	1

5.5 Asset operations (Asset Management Element #5)

5.5.1 Licensee's Performance Summary

The intended purpose and outcome of the asset operations process element are:

- Purpose - "Asset operations is the day-to-day running of assets (where the asset is used for its intended purpose)."
- Outcome - "The asset operation plans adequately document the processes and knowledge of staff in the operation of assets so service levels can be consistently achieved."

The performance summary for asset operations performance is set out in Table 13.

Table 13 - Asset operations performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
5. Asset operations	A	1
5.1 Operational policies and procedures are documented and linked to service levels required	A	1
5.2 Risk management is applied to prioritise operations tasks	A	1
5.3 Assets are documented in an asset register including asset type, location, material, plans of components, and an assessment of assets' physical/structural condition	A	1
5.4 Accounting data is documented for assets	A	1
5.5 Operational costs are measured and monitored	A	1
5.6 Staff resources are adequate and staff receive training commensurate with their responsibilities	A	1

5.5.2 Observations

General

Operation for each area occurs within the framework provided by the Safety Case, the Asset Management Plan, the Asset Lifecycle Strategies, and the Asset Class Plans. The Field Operations Manual Index (AGA-GRC-RG02) and Customer Service Manual Index (AGA-GRC-RG03) together list over 200 documents which cover the technical and procedural details relevant to daily operation.

AGA operation involves generation of activity, integrated into the SAP software system, for the assigned asset, assessing and dispatching resources, asset maintenance, assessment, monitoring and reporting.

The key functions within AGA Asset Operation are:

- Management to ensure the policies and procedures are adhered to and resources are adequate to ensure service level delivery
- Call Centre for customer inquiries and emergency calls
- Data Management to monitor network and facilities, and report faults and issues
- Asset Services to deliver the maintenance plans
- Planning to implement maintenance schedules, plan future works and emergency response
- Control Room to assess emergency response & escalation, dispatch, manage permitting, field enquiries and network reliability
- Customer Service & Maintenance which are field based personnel that attend planned work, faults and emergency activities
- Systems Monitoring to maintain network monitoring devices and repair faults and upgrades
- Pipeline & Facilities Maintenance to manage high pressure pipeline maintenance, facility maintenance, gas sampling and emergency response.

Operational policies and procedures are documented and linked to service levels required. Risk management is applied to prioritise operations tasks. Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural condition and accounting data. And staff receive training commensurate with their responsibilities.

Element 5.1 Operational policies and procedures are documented and linked to service levels required. The following documents were reviewed to confirm linkages to services levels:

- Network Maintenance Strategy - AST ST0002
- Network Maintenance Planning Strategy - AST ST0003
- Network Operating Strategy - AST ST0004
- Network Monitoring Strategy - AST ST0006
- Site Safety and Environment Prerequisite Course - TRN MA00003
- SWI Review and Sign Off Process - QLT PR 0007 (AGA-GRC-PR06).
- ACP - Pressure Regulation Facilities AST PL00012: AGA-S&P-ST09.
- ACP - Pipelines, Mains & Services AST PL00009: AGA-S&P-ST08.

Procedures are updated as per the Controlled Document Register which was cited with examples reviewed (Register_AMS extract.pdf). The procedure for document control was reviewed, Document Control Procedure (AA-GRC-PR02). The OpenText document management platform was also reviewed. Document Control is further discussed in Section 5.7.

Element 5.2 Risk management is applied to prioritise operations tasks. Broad assessment of risk and prioritisation of tasks is evident within plans and strategies. Pipeline criticality is well understood from network monitoring and modelling.

The incident escalation process was reviewed. Incidents are documented and captured in SAP.
A call is received and redirected to the Control Room which in turn dispatch operations personnel, if needed, so the issue may be assessed. Further personnel may be dispatched, as required. A random example of a notification in SAP was cited relating to water intrusion without gas flow. The notification included the address, the type of job, with comments provided by those involved.

An example of a broken mains emergency response was also reviewed. The response time was approximately one hours (two hours allowed by Regulation / AS 4645). SAP automatically sets the priority regarding the type of works. However, situations are continually monitored, and manual change is undertaken, if required.

The In-line Inspection capability upgrade of two class 600 pipelines (PL21 and PL8) demonstrates continuous improvement in seeking to understand risk profile.

Management of risk was also evident in the field. A random site visit was conducted to review field work in progress, at 54 Vittoria Rd, Glen Iris, WA, 6230, under the oversight of The Regional Customer Service and Maintenance Technician. A task was underway to confirm operations testing, for the work performed in the area, as an extension of systems to facilitate gas to a government property (South West Community Mental Health Facility). We reviewed a Take-5 HAZID form and received an explanation for the task performed identifying the different possible hazards and control measures to decrease the risk. The nature of the work did not require a formal Risk Assessment as work was only for an inspection of contractors' works. A review of the site and equipment indicated an appropriate level of PPE and safety equipment – a gas alarm was present and confirmed to be turned on; the worker had gloves, steel cap boots, cotton pants, shirt, hat, and protective eyewear sunglasses. The vehicle was parked safely with safety signage visible. The vehicle and trailer contents were reviewed, the vehicle was stocked for standard gas work as well as leak detection works.

Further risk management detail is provided in Section 5.6 and 5.8 below.

Element 5.3 Assets are documented in an asset register including asset type, location, material, plans of components, and an assessment of assets' physical/structural condition. Asset details were reviewed through randomly selected samples in the field with both operators and planners.

Sample maintenance plans, and related SAP software entries, were reviewed with an example of the plan followed through to execution and close-out. The plan is dynamically integrated with field operations digital toolkit providing both historical and real-time data.

An example of Call Centre capabilities was reviewed. Examples were cited of call centre responses to confirm the ability to identify the location within the asset register and gather site-specific data through the ATCO IBIS map system. Various locations across Jandakot Area were reviewed (such as Rimmington Court, one of the locations reviewed in detail). In each case, the location-specific data and history appeared captured and available. The Job Safety Location field within the software was seen to provide information from previous works performed at the specific location.

Element 5.4 Accounting data is documented for assets. Accounting data was presented through exports into spreadsheets as well as screenshots of accounting information sources. More detail is provided in Section 5.7 below.

Element 5.5 Operational costs are measured and monitored. Cost measurement and monitoring exports and software screens were shown to the review team. More detail is provided in Section 5.7 below.

Element 5.6 Staff resources are adequate, and staff receive training is commensurate with their responsibilities. The Training Management Process (TRN PR0001) and some related associated documentation was reviewed to confirm clear training processes. Training is managed and tracked in SAP. Training records and examples were sited.

Although training records are captured in SAP, capability mapping to task activities is undertaken in a separate spreadsheet; work assignment is therefore based on the Supervisors knowledge of employee skillsets. A gap analysis of training capability was presented during the site interview of the Bunbury Supervisor which confirmed capability tracking was being managed. The review team undertook the following two additional sample checks to verify adequate capture of training.

Firstly, an individual training record was cited and reviewed to confirm training was commensurate with responsibilities. The training requirements did match the technician responsibilities. As one training course was overdue, a separately kept spreadsheet record clearly showed which activities the individual was unable to perform until the course was completed. The reason for the overdue course was demonstrated to be extended leave.

Secondly, the Site Safety and Environment Prerequisite course (TRN MA00003) was selected to verify it had been rolled-out appropriately across the organisation, individuals were identified who needed to attend, and attendance was documented.

AGA conduct their own technician training in their Jandakot facility with six dedicated training staff in total. Some training is supplemented by specialist training organisations. The training areas were reviewed, they are set up for training in common technician tasks (excavation, repair, metering etc).

5.5.3 Process recommendations

The key recommendations are provided in Table 14.

Table 14 - Recommendations for asset operations

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
5	**Asset operations** Asset operations is the day-to-day running of assets (where the asset is used for its intended purpose).			A	1
5.1	Operational policies and procedures are documented and linked to service levels required	2	Requirement fulfilled.	A	1
5.2	Risk management is applied to prioritise operations tasks	2	Requirement fulfilled.	A	1
5.3	Assets are documented in an asset register including asset type, location, material, plans of components, and an assessment of assets' physical/structural condition	2	Requirement fulfilled.	A	1
5.4	Accounting data is documented for assets	2	Requirement fulfilled.	A	1
5.5	Operational costs are measured and monitored	2	Requirement fulfilled.	A	1
5.6	Staff resources are adequate and staff receive training commensurate with their responsibilities	2	Requirement fulfilled.	A	1

5.6 Asset maintenance (Asset Management Element #6)

5.6.1 Licensee's Performance Summary

In accordance with Table 23 of the 2019 Audit and Review Guidelines (Electricity and Gas Licenses), the intended purpose and outcome of the asset maintenance process element are:

- Purpose - "Asset maintenance is the upkeep of assets."
- Outcome - "The asset maintenance plans cover the scheduling and resourcing of the maintenance tasks so work can be done on time and on cost."

The performance summary for asset maintenance performance is set out in Table 15.

Table 15 - Asset maintenance performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
6. Asset maintenance	A	1
6.1 Maintenance policies and procedures are documented and linked to service levels required	A	1
6.2 Regular inspections are undertaken of asset performance and condition	A	1
6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	A	1
6.4 Failures are analysed and operational/maintenance plans adjusted where necessary	B	2
6.5 Risk management is applied to prioritise maintenance tasks	A	1
6.6 Maintenance costs are measured and monitored	A	1

5.6.2 Observations

General

Asset operation and maintenance processes are integrated processes within AGA. This section should be read in conjunction with Section 5.6 which describes the same overall framework within which maintenance occurs. Maintenance aspects are expanded here by exception.

Maintenance activities are linked to the assets and are generated from the associated Asset Maintenance Plan, Asset Lifecycle Strategies, and field report activities. These activities are managed through the SAP integrated platform.

Element 6.1 Maintenance policies and procedures are documented and linked to service levels required. The following documents were reviewed to confirm linkages to services levels:

- Network Maintenance Strategy - AST ST0002
- Network Maintenance Planning Strategy - AST ST0003
- Network Monitoring Strategy - AST ST0006

Element 6.2 Regular inspections are undertaken of asset performance, and condition inspection requirements are captured in Asset Lifecycle Strategies. Sample inspections were cited in SAP as well associated documentation in the field including a metering check being performed at 8 Paisley Street. Other example of completed works as well as work in progress were cited. In each case the maintenance activities were consistent with the plans and SAP activities. Examples of weekly patrols were cited including the patrol schedule and reports for the Lateral Area on pipeline located South-East of Bunbury.

Element 6.3 Maintenance plans (emergency, corrective and preventative) are documented and appear to be completed on schedule. The following Maintenance plans were provided and reviewed:

- Strategic Asset Management Plan (AGA-S&P-PL01)
- Asset Management Plan – Coastal (AGA-S&P-PL02)
- Asset Management Plan – Albany (AGA-S&P-PL03)
- Asset Management Plan – Kalgoorlie (AGA-S&P-PL04)

The incident escalation process was reviewed as well as an example of cases going through the Call Centre. Examples were traced from the call centre through to entry into SAP and matching associated data in the ATCO IBIS map system for corrective and preventive maintenance cases. The review indicated implementation of documented plans, and completion of tasks, and close-out.

The following examples of completed corrective measures were cited:

- Damaged fence - (Examples 05 06 - Sub folder PRS012 Fence)
- Incident report - Loss of Gas Supply HRN48.

They were each completed and closed out appropriately.

Element 6.4 Failures are analysed, and operational/maintenance plans are adjusted where necessary. An example of failure mode and effects analysis (FMEA) was provided and reviewed, Regulator Setting Tube (TCO RP 0331), Rev 0. While examples of FMEA occurring can be demonstrated, clear linkages between specific equipment criticality and risk could be improved through comprehensive failure mode effects and criticality assessment (FMECA) which links risk assessment to SAP entries, documented in a database.

Refer also to Section 5.5 and Section 5.8 where failure assessment is also discussed.

Element 6.5 Risk management is applied to prioritise maintenance tasks. The Technical Compliance Risk Management procedure was reviewed (TCO GL0001) as well as the associated Action Tracking Register which tracks Corrective Action Recommendations (CARs) and Improvement Recommendations (IRs) identified through audit, inspection, and incidents. The tracking register is discussed further in Section 5.8 below. Formal Safety Assessments were cited in use for maintenance tasks including conducting HAZOPs and engineering assessment to maintenance deviations. Formal Hazard Identification (HAZIDs) is applied to location-specific maintenance activities. Examples were cited in both office documentation and during field works.

Examples of prioritised works were cited, such as an example of a class 1 leak receiving priority attention prior to other maintenance work.

Refer to Section 5.5 and Section 5.8 where risk assessment is discussed in further detail.

Element 6.6 Maintenance costs are measured and monitored. Evidence that service levels and costs are captured, monitored and reported was cited from SAP and operation/maintenance cost reports. The document Business Case (Growth and Maintenance CAPEX) Template (FIN PR0003) was cited which is required by the Technical Compliance Risk Management procedure (TCO GL0001). An example of a populated template was reviewed, AS2885 Pigging Infrastructure - PL28 Harrow St (1521-2017-GCA1-NM-039). The associated approved business case and capital expenditure and appropriate request (CEAR) were reviewed and were found to be appropriately completed.

5.6.3 Process recommendations

The key recommendations are provided in Table 16.

Table 16 - Recommendations for asset maintenance

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
6	**Asset maintenance** Asset maintenance is the upkeep of assets.			A	1
6.1	Maintenance policies and procedures are documented and linked to service levels required	2	Requirement fulfilled.	A	1
6.2	Regular inspections are undertaken of asset performance and condition	2	Requirement fulfilled.	A	1
6.3	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	2	Requirement fulfilled.	A	1
6.4	Failures are analysed and operational/maintenance plans adjusted where necessary	2	Observation: Clear linkages between specific equipment criticality and risk (such as the organisation risk matrix) could be improved through comprehensive failure mode effects and criticality assessment (FMECA) which links risk assessment to SAP entries, documented in a database. AGA should consider implementation of systematic Failure Mode and Effects Analysis, by reliability engineering and maintenance staff, ensuring clear linkages between equipment criticality and risk (e.g. organisational risk matrix), documented in a database.	B	2
6.5	Risk management is applied to prioritise maintenance tasks	2	Requirement fulfilled.	A	1
6.6	Maintenance costs are measured and monitored	2	Requirement fulfilled.	A	1

5.7 Asset management information system (Asset Management Element #7)

5.7.1 Licensee's Performance Summary

The intended purpose and outcome of the asset management information system element are:

- Purpose - "An asset management information system is a combination of processes, data and software supporting the asset management functions."
- Outcome - "The asset management information system provides authorised, complete and accurate information for the day-to-day running of the asset management system. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards."

The performance summary for asset information management system is set out in Table 17.

Table 17 - Asset management information system performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
7. Asset information management system	A	2
7.1 Adequate system documentation for users and IT operators	A	1
7.2 Input controls include suitable verification and validation of data entered into the system	A	2
7.3 Security access controls appear adequate, such as passwords	A	1
7.4 Physical security access controls appear adequate	A	1
7.5 Data backup procedures appear adequate and backups are tested	A	2
7.6 Computations for licensee performance reporting are accurate	A	1
7.7 Management reports appear adequate for the licensee to monitor licence obligations	A	1
7.8 Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	A	1

5.7.2 Observations

General

AGA operates under their Information Management Governance Framework (AA-GOV-FWK-01), updated 2016.

AGA utilise service providers and software solutions to undergird their IT information systems, including the following:

- AGA has a 10-year agreement with an external IT systems management organisation, Wipro, which includes provision of the following services: Voice (phones and call centre), Data Network, IT Security, Server Hosting, Desktop PC Infrastructure, Storage Services, Application Database, and application development. All these systems were either cited or utilised during the review to confirm they are functioning.
- Asset Information Request System for Dial Before You Dig (AIRS – DBYD) is provided by PelicanCorp Software. The software was cited during the review to confirm use and effectiveness.
- Their document management system (EIM) utilises OpenText software which was utilised by the review team.
- SynerGEE software supports network modelling and planning; model use was verified during the review.

- Toughbook tablets with integrated supporting software provide field mobility to AGA's field operators. Use by three separate field staff was witnessed in the field by the review team.
- WebMethods and Gateway third party software provides middleware integration software to link exchange between internal systems and external customers. A demonstration was provided to the review team.
- The Gas Network Information System (GNIS) collates third-party solutions integrated to provide various real time data, such as: vehicle tracking; network infrastructure; GIS and other spatial data. A demonstration was provided to the review team.
- Gas Distribution Billing and Data Verification software to monitor metering, metering validations, and consumption data for commercial customers.
- GMD application for management of gas monitoring data recorded by field devices around the network.
- A web-based application, Gas Inflow Management System, to collect data from operators and calculate daily inflows. A demonstration was provided to the review team.
- Geomant Contact Expert, a multi-media contact centre solution that integrates with Microsoft's Unified Communications platform. A demonstration was provided to the review team.
- SAP provides capability to manage financial, asset, cost accounting, materials, personnel and plants. The various elements of SAP were reviewed.
- Interval Metering Data (IMD) website, utilised to retrieve industrial meter-set data for billing purposes.
- Network Data Visualisation (NVD – Neon Server), a third-party system and hardware to monitor industrial telemetered sites and pressure monitoring devices.
- Network Management Information Systems (NMIS) Hansen Hub, a third-party billing system used to process meter reads for residential commercial customers, billing for all customers, and manage service order transactions.

IT disaster recovery is supported by a disaster recovery centre at Belmont to provide redundancy for the primary data centre in Perth CBD. Additional redundancy of systems is established at each data centre.

Data is backed up to the Disaster Recovery data centre at appropriate data retention periods. Wipro owns the hardware including backup systems.

Information management is controlled through storage of documents in master copy folder in Open Text EIM.

The IT Performance Reporting procedure was cited during the review as well as sample performance reporting.

Cyber software security is frequently subjected to separate audits and tests through the year. Test schedule and sample reports were cited by the review team.

The volume and integration of data managed by AGA is complex and extensive. The systems and software sampled during the review indicate they collectively provide authorised, complete and accurate information for the day-to-day running of the asset management system.

Element 7.1 Adequate system documentation exists for users and IT operators. Random samples were requested and reviewed, from the document control system, for evidence of adequate system documentation for users and IT operators.

Element 7.2 Input controls include suitable verification and validation of data entering the system. During reviews of various software tools sited above, the systems confirmed input controls included suitable verification and validation of data.

Information management is controlled through storage of documents in a master copy folder in Open Text EIM in accordance with the Integrated System Management Manual (AGA-GRC-PR04). It is centrally managed through information management coordinators by use of a register of controlled documents. Document review and approval is not digitally automated or captured through wet signatures of hardcopy documents; rather, document controllers are provided evidence of approval which is often an email attachment. This method is susceptible to human error and could be improved by streamlining the document registration, review and approval process automatically in OpenText.

Element 7.3 Security access controls appear adequate, such as passwords. Different levels of security were demonstrated to, and tested by, the review team confirming secure controls for building and software access. Passwords are required to be changed every 45 days. Swipe cards are managed by the facilities team. Cards provide restricted access to facilities and rooms within facilities (e.g. control room).

Element 7.4 Physical security access controls appear adequate. Facility review confirmed physical access controls were adequate for typical security breaches.

Element 7.5 Data backup procedures appear adequate. Data backup relies upon the third party, Wipro. Backup reports and a daily backup confirmation email was cited during the review. AGA advised they do not do random sampling of backups to validate back-up integrity.

Element 7.6 Computations for licensee performance reporting appear accurate. The computations sampled relied on validation equipment in the computations. Readings are also validated against the model which was cited. An exception report was also cited which provided evidence of AGA review and reconciliation of data inconsistency.

Element 7.7 Management reports appear adequate for the licensee to monitor licence obligations. Management, performance, audit, and backup reports were cited during the review; reports appear adequate for the licensee to monitor licence obligations. Computation for licensee performance is verified by historical data. Data is extracted from SAP, then is validated by personnel to comply with ERA definitions.

The Historical Performance Report was reviewed. If changes are +/- 10% a reason is provided (samples cited). Visual validation of data is performed on site, other validation is completed through field checks communicated via mobility devices. An example of the process for Cast Iron pipeline replacement with PE pipelines was cited as an example of an automated process in SAP.

Annual information is collated into ERA's Energy Distribution Annual Report - Gas Distribution Performance which was cited.

Element 7.8 Adequate measures are in place to protect asset management data from unauthorised access or theft by persons outside the organisation. Multiple layers of physical and software security were cited as evidence of protection of asset management data from theft or unauthorised persons.

5.7.3 Process recommendations

The key recommendations are provided in Table 18.

Table 18 - Recommendations for asset management information system

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
7	**Asset management information system** An asset management information system is a combination of processes, data and software supporting the asset management functions.			A	2
7.1	Adequate system documentation for users and IT operators	4	Requirement fulfilled.	A	1
7.2	Input controls include suitable verification and validation of data entered into the system	4	Requirement fulfilled. Observation: Information management is controlled through storage of documents in master copy folder in Open Text EIM in accordance with the Integrated System Management Manual (AGA-GRC-PR04). It is centrally managed through information management coordinators by use of a register of controlled documents. Document review and approval is not digitally automated or captured through wet signatures of hardcopy documents; rather, document controllers are provided evidence of approval which is often an email attachment. This method is susceptible to human error and could be improved by streamlining the document registration, review and approval process automatically in OpenText. AGA should streamline document registration, review and approval through automating within OpenText.	A	2
7.3	Security access controls appear adequate, such as passwords	4	Requirement fulfilled.	A	1
7.4	Physical security access controls appear adequate	4	Requirement fulfilled.	A	1
7.5	Data backup procedures appear adequate and backups are tested	4	Observation: AGA advised they do not do random sampling of backups to verify backup integrity. AGA should perform random sampling of data backups to validate backup integrity.	A	2
7.6	Computations for licensee performance reporting are accurate	4	Requirement fulfilled.	A	1
7.7	Management reports appear adequate for the licensee to monitor licence obligations	4	Requirement fulfilled.	A	1
7.8	Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	4	Requirement fulfilled.	A	1

5.8 Risk Management (Asset Management Element #8)

5.8.1 Licensee's Performance Summary

The intended purpose and outcome of the risk management element are:

- Purpose - "Risk management involves the identification of risks and their management within an acceptable level of risk."
- Outcome - "The risk management framework effectively manages the risk that the licensee does not maintain effective service standards."

The performance summary for risk management is set out in Table 19.

Table 19 - Risk management performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
8. Risk management	B	3
8.1 Risk management policies and procedures exist and are applied to minimise internal and external risks	B	3
8.2 Risks are documented in a risk register and treatment plans are implemented and monitored	B	3
8.3 Probability and consequences of asset failure are regularly assessed	B	2

5.8.2 Observations

General

The framework for risk management is covered by ATCO Group documents Risk and Control (A-08), ATCO Risk and Review Committee Mandate (F-07) and ATCO Audit Committee Mandate (F-02). Within this framework, AGA operate under the additional requirements documented in the Risk Management Committee Mandate (F-06), Risk Management and Compliance Committee (AA-GRC-CH-01), and the governing AGA Risk Management Framework (AA-GRC-PL05).

Risk within the ATCO Group is managed by ATCO Risk and Review Audit Committee, made up of ATCO's most senior leadership, establishing the organisational risk framework and overseeing risk management for the ATCO group of companies.

The AGA Corporate Risk and Compliance Team are responsible for the risk management framework within AGA, coordinating strategic level risk reviews, and risk-mitigation action tracking. The AGA Technical Compliance Team are responsible for coordinating the implementation of the Safety Case, formal safety assessment framework, coordinating formal safety assessments, and monitoring risk treatment actions.

Risk management policies and plans were reviewed as well as business documentation, such as operation meetings, project documentation, and various safety assessments. The review demonstrated a culture of risk-awareness and commitment to mitigation and management of risk.

Risk workshops are set to identify new risks and review actual risks. Risk Management & Compliance Committee (RMCC) receive risk reports (identifying high risks) from the Risk and Compliance team. It is then forwarded to the Risk Management Committee. Correspondence and meeting minutes were cited to confirm. The AGA Risk and Compliance Team follow the process of the Risk Management Governance Structure and Risk Management Framework through different risk review levels which are escalated up to ATCO Board for higher risks where required by the framework.

The Safety Assessment of the Gas Distribution System Safety Case was last submitted in 2017. An amendment to the Safety Case is planned to be submitted in 2020. The associated risk Matrix has been updated to align with AS 4645.

Element 8.1 Risk management policies and procedures exist and are applied to minimise internal and external risks. For AGA, Risk management is governed primary by the Risk Management Policy (AA-GRC-PO04), Risk Management Framework (AA-GRC-PL05), and the ATCO Gas Australia Risk Matrix (AGA-GRC-RG08). Throughout cited project documentation, key organisation governance meeting minutes and subordinate documentation, the application of the organisational policy and framework is evident.

The Delegation of Engineering Technical Authority (AGA-R&R-PR10-RG01) establishes approval requirements for technical decisions. The document was reviewed as well as two documents, randomly selected, to confirm application of the procedure:

- Manufacturer's Data Report Procedure (ENS-PR-0042)
- Engineering Quality Procedure (AGA-ENG-PR37)

Both documents had the appropriate technical authority approvals in accordance with the procedure.

The Management of Change process was reviewed (AGA-R&R-PR02) as well as three Management of Change applications (MoCs) including their mapping within the MoC Register:

- Hot Bolting Clamp MoC: Within the register, the MoC did not have all the required internal approvals prior to proceeding.
- GMI Frequency Calibration MoC: all approvals were in place.
- Leak Classification Change MoC: all approvals were in place.

During the interview, AGA advised that the Safety Case and the associated legislation, under which they are obligated to comply, references the 2012 editions of the standard AS 2885 Pipelines - Gas and Liquid Petroleum, and therefore AGA has not assessed or implemented the changes set out in the latest editions. While following the 2012 editions of the AS 2885 suite of standards achieves regulatory compliance, it potentially creates a gap in understanding risk exposures in managing their high pressure pipelines in accordance with latest industry insight and best practice which are represented in the latest editions of AS 2885. Changes in the latest editions of AS 2885 should be reviewed to identify new industry learnings and additional risks not previously identified.

The Hazard identification procedure was cited during the interview, as well as two live examples of Hazard Identification (referred to as 'Take5') during field works which demonstrated the implementation of the procedures by those most at risk in the organisation.

AGA's Stop Work policy was cited, which empowers all employees to stop work they consider unsafe. An example was cited of field works stopped demonstrating application of the policy. Related email correspondence was reviewed demonstrating an example of application of the procedure by use of an individual not in a management role. The issue was investigated and resolved so work could later proceed safely.

The example of the Albany LPG Plant Fencing Driveway Upgrade HAZID was reviewed, it demonstrated hazards had been identified, risks assessed, and controls assigned. The associated major works permit (TCO-RP-0342) and the hazard identification spreadsheet was reviewed. The documentation was completed except signed-off versions of the major works permit provided (TCO-RP-0342) were not available. Similarly, the Loss of Gas Supply HRN48 Regulating Facility Incident Report TRC-RP-0327 contained a copy of a permit in the report which did not include a completion sign-off. And the Major Work Permit, PRS009 – PL106 Inline Inspection Facility Upgrade cited was not signed-off as complete.

As documented in Section 5.5.2, risk management is applied in the field while undertaking tasks.

Element 8.2 Risks are documented in a risk register and treatment plans are implemented and monitored. The Corporate Risk Register was reviewed demonstrating tracking and reporting of risks.

One of the monthly safety focus presentations, given to all staff, was reviewed. Part of the focus is to share learnings from risks identified.

An example was selected by the reviewer to test the workflow of a formal safety assessment and to confirm appropriate documentation, storage, approval, action identification, and action close out. An example of an audit from 2018 was selected where the inspector commented that a pipeline was closer than the nominated distance from underground electrical consumer mains. The associated documentation within the document control system (EIM) was viewed showing the remediation process had occurred, including photographic evidence.

The reviewer requested information demonstrating the means by which AGA were assuring upstream protective measures were in place and safety critical maintenance was occurring on upstream assets, operated by third parties, upstream of their Pressure Reduction Stations (PSRs). This situation is not uncommon where downstream operators rely on the protective measures of upstream operators. The ATCO Gas Corporate Risk Register was cited as evidence the organisation had identified the associated risk and was in the process of completing the associated mitigation measures. Refer Risk ID 230 of the Corporate Risk Register.

The Technical Compliance Register (TCO R0003) was reviewed demonstrating capture of actions associated with audits, reviews, formal safety assessments, and incidents. The register is an excel spreadsheet which is potentially susceptible to human error compared to alternative software options; it lacks traceability and workflow options in managing compliance obligations identification, management, action assignment and review. Consideration may be given to alternative software options that enable workflow management with the advantages of a supporting database.

The register contains fields (columns) for the capturing of the associated risk levels, although these are not populated which limits the ability to determine the action priority based on associated risk levels.

The register contains over 2160 actions; 2110 are closed, 38 are open and not overdue, and 167 actions are listed as overdue (including 161 actions with revised due dates ranging from the year 2017 to 2019). It is recommended that overdue actions be resolved or re-assessed with revised dates assigned.

Element 8.3 The Probability and consequences of asset failure are regularly assessed. ATCO Gas Australia Risk Matrix (AGA-GRC-RG08) provides the procedure and tools for assessment of risk and prioritisation of actions.

During the review, the following procedures and associated examples were cited (at least one example for each procedure was cited):

- Permit to Work - TC0-PR007
- Major Works: JRA, Work Program.
- Minor Works
- Deep Excavation
- Hot Work
- Confine Space

In each case, forms and assessment had been completed and signed which demonstrates assessment and mitigation of risks in the field.

The Technical Compliance Register was checked and examples of HAZOPs and other formal safety assessments within the register were further examined. In each case, the samples selected demonstrated compliance.

The previous review reported a lack of guidance regarding triggers which escalate Permits to require job risk assessments stating this is at the discretion of personnel preparing the permit. The permit to work guideline requires that only Major Permits require a dedicated job risk assessment as Major Permits are utilised for works that do not have a Safe Work Instruction (or a change to a Safe Work Instruction). Additional escalation to a job risk assessment is not required in the guidelines although may be undertaken at the discretion of personnel preparing the permit. With respect to procedures requiring additional escalation of risk, often a balance needs to be found between providing prescriptive guidance and relying on the expertise of field operators. The reviewer found the level guidance to be adequate in this regard and does not view this as a procedural deficiency.

AGA have become members of the Pipeline Operators Group (POG) – a sub-committee of Australian Pipelines and Gas Association (APGA) in 2019. Through this association and memberships with other organisations such as Energy Networks Australia (ENA), AGA are building their knowledge base regarding pipeline infrastructure and asset integrity.

Failure Mode and Effects Analysis doesn't appear to be undertaken extensively across all plant and equipment; better application may improve identification and management of safety critical equipment as well as generally improve efficiency of the overall maintenance program.

5.8.3 Process recommendations

The key recommendations are provided in Table 20.

Table 20 - Recommendations for risk management

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
8	**Risk management** Risk management involves the identification of risks and their management within an acceptable level of risk.			B	3
8.1	Risk management policies and procedures exist and are applied to minimise internal and external risks	2	Corrective action required. Observation: The Hot Bolting Clamp MoC did not have all the required approvals prior to proceeding (this was not typical amongst the examples reviewed). AGA should ensure all MoCs receive the required approvals prior to implementation. Observation: During the interview, AGA advised that the Safety Case and the associated legislation, under which they are obligated to comply, references the 2012 editions of the standard AS 2885 Pipelines - Gas and Liquid Petroleum, and therefore AGA has not assessed or implemented the changes set out in the latest editions. While following the 2012 editions of the AS 2885 suite of standards achieves regulatory compliance, it potentially creates a gap in understanding risk exposures in managing high pressure pipelines in accordance with latest industry insight and best practice which are represented in the latest editions of AS 2885. Therefore, changes in the latest editions of AS 2885 should be reviewed to identify new industry learnings and additional risks not previously identified.	B (A) (A)	3 (2) (2)

			Observation: The following Permits cited during the review were not signed-off as completed: • Albany LPG Plant Fencing Driveway Upgrade major works permit (TCO-RP-0342) • Loss of Gas Supply HRN48 Regulating Facility Incident Report (TRC-RP-0327) contained a copy of a permit in the report which did not include a completion sign-off. • Major Work Permit, PRS009 – PL106 Inline Inspection Facility Upgrade. **Recommendation 01/2020:** Ensure sign-off of all risk related assessments is mandatory and implemented.	(B)	(3)
8.2	Risks are documented in a risk register and treatment plans are implemented and monitored	2	Corrective action required. Observation: The Technical Compliance Register (TCO R0003) was reviewed demonstrating capture of actions associated with audits, reviews, formal safety assessments, and incidents. The register is an excel spreadsheet which is potentially susceptible to human error compared to alternative software options; it lacks traceability and workflow options in managing compliance obligations identification, management, action assignment and review. AGA should consider alternative software options that enable workflow management with the advantages of a supporting database. Observation: The Technical Compliance Register (TCO R0003) contains fields (columns) for the capturing of the associated risk levels, although these are not populated which limits the ability to determine the action priority based on associated risk levels. AGA should populate the risk column of the Technical Compliance register to enable clear identification of action priority based on associated risk. Observation: The Technical Compliance Register (TCO R0003) contains over 2160 actions; 2110 are closed, 38 are open and not overdue, and 167 actions are listed as overdue (including 161 actions with revised due dates ranging from the year 2017 to 2019). **Recommendation 02/2020:** It is recommended that overdue actions be resolved or re-assessed with revised due dates assigned.	B (B) (B) (B)	3 (2) (2) (3)
8.3	Probability and consequences of asset failure are regularly assessed	2	Observation: Failure Mode and Effects Analysis does not appear to be undertaken across all plant and equipment; better application may improve identification and management of safety critical equipment (as well as generally improve efficiency of the overall maintenance program). AGA should consider implementation of systematic Failure Mode and Effects Analysis, by reliability engineering and maintenance staff, ensuring clear linkages between equipment criticality and risk (e.g. organisational risk matrix), documented in a database.	B	2

5.9 Contingency Planning (Asset Management Element #9)

5.9.1 Licensee's Performance Summary

The intended purpose and outcome of the contingency planning element are:

- Purpose - "Contingency plans document the steps to deal with the unexpected failure of an asset."
- Outcome - "Contingency plans have been developed and tested to minimise any major disruptions to service standards."

The performance summary for contingency planning is set out in Table 21.

Table 21 - Contingency planning performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
9. Contingency planning	A	2
9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	A	2

5.9.2 Observations

Within the asset management plan, contingency planning is governed primarily by the Emergency Response Management Plan (AGA-R&R-PL01) and the Crisis Management Plan (AA-GRC-PL06). The Emergency Response Management Plan documents AGA's incident and emergency response processes. The Crisis Management Plan details the role and responsibilities of ATCO Australia Crisis Management Team (CMT). As stated by the plan, the function of the CMT is to strategically manage a crisis affecting AGA. While the CMT may monitor the emergency response, it is not involved with specific operational details of how the emergency is handled which the responsibility of the business units. Overall responsibility for the CMT response resides with the Managing Director. Once activated, the CMT receives input from every source involved in the crisis. It monitors the operational emergency or event, the community reaction, the political response and the media impact. The CMT assesses the impact of the crisis on ATCO Australia's people, statutory and legal obligations, its reputation and its business. The Team makes decisions to address those impacts, not the crisis itself.

Most incidents are reported are from the public. First response is initiated by the Customer Service Call Centre. Emergencies are evaluated within the requirements of the Emergency Management Plan and related standards. During interview with Call Centre staff, the review team cited their standard response guidelines. Response within the maintenance area typically involves performing isolations and repair. However, when an incident is classified as an emergency, the Incident Management Team (IMT) and Emergency Management Team (EMT) are activated. The IMT is made up of relevant area Managers and Supervisors, the EMT is made up of Network Operations.

The Incident Investigation and Notifiable Incident Report procedure (AGA-R&R-PR03) was cited during the interviews (AGA-R&R-PR03). Incidents may first be classified as notifiable, then escalated to the level of reportable, if required. Examples of broken gas mains were cited. Of approximately 60 to 70 broken mains occurring per year, around 10 to 15 are considered notifiable. Reportable incidents are estimated to be around one-third of notifiable incidents.

Information regarding AGA's third party awareness program was cited which is designed to reduce the number of notifiable incidents. A spreadsheet of incident reporting starting in 2008 was presented during the interview demonstrating consistent capturing and reporting of incidents from that date up to and including the close of the reporting period.

Incidents are assessed and classified as one of four types: Minor, Major, Emergency, Crisis. Each type represents a level of escalation in which additional procedural requirements apply. When a Crisis is declared the CMT is activated. The process from the Emergency Response Plan was reviewed and appeared adequate. There were no crisis level incidents reported during the reporting period. Engagement of the EMT is driven by incident severity or local resource constraints. Low and medium severity incidents are handled locally if they have the capacity at the time of the incident.

An incident which activated the EMT was reviewed including learnings from the incident, Loss of Gas Supply HRN48 Regulating Facility Incident Report (TRC-RP-0327). The incident involved an unplanned gas supply interruption in North Fremantle in which 705 customers lost gas supply. The sequence of events was included in the report. Asset Failure (valve-shut-off) was identified as the cause. Shut down of gas supply in the area was required including purging of the system. Upon recovery, individual reinstatement of each property had to occur in a safe manner over the course of three days. A recommendation in the report included increasing asset redundancy and eliminating single-point failure locations to improve availability / system reliability. The incident serves as an example of learning from incidents and continuous improvement as the study identified other areas in Perth with the same issue. Corrective measurements were applied in identified areas where similar installations were present. Full documentation was included in the report including permits to work, isolations, Job Risk Assessment (JRA), diagrams and maps of the area.

The 2019 Jarrah Rd, Bentley, Mains Break Incident Report (TCO-RP-0397) was reviewed as an example of a significant incident involving third party damage. The incident involved a broken gas main due to works on a water main in which 8 people were affected. The report presented was comprehensive and included internal supporting documentation.

Individuals from the call centre, control room and field operations team were interviewed and asked to demonstrate their roles in an escalating emergency. Each demonstrated the procedures, system (via software screens) and processes they follow in the event of an emergency.

Emergency response exercises are frequently completed in Perth CBD (1 Zone per year), Metro (every 2 years), Regional (1 region every year), Albany LPG (once every 3 years). The complete list was cited in Table 3 of the Emergency Response Plan.

Emergency response exercise examples were cited including exercises from 2018.

An Isolation Plan was cited which is applied to individual properties, mains, and feeds. It was noted that the Fremantle Area does not have an Isolation Plan as the area only has around 2000 customers with squeeze-off locations available throughout and locatable via the GIS system. The procedure Application of Flow Stopping: Operating Rogan Procedure (SWI FS 001) was presented during an interview.

The following documentation was also checked for adequacy during the interviews:

- AGA-R&R-PL01-FM14 Emergency Response Action Checklists
- AGA-R&R-PL01-FM16 Emergency Planning and Response Checklist
- AGA-R&R-PL01-WI03 After Hours Call Out Roster (Procedure).
- Latest After Hours Call Out Roster
- AGA-R&R-PR03 Notifiable Incident Reporting.

Scenario information was presented from the Emergency Response Management Plan (AGA-R&R-PL01), Section 8.1, listing incidents and scenarios considered most likely to occur.

During the interviews, viewing of the trending data and incident database was requested. AGA advised that there is no centralised database. Alerts and updates are collated and issued to staff via email.

5.9.3 Process recommendations

The key recommendations are provided in Table 22.

Table 22 - Recommendations for contingency planning

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
9	**Contingency planning** Contingency plans document the steps to deal with the unexpected failure of an asset.			A	2
9.1	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	2	Observation: During the interview, viewing of the trending data and incident database was requested. AGA advised that there is no centralised database. Alerts and updates are collated and issued to staff via email. AGA should consider implementation of a centralised incident database to enable trending of incident data.	A	2

5.10 Financial Planning (Asset Management Element #10)

5.10.1 Licensee's Performance Summary

The intended purpose and outcome of the financial planning element are:

- Purpose - "Financial brings together the financial elements of the service delivery to ensure its financial viability over the long term."
- Outcome - "The financial plan is reliable and provides for the long-term financial viability of the services."

The performance summary for financial planning is set out in Table 23.

Table 23 - Financial planning summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
10. Financial planning	A	1
10.1 The financial plan states the financial objectives and identifies strategies and actions to achieve those	A	1
10.2 The financial plan identifies the source of funds for capital expenditure and recurrent costs	A	1
10.3 The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	A	1
10.4 The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period	A	1
10.5 The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	A	1
10.6 Large variances in actual/budget income and expenses are identified and corrective action taken where necessary	A	1

5.10.2 Observations

General

AGA secures budget approved from ATCO Corporate through the financial plan, which is approved by the Board in Canada. An extract from the board meeting was provided by the Company Secretary demonstrating submission and approval was received 21st March 2019.

The financial plan derives financial information from the asset-specific asset management plans. The asset management plans, and associated lifecycle strategies capture the asset strategy and objectives with costings. The link between the asset management plans and the financial plan is driven by the asset lifecycle strategies which underpins the projects strategies. The Asset Management Plan-Coastal (AGA-S&P-PL02) was presented showing an example of forecast expenditure over the course of a 10 years investment plan.

The financial plan captures OPEX, CAPEX and revenue for the AGA assets in a five-yearly rolling budget. The plan for the year is prepared in advance, starting the process in around May from the previous year. The plan is owned by the Investment Governance Committee and passes through multiple review stages before being submitted to the AGA Board for approval. It is then presented to the ATCO Board.

The AGA Business Plan 2019 to 2021 was reviewed and confirmed to adequately capture the required elements (OPEX Forecast, OPEX Actual vs Planned, CAPEX Forecast, CAPEX Actual vs Planned, Employee Labour spend and estimates, Cash, Debt, funding etc). Included was the financial report from the previous year showing baseline assumptions verses actual cost.

Examples of internal reporting was cited for Capex (Projects Report) and OPEX spending (Actual vs forecast tracking). The capex tracking tool was cited as well as an Investment Governance Committee report demonstrating tracking and reporting of labour captured within both OPEX and CAPEX.

The Mains Replacement Prioritisation Tool provides an estimation of linear asset replacement costs and feeds into the financial plan. An example was reviewed (Pipelines Mains AGA-S&P-ST08) showing the connectivity of the Mains Replacement Tool, the asset lifecycle strategy, and the budget.

The reviewer requested an example of evidence of flexibility in the process, responding to new opportunities and change. Examples of changes and substitutions were shown from Investment Governance Committee reports.

Element 10.1 The AGA Business Plan 2019-2021 was cited; it contains the financial plan which states the financial objectives and identifies strategies and actions to achieve those objectives.

Element 10.2 The financial plan identifies the source of funds for capital expenditure and recurrent costs. Source and approval for funding was cited in the Board approval.

Element 10.3 The financial plan was confirmed to provide projections of operating statements (profit and loss) and statement of financial position (balance sheets).

Element 10.4 The AGA financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period. The Demand Forecast input into the financial plan was presented which is supplied by CORE, an independent third-party consultant that evaluates the market environment and forecasts developments and associated demand.

Element 10.5 The AGA financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services. The plan reflects the requirements of the associated asset management plans and asset lifecycle strategies. The CAPEX Works Program Forecast was also presented during the interview showing a forecast of 5 years covering the Access Arrangement requirements.

Element 10.6 Large variances in actual/budget income and expenses are identified and corrective action taken where necessary. The Project Management Manual, discussed in Section 5.2, provides the project governance rules to ensure variances in budget are identified and appropriately managed. The Pigging Infrastructure Facility Upgrade project was cited as an example of management of variation in cost. The Business Case and a Capital Expenditure Appropriation Request for the project was reviewed demonstrating identification of forecast overrun with corrective actions including identification of additional funding.

5.10.3 Process recommendations

The key recommendations are provided in Table 24.

Table 24 - Recommendations for financial planning

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
10	**Financial planning** Financial brings together the financial elements of the service delivery to ensure its financial viability over the long term.			A	1
10.1	The financial plan states the financial objectives and identifies strategies and actions to achieve those	5	Requirement fulfilled.	A	1
10.2	The financial plan identifies the source of funds for capital expenditure and recurrent costs	5	Requirement fulfilled.	A	1
10.3	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	5	Requirement fulfilled.	A	1
10.4	The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period	5	Requirement fulfilled.	A	1
10.5	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	5	Requirement fulfilled.	A	1
10.6	Large variances in actual/budget income and expenses are identified and corrective action taken where necessary	5	Requirement fulfilled.	A	1

5.11 Capital Expenditure Planning (Asset Management Element #11)

5.11.1 Licensee's Performance Summary

The intended purpose and outcome of the capital expenditure planning element are:

- Purpose - "The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure for these works over the next five or more years. Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates."
- Outcome - "The capital expenditure plan provides reliable forward estimates of capital expenditure and asset disposal income. Reasons for the decisions and for the evaluation of alternatives and options are documented."

The performance summary for asset disposal is set out in Table 25.

Table 25 - Capital expenditure planning performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
11. Capital expenditure planning	A	1
11.1 There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates	A	1
11.2 The capital expenditure plan provides reasons for capital expenditure and timing of expenditure	A	1
11.3 The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	A	1
11.4 There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented	A	1

5.11.2 Observations

General

The CAPEX Business Plan, AGA's capital expenditure plan, was reviewed. It covers works to be undertaken, reasons, and timing. It was found to be consistent with the asset management plans and associated lifecycle strategies. The associated processes were reviewed to confirm the capital expenditure plan is regularly updated and implemented.

Element 11.1 The capital expenditure plan was reviewed and confirmed to cover works to be undertaken, actions proposed, responsibilities and dates.

Element 11.2 The capital expenditure plan cited provides reasons for capital expenditure and timing of expenditure.

Element 11.3 The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan. As discussed in Section 5.10, the Mains Replacement Prioritisation Tool provides an estimation of linear asset replacement costs and feeds into the capital expenditure plan. An example was reviewed (Pipelines Mains AGA-S&P-ST08) showing the connectivity of the Mains Replacement Tool, the asset lifecycle strategy, and the budget.

Element 11.4 There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented. Documentation from two projects was reviewed as examples of project estimating and tracking: The 2019 Pigging Project and the Leak Survey Project. The following documents were reviewed in relation to the projects:

- Business Case which included the budget breakdown.

- Project tracking reports
- Investment Governance Committee reports demonstrating advance notice to management of potential project or operational cost over-runs.
- Capital Project Change Request form demonstrating approval for additional spending prior to overrunning the spend limit. (If a project is forecast to exceed 10% overrun then financial approval is required, through a Capital Expenditure Approvals Request.)

The Pigging Project notification of forecast higher than 110% was provided in May 2019 (early project phase). Investment Governance Committee Reports between May and October consistently report forecasted overrun providing early notification to management of overspend risk/forecast. The associated approval request was signed-off in November 2019 prior to reaching the allowed spending limit.

The CAPEX tracking tool was also cited as well as SAP screenshots which captures the spend against each project. A Consolidated Capital Projects report was tabled demonstrating substitutions between projects in order to maintain overall budget. Forecasting is performed on a month to month basis and reported to the Investment Governance Committee. Related committee reports were cited.

Two spreadsheet tools were cited which support capital management: 1219 ATCO Capital Construction Snapshot (2019/2018) and the CAPEX Works Program Forecast Template, and the CAPEX Business Plan template submission capturing forecast demand estimates.

5.11.3 Process recommendations

The key recommendations are provided in Table 26.

Table 26 - Recommendations for capital expenditure planning

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
11	**Capital expenditure planning** The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure for these works over the next five or more years.			A	1
11.1	There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates	5	Requirement fulfilled.	A	1
11.2	The capital expenditure plan provides reasons for capital expenditure and timing of expenditure	5	Requirement fulfilled.	A	1
11.3	The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	5	Requirement fulfilled.	A	1
11.4	There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented	5	Requirement fulfilled.	A	1

5.12 Review of AMS (Asset Management Element #12)

5.12.1 Licensee's Performance Summary

The intended purpose and outcome of the review of AMS element is: "The asset management system is regularly reviewed and updated."

The performance summary for review of AMS element is set out in Table 27.

Table 27 - Review of AMS performance summary

Asset management process & effectiveness criteria	Process and policy rating	Performance rating
12. Review of AMS	A	1
12.1 A review process is in place to ensure the asset management plan and the asset management system described in it remain current	A	1
12.2 Independent reviews (e.g. internal audit) are performed of the asset management system	A	1

5.12.2 Observations

General

The update of documents and information management is discussed in Section 5.1 and 5.7. All key documents, such as asset plans and strategies, are reviewed regularly and kept up to date with supporting processes in place.

AGA have comprehensive audit schedule, which was cited, as well as examples of audits and action tracking. The following were reviewed to confirm effectiveness of the review process and confirm ongoing independent reviews are performed:

- April 2019, Internal Audit Report
- AGA 2019 Audit Plan
- AGA's Integrated Management System Manual
- AGA's Document Control System register.

The focus of this element is the review and audit processes, which are in place, and are performing effectively. Opportunities for improvement at the more detailed/tactical execution level which are captured elsewhere (refer Section 5.1.3 and 5.7.3).

Element 12.1 A review process is in place to ensure the asset management plan and the asset management system described in it remain current. All key documents were updated early 2020 except for the Asset Management Policy which was updated early 2018. The previous AMS review also reported that AGA met the requirement for regular review and update of the asset management plan.

Element 12.2 Independent reviews and internal audits are performed for the asset management system. The audit plan demonstrates frequent reviews and audits are conducted across all asset management process elements. Each year different elements are selected for focus. The actions identified are captured into the Technical Compliance Register where they are tracked.

5.12.3 Process recommendations

The key recommendations are provided in Table 28.

Table 28 - Recommendations for review of AMS

Reference no.	Asset management process or effectiveness criteria	Review priority	Observations & Recommendations	Process and policy rating	Performance rating
12	**Review of AMS** The asset management system is regularly reviewed and updated.			A	1
12.1	A review process is in place to ensure the asset management plan and the asset management system described in it remain current	4	Requirement fulfilled.	A	1
12.2	Independent reviews (e.g. internal audit) are performed of the asset management system	4	Requirement fulfilled.	A	1

6 Recommendations

This section details recommendations for process elements found to require implementation of corrective actions and is written in conformance with the 2019 Audit and Review Guidelines (Electricity and Gas Licenses), Clause 5.1.8 for reviews.

Detailed discussion of observations and recommendations is provided in Section 5 for each respective asset management process and effectiveness criterion.

Corrective actions are mandatory for deficiencies identified for which the asset management processes, or effectiveness criteria were:

- rated 3 or 4 performance rating or
- rated C or D process and policy rating.

Recommendations for processes elements requiring corrective action are detailed in Table 29.

Table 29 – Recommendations to address current system deficiencies.

Unresolved during current review Period			
Recommendation reference (no./year)	**Process and policy deficiency / Performance deficiency** (Rating / Reference number, Asset management process & effectiveness criterion / Details of deficiency)	**Reviewer's recommendation**	**Action taken by the licensee by end of review period**
01/2020	**B3** **(8.1) Risk Management –** Risk management policies and procedures exist and are applied to minimise internal and external risks	Ensure sign-off of all risk related assessments is mandatory and implemented.	The recommendation has not been addressed.
02/2020	**B3** **(8.2) Risk Management –** Risks are documented in a risk register and treatment plans are implemented and monitored	It is recommended that overdue actions listed in the Technical Compliance Register (TCO R0003) be resolved or re-assessed with revised due dates assigned.	The recommendation has not been addressed.

7 Report Approval Statement

The following declaration of independence and report approval statement are written in conformance with the 2019 Audit and Review Guidelines (Electricity and Gas Licenses), Clauses 2.2.1 and 5.1.9 for reviews.

7.1 Declaration of Independence

As required by the Guidelines, the lead reviewer and each audit team member remained compliant with the independence criteria set out in the guidelines, throughout the review.

7.2 Report Approval Statement

This review report is confirmed approved by the Lead Reviewer. This review report is an accurate presentation of the findings and opinions of the lead reviewer.

7.3 Signed Statement of Conformance

This report has been undertaken independently and is approved in conformance with the requirements of the 2019 Audit and Review Guidelines (Electricity and Gas Licenses), the approved review plan, and the above declaration of independence and report approval statements.

Signed: Date:

_____ _____

Shane Becker (Lead Reviewer)
Asset Management and Engineering Consultant
Chartered Professional Engineer (CPEng)
Certified Practitioner in Asset Management (CPAM)
Certified Asset Management Assessor (CAMA)
LogiCamms Ltd.

Appendix A – Report Compliance

Section 5 of the 2019 Audit and Review Guidelines (Electricity and Gas Licenses) prescribes the required contents for an Asset Management System Review. The table below maps the requirements detailed in the 2019 Guideline to this report.

Table 30 - Guidelines Compliance Mapping

Requirement from 2019 Audit and Review Guidelines (Electricity and Gas Licenses)	Guideline Section	Guideline Page	Report Section(s)	Report Page
Minimum Contents	5.1	26	Contents	3
Executive Summary	5.1.1.2	27	1	6
Review Objectives	5.1.2	27	2	9
Review Scope of Work	5.1.3	27	3	10
Deviations from the Review Plan	5.1.4	28	3.4	10
Recommendations from the Previous Review	5.1.5	28	4	15
For each process element:				
- Table Summarising Licensee's Performance	5.1.6.2 Table 11	33	5 (5.x.1)	16ff
- Reviewer's observations	5.1.7	35	5 (5.x.2)	16ff
- Table of observations and recommendations	5.1.7 Table 13	38	5 (5.x.3)	16ff
Recommendations	5.1.8	38	6	54
Declaration of Independence and Report Approval	2.2.1 5.1.9	12 41	7	55

Appendix B – Table of Documents Reviewed

Table 31 - Documents Cited or Reviewed

Document Title (as per file name)	Type	Document Number	Revision	Date
General				
2020 AMS Audit Schedule	pdf	NA	NA	NA
AA-GRC-PR02-RG01 Controlled Document Register_AMS extract	pdf	AA-GRC-PR02-RG01	1	20/03/2019
AMS Review - Organisational Structure	pdf	NA	NA	NA
Approval of review plan - 2020 review - ATCO Gas Australia Pty Ltd - GDL008	pdf	D212293	NA	26/02/2020
Audit and Review Guidelines Electricity and Gas Licences (clean version) - published on ERA website	pdf	D198385	2	March/2019.
ERA GAS 006 Coastal, Great Southern and Goldfields Esperance ATCO Gas	pdf	None	None	None
Gas Distribution Licence 8 - Version 11 - 1 January 2017 - GDL008 - ATCO Gas Australia Pty Ltd	pdf	NA	11	11/01/2017
01. Asset Planning				
01. AMSR 2020 Presentation - Asset Planning	pdf	NA	NA	NA
AGA-S&P-DS01 ATCO Operational Key Performance Indicators 2019	pdf	AGA-S&P-DS01	6	25/07/2019
AGA-S&P-PL01_Strategic_Asset_Management_Plan	pdf	AGA-S&P-PL01	0	12/02/2020
AGA-S&P-PL02_Asset_Management_Plan_-_Coastal	pdf	AGA-S&P-PL02	5	13/02/2020
AGA-S&P-PL03 Asset Management Plan - Albany	pdf	AGA-S&P-PL03	5	13/02/2020
AGA-S&P-PL04 Asset Management Plan - Kalgoorlie	pdf	AGA-S&P-PL04	0	13/02/2020
AGA-S&P-PR01 Distribution System Performance Review	pdf	AGA-S&P-PR01	2	20/01/2020
AGA-S&P-SD03 Network Planning Design Standard	pdf	AGA-S&P-SD03	7	18/11/2019
AGA-S&P-ST06_Asset_Lifecycle_Strategy_-_Corrosion_Protection_Systems	pdf	AGA-S&P-ST06	8	11/02/2020
AGA-S&P-ST07_Asset_Lifecycle_Strategy_-_Metering_Facilities	pdf	AGA-S&P-ST07	10	11/02/2020
AGA-S&P-ST08_Asset_Lifestyle_Strategy_-_Pipelines_Mains_and_Services	pdf	AGA-S&P-ST08	8	11/02/2020
AGA-S&P-ST09_Asset_Lifecycle_Strategy_-_Pressure_Regulating_Facilities	pdf	AGA-S&P-ST09	8	11/02/2020
AGA-S&P-ST10_Asset_Lifecycle_Strategy_-_Supervisory_Control_&_Data_Acquisition_(SCADA)	pdf	AGA-S&P-ST10	7	11/02/2020
AST PL00017 MP Development Plan 2016	pdf	AST PL00017	1	8/02/2017
AST PO00001 Asset Management	pdf	AST PO00001	6	23/01/2018
AST ST 00006 Network Monitoring Strategy	pdf	AST ST 00006	2	28/12/2016
AST ST00002 Network Maintenance Strategy	pdf	AST ST00002	3	15/01/2017
AST ST00003 Network Planning Strategy	pdf	AST ST00003	3	15/01/2017
AST ST00004 Network Operating Strategy	pdf	AST ST00004	4	15/01/2017
AST ST00007 Winter Severity Factor Review	pdf	AST ST00007	0	27/09/2016
ATCO Customer Service Benchmarking Australia_Annual Results 2019	pptx	NA	NA	NA
Memorandum - Asset Lifecycle Strategies (Network)	pdf	NA	NA	22/01/2020
Memorandum - Asset Lifecycle Strategies (Non-Network)	pdf	NA	NA	22/01/2020
Memorandum - Strategic & Coastal AMP	pdf	NA	NA	22/01/2020
PMDData_2020-01-31_11-25-48-AM	xlsx	NA	NA	NA
TCO PL00005 AGA Gas Distribution System Safety Case	pdf	TCO PL00005	6	1/12/2017
ATCO Customer Service Benchmarking Australia_Annual Results 2019	pptx	NA	NA	NA
PMDData_2020-01-31_11-25-48-AM	xlsx	NA	NA	NA

02. Asset Creation and Acquisition				
02. AMSR 2020 Presentation - Asset Creation & Acquistion	doc	NA	NA	NA
AGA-ENG-PR28-RG01 Project Risk Register	pdf	AGA-ENG-PR28-RG01	0	19/02/2018
ENS GL 0012 Engineering Services Design Guideline Highrise	pdf	ENS GL 0012	0	22/08/2016
ENS PR0002 Meter Set Design and Selection	pdf	ENS PR0002	8	18/03/2015
ENS PR0011 Asset Handover	pdf	ENS PR0011	2	20/10/2011
ENS PR0015 Engineering Services Design Guideline Regulator Sets	pdf	ENS PR0015	8	8/11/2016
ENS PR0018 Engineering Services Design Guideline Valves	pdf	ENS PR0018	4	27/05/2014
ENS PR0019 Engineering Services Design Guideline Pipelines	pdf	ENS PR0019	9	4/08/2017
ENS PR0031 Flow Computing and Telemetry Equipment Design and Selection	pdf	ENS PR0031	4	27/10/2011
ENS PR0038 Project Risk Management Procedure	pdf	ENS PR0038	0	19/02/2018
PMM MA00001 Project Management Manual	pdf	PMM MA00001	5	29/06/2018
PMM PO00001 Project Management Policy	pdf	PMM PO00001	0	14/212/16
1520-GCA1-NM-0043 Facility Upgrade - Pigging Infrastructure Approved BC & CEAR	pdf	1520-GCA1-NM-0043	NA	10/01/2019
3024-MDR-QA-001_1_A_IFA (MDR INDEX)	pdf	**Several series of documents (473 pages)**		
AGA-R&R-PR10-RG01 Delegation of Engineering Technical Authority	pdf	AGA-R&R-PR10-RG01	4	21/01/2019
Como - Option1 - NPV Main replacement	xlsm	NA	NA	NA
Como - Option2 - NPV HPR and Main extension	xlsm	NA	NA	NA
Como Reinforcement B.C.	docx	AGA-FIN-PR03	4	16/07/2019
HP106 Pigging Close out Report	docx	NA	0	16/01/2020
Lesson Learnt-Pigging Project 16-1-20	pdf	NA	0	16/01/2020
Major Work Permit - Bernley Dr Viveash PRS009 - (6285159)	pdf	TCO PR0007 WI004 RF02	9	1/03/2018
Major Works Permit - PS009 Reinstatement - Works Program - (6285159)	pdf	TCO PR0007 WI004 RF04	0	20/04/2016
PDR-2019-PL106 ILI Project_0	pdf	PDR-2019-PL106	0	16/07/2019
PL106 Pigging Major Work Permit -(6285159)	pdf	TCO PR0007 WI004 RF02	9	1/03/2018
Project Cost Estimate Template 2019 - COMO Reinforcement - Option 2	xlsb	NA	NA	NA
03. Asset Disposal				
AGA-ENG-GL12 Management of Decommissioned Assets	pdf	AGA-ENG-GL12	1/01/1900	26/08/2019
04. Environmental Analysis				
00 Agenda RMCC 15 October 2019	pdf	NA	NA	NA
03.1 Compliance Report_Redacted	pdf	NA	NA	NA
04. AMSR 2020 Presentation - Environmental Anaylsis	pptx	NA	NA	NA
Copy of Technical Compliance Document Register (TCO RG0003)	xlsm	NA	NA	0/01/1900
Manager Asset Services - Kelvin Grace	pdf	NA	NA	16/04/2019
Master Obligation Register	xlsx	NA	NA	NA
Oct 2019 Reg Change paper	pdf	NA	NA	NA
SWI_MRA_019_Apply_Remove_TAC_Lock	pdf	SWI MRA 019	1	30/11/2018
00 Agenda RMCC 15 October 2019	pdf	NA	NA	NA
03.1 Compliance Report_Redacted	pdf	NA	NA	NA
Copy of Technical Compliance Document Register (TCO RG0003)	xlsm	NA	NA	0/01/1900
Manager Asset Services - Kelvin Grace	pdf	NA	NA	16/04/2019
Master Obligation Register	xlsx	NA	NA	NA
Oct 2019 Reg Change paper	pdf	NA	NA	NA
ATCO Gas Compendium amendments	pdf	NA	NA	13/09/2019

Draft-decision---Proposed-amendments-to-the-compendium-of-gas-customer-licence-obligations---2019-review	pdf	D205412	NA	NA
Notice---Consultation-on-draft-decision---Proposed-amendments-to-the-Compendium-of-Gas-Customer-Licence-Obligations	pdf	NA	NA	28/08/2019
RE Submission RE Proposed amendments to the Gas Compendium	Outlook	NA	NA	NA
Copy of Gas Distribution Licence Performance Reporting Datasheets 2019	xlsx	NA	NA	NA
FINAL FOR PUBLICATION - Annual Performance Report - Energy Distributors 201718	pdf	D200638	NA	April/2019.
2018 Annual IMS Management Review_Final_	docx	NA	NA	26/03/2019
2018 Annual Management Review Presentation	pptx	NA	NA	NA
AGA-S&P-DS01 ATCO Operational Key Performance Indicators 2019	pdf	AGA-S&P-DS01	9	25/07/2019
05. and 06. Asset Operations and Management				
01.AGA-GRC-RG02 Field Operations Manual Index	pdf	AGA-GRC-RG02	120	31/01/2020
02.AGA-GRC-RG03 Customer Service Manual Index	pdf	AGA-GRC-RG03	87	3/02/2020
03.AGA-GRC-RG04 Mains and Service Laying Manual Index	pdf	AGA-GRC-RG04	86	3/02/2020
05. AMSR 2020 Presentation - Asset Operations	pptx	NA	NA	NA
06. AMSR 2020 Presentation - Asset Maintenance	pptx	NA	NA	NA
23 Feb 2020 Weekly Patrol Sheet	docx	AGA-SWI ST 001 RF02	15	12/10/2018
2018 CP Annual Rpt final	docx	2018 – CP RPT	0	30/05/2019
AGA-GRC-PR06 SWI Review and Sign Off Process	pdf	AGA-GRC-PR06 SWI	4	2/09/2019
AGA-O&M-WI04 Broken Mains and Services Instructions for Control Room Officers	pdf	AGA-O&M-WI04	7	22/11/2019
AGA-O&M-WI04-FM01 Customer Service Standards Faults Scripting	pdf	AGA-O&M-WI04-FM01	9	4/10/2019
AGA-O&M-WI04-FM02 SAP Priority Information	pdf	AGA-O&M-WI04-FM02	9	18/12/2019
NCO PR0013 Network Pressure Management of Change	pdf	NCO PR0013	1	19/10/2017
NPCF 047 2020	pdf	AGA-O&M-PR15-FM01	3	29/05/2019
TCO PR0002 Management of Change	pdf	TCO PR0002	6	23/05/2017
TCO PR0007 Permit to Work System	pdf	TCO PR0007	12	24/11/2016
TRN MA00003 Site Safety and Environment - Prerequisite Course	pdf	TRN MA00003	2	30/06/2016
TRN PR0001 Training Management Process	pdf	TRN PR0001	7	6/02/2017
18.02.2020	xlsx	NA	NA	NA
23 Feb 2020 Weekly Patrol Sheet	docx	AGA-SWI ST 001 RF02	15	12/10/2018
1520-GCA1-GN-0100 Facility Upgrade - Pigging Facilities HP091 Project Brief	docx	1520-GCA1-GN-0100	1	30/10/2019
1521-2017-GCA1-NM-039 AS2885 Pigging Infrastructure - PL28 Harrow St APPROVED BC AND CEAR	pdf	1521-2017-GCA1-NM-039	NA	NA
2018 CP Annual Rpt final	docx	2018 – CP RPT	0	30/05/2019
302337928 (Wembley - 302303170)	pdf	INS RF03	0	27/03/2018
AA-GRC-PR02-RG01 CDR Showing AGA-SWI-MRA21 Review	pdf	AA-GRC-PR02-RG01	1	20/03/2019
AGA Leak Survey Contractors Matrix_16.03.2020	xlsx	NA	NA	NA
AGA-OM-GL08 Leak Survey Activity and Planning Guideline 2020	pdf	AGA-O&M-GL08	1	18/12/2019
AGA-SWI-MRA21 Meter Installations (Less than 10m3h) (Part 1)	pdf	AGA-SWI-MRA21	2	2/12/2019
Class 2 Leak notification following Leak Survey	docx	NA	NA	NA
Leak Survey Report Sheet 2019 - North Metro Screenshot	pdf	NA	NA	NA
Maintenance frequency change from four to six months	pdf	No info, document refers to ARMS ----- HPR013 RCMRCMCost Study Rev 3 11/04/18		
Pressure Reduction Station maintenance samples (from SAP)	docx	NA	NA	NA
RMC 2020	xlsx	NA	NA	NA
RMC process	docx	NA	NA	NA

Scope of Works Road Resurface 081118	docx	NA	NA	NA
TCO PR0007 WI003 RF01 Hot Work Permit Road Resurface 051118	docx	TCO PR0007 WI003 RF01	3	27/07/2016
TCO PR0007 WI004 RF02 Major Work Permit Road Resurface 081118	docx	TCO PR0007 WI003 RF02	9	1/03/2018
TCO RP 0331 Regulator Setting Tube Rev 0	pdf	TCO RP 0331	0	3/09/2018
TCO RP 0342 Albany LPG Facility Driveway Resurfacing HAZID	xlsx	TCO RP 0342	NA	NA
HP Patrol 18.11.19	docx	NA	NA	NA
HP Patrol 25.11.19	docx	NA	NA	NA
SPM Notification Photo from the OC Field Mobility device	pdf	NA	NA	22/11/2019
PRS012 Security Fence Hole	outlook	NA	NA	NA
07. Asset Management Information Systems				
05. AMSR 2020 Presentation - Asset MIS	pptx	NA	NA	NA
2019 2020 IT related audits	docx	NA	NA	2/10/2019
2019 Disaster recovery audit scope and recommendations	docx	NA	NA	NA
AA-GOV-FWK-01 Information Management Governance Framework	pdf	AA-GOV-FWK-01	0	20/05/2016
AA-GRC-PR02_Document_Control_Procedure	pdf	AA-GRC-PR02	15	4/09/2019
AGA-GRC-PR09 Preparation and Submission of Annual Performance Report	pdf	AGA-GRC-PR09	3	19/09/2019
AST ST00015 Information Technology Asset Strategy	pdf	AST ST00015	1	31/08/2018
Copy of Gas Distribution Licence Performance Reporting Datasheets 2019	xlsx	NA	NA	NA
Project Closure Report - DR Test 2019_Draft	docx	NA	NA	NA
RMT_PL00005_ATCO_Gas_Australia_Business_Continuity_Plan	pdf	RMT PL00005	8	28/06/2017
2019 2020 IT related audits	docx	NA	NA	2/10/2019
Copy of Gas Distribution Licence Performance Reporting Datasheets 2019	xlsx	NA	NA	NA
08. Risk Management				
AA-GRC-PL05 Risk Management Framework	pdf	AA-GRC-PL05	3	3/04/2019
AA-GRC-PO04 Risk Management Policy	pdf	AA-GRC-PO04	0	13/12/2018
AGA-GRC-RG08 ATCO Gas Australia Risk Matrix	pdf	AGA-GRC-RG08	1	27/06/2019
ATCO Gas Corporate Risk Register	pdf	NA	NA	21/02/2020
NCO PR0013 Network Pressure Management of Change	pdf	NCO PR0013	1	19/10/2017
Permit to work project TCO-RP-0342	pdf	TCO PR0007 WI004-RF02	9	1/03/2018
TCO GL0001 Technical Compliance Risk Management Guideline	pdf	TCO GL0001	5	26/03/2018
TCO PR0002 Management of Change	pdf	TCO PR0002	6	23/05/2017
TCO PR0008 GDS Risk Register (Action Tracking)	pdf	TCO PR0008	1	18/12/2015
AGA-R&R-PR06-WI01-FM01 Confined Space Entry Permit	docx	AGA-R&R-PR06-WI01-FM01	7	17/12/2019
AGA-R&R-PR06-WI02-FM01 Deep Excavation Permit	docx	AGA-R&R-PR06-WI02-FM01	7	17/01/2020
AGA-R&R-PR06-WI03-FM01 Hot Work Permit	docx	AGA-R&R-PR06-WI03-FM01	4	17/01/2020
TCO PR0007 Permit to Work System	pdf	TCO PR0007	12	24/11/2016
TCO PR0007 WI001 Confined Space Entry	pdf	TCO PR0007 WI001	8	11/05/2018
TCO PR0007 WI002 Deep Excavation	pdf	TCO PR0007 WI002	3	27/07/2016
TCO PR0007 WI003 Control of Hot Work	pdf	TCO PR0007 WI003	5	11/05/2018
TCO PR0007 WI004 Network Control Permit	pdf	TCO PR0007 WI004	4	24/11/2016
ATCO Gas Corporate Risk Register	pdf	NA	NA	21/02/2020
November Safety Focus 2019_safety intervention slide 14 notes_ (PDF only)	pdf	NA	NA	NA
TCO RP 0246 Leak Survey FSA Revision 0 2017-11-02	docx	TCO RP 0246	0	2/11/2017

TCO_RP_0245_AS2885_SMS_Reviews_AGA_Class_300__600_Pipelines_0	pdf	TCO RP 0245	0	7/07/2017
TCO RP 0246 Leak Survey FSA Revision 0	pdf	TCO RP 0246	0	2/11/2017
TCO RP 0342 Albany LPG Facility Driveway Resurfacing HAZID	xlsx	NA	NA	NA
TCO RP 0400 HPR HAZOP P4-900-1286 Rev K (check valve)_Rev0	pdf	TCO RP 0400	0	19/11/2019
TCO_RP_0246_Leak Survey FSA Revision 0.2 2019-11-05	xlsx	TCO RP 0246	NA	NA
CONFINED SPACE ENTRY	pdf	TC0 PR0007 WI001 RF01	6	14/05/2018
DEEP EXCAVATION	pdf	TC0 PR0007 WI002 RF01	6	14/05/2018
HOT WORKS	pdf	TC0 PR0007 WI003 RF01	3	27/07/2016
MAJOR PERMIT	pdf	AGA-R&R-PR06-WI04-FM02	10	17/01/2020
MINOR WORKS PERMIT	pdf	AGA-R&R-PR06-WI04-FM01	9	17/12/2019
09. Contingency Planning				
AA-GRC-PL06 Crisis Management Plan_2020	docx	AA-GRC-PL06	8	9/03/2020
AGA-R&R-PL01 Emergency Response Management Plan	pdf	AGA-R&R-PL01	7	9/12/2019
10. and 11. Financial and CAPEX Planning				
COM PO00002 ATCO Gas Australia Capital Contributions Policy	pdf	COM PO00002	6	2/08/2018
COM PR0007 Capital Contributions Procedure	pdf	COM PR0007	2	30/08/2016
12 Review of AMS				
AGA-GRC-MA01 Integrated Management System Manual	pdf	AGA-GRC-MA01	14	26/02/2019
ATCO_Australia_2019AuditPlanHours	pdf	NA	NA	24/10/2018
Audit Report 2018 AGA Measurement Integrity V2	docx	NA	NA	April/2019.
Australia 2020AP MASTER V8 (Oct 2 2019)	pdf	NA	NA	2/10/2019
Doc Control Register Screenshots	docx	AA-GRC-PR02-RG01	NA	NA
AMP Digital Form.png	png	NA	NA	NA
AMP Page.png	png	NA	NA	NA
complaint1.png	png	NA	NA	NA
complaint2.png	png	NA	NA	NA
complaint3.png	png	NA	NA	NA
DBYD _ Asset Location Feedback - WA - DBYD.html	html	NA	NA	NA
NCO MA00001 Pipeline Damage Prevention Manual	pdf	NCO MA00001	0	9/09/2014
UPSC-WA-Code-of-Practice-Rev-2-March-2019	pdf	NA	NA	NA
Winter Safety 2019 - Post Campaign Report	pdf	NA	NA	NA
Winter Safety Communications	docx	NA	NA	NA

Appendix C – Glossary of Terms

The terms commonly used in this report and reference documents are captured in Table 32.

Table 32 – Glossary of Terms

Abbreviation	Definition
ACP	Asset Class Plan
AGA	ATCO Gas Australia Pty Ltd
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AGA	ATCO Gas Australia
ALARP	As Low as Reasonably Practicable
AMP	Asset Management Plan
AMS	Asset Management System
APGA	Australian Pipeline and Gas Association
AS	Australian Standard
ALS	Asset Lifecycle Strategies
CAPEX	Capital Expenditure
CBD	Central Business District
CBP	Corporate Business Plan
CEAR	Capital Expenditure Appropriation Request
CPI	Consumer Price Index
DBNGP	Dampier Bunbury Natural Gas Pipeline
DBYD	Dial Before You Dig
DFES	Department of Fire and Emergency Services
EIM	Enterprise Information Management
EMT	Emergency Management Team
ENA	Energy Networks Australia
EOL	End Of Life
EPA	Environmental Protection Authority
ERA	Economic Regulation Authority
ERMP	Emergency Response Management Plan
ERP	Emergency Response Plan
ESAA	Energy Supply Association of Australia
FERU	Field Emergency Response Unit
FMEA	Failure Mode and Effects Analysis
FMECA	Failure Mode Effects and Criticality Analyses
FPS	Fire Protection System
FSA	Formal Safety Assessments
GDS	Gas Distribution System
Guidelines	ERA 2019 Audit and Review Guidelines (Electricity and Gas Licenses)
GIS	Geographic Information Systems
GSR	Gas Standard Regulation
HAZOP	Hazard and Operability Study
HAZID	Hazard Identification Study
HPR	High Pressure Regulator
HSE	Health, Safety & Environment
IMT	Incident Management Team

IGC	Investment Governance Committee
ITP	Inspection Test Plan
JRA	Job Risk Assessment
KPI	Key Performance Indicator
Licensee	ATCO Gas Australia (AGA)
LPG	Liquefied Petroleum Gas
MGL	Mandurah Gas Lateral
MTBF	Mean Time Between Failures
MDR	Manufacturers Data Record
MOR	Master Obligations Register
MRP	Main Replacement Prioritisation
MSA	Master Services Agreement
MSTE	Meter Set & Telemetry
MTTR	Mean Time to Repair
MWSWGDS	Mid-West, South-West Gas Distribution System
NGA	Natural Gas Access
NGR	Natural Gas Rules
NPV	Net Present Value
OPEX	Operational Expenditure
ORMCC	Operational Risk Management & Compliance Committee
OTRP	Operations Total Resource Plan
PMM	Project Management Manual
PMP	Project Management Plan
POG	Pipeline Operators Group
PRS	Pressure Reduction Station
PTW	Permit to Work
RCM	Reliability Centered Maintenance
RMAP	Risk Management Action Plan
RCM	Reliability Centred Maintenance
RMC	Risk Management Committee
RMP	Risk Management Plan
SAP	Systems Application Products
SAMP	Strategic Asset Management Plan
SM	Scheduled maintenance
SMS	Safety Management System
SWI	Safe Work Instruction
UAFG	Unaccounted For Gas
UPS	Uninterruptible Power Supply