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ATCO Gas Australia Asset Management System Review

Review Report June 2017

Revision Status

Revision	Date	Description	Author		Reviewed	
			FirstName LastName	Position Title	FirstName LastName	Position Title
A	31/03/17	Draft				
B	04/04/17	Issue for Client Review	M. Sullivan	Principal Pipeline Engineer	D. Newman	Senior Pipeline Engineer
0	19/04/17	Issue for Use	M. Sullivan	Principal Pipeline Engineer	D. Newman	Senior Pipeline Engineer
1	27/04/17	Issue for Use	M. Sullivan	Principal Pipeline Engineer	D. Newman	Senior Pipeline Engineer
2	13/06/17	ERA Comments	M. Sullivan	Principal Pipeline Engineer	D. Newman	Senior Pipeline Engineer
3	20/06/17	ERA Comments	M. Sullivan	Principal Pipeline Engineer	D. Newman	Senior Pipeline Engineer

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Appendix 1 – Table of Documents Reviewed

1 Executive Summary

ATCO Gas Australia (AGA) is part of the ATCO Group of companies, which employs approximately 7,000 people and controls assets of approximately CAD$20 billion. The ATCO group delivers service in:

- Pipelines & Liquids - natural gas infrastructure development, transmission and distribution, natural gas liquids storage and processing, and industrial water solutions
- Electricity - power generation, distributed generation, and electricity distribution, transmission and infrastructure development
- Structures & Logistics - workforce housing, innovative modular facilities, construction, site support services and logistics, and operations management
- Retail Energy - electricity and natural gas retail sales.

The type of license held by AGA as the subject of this review is a Gas Distribution License (GDL 8) covering the Coastal (8), Great Southern (7) and Goldfield-Esperance (6) areas of WA. This comprises of approximately 14,000 km of low, medium and high pressure distribution pipelines, supplying over 740,000 customers. A map of GDL 8 coverage is shown in Figure 1.

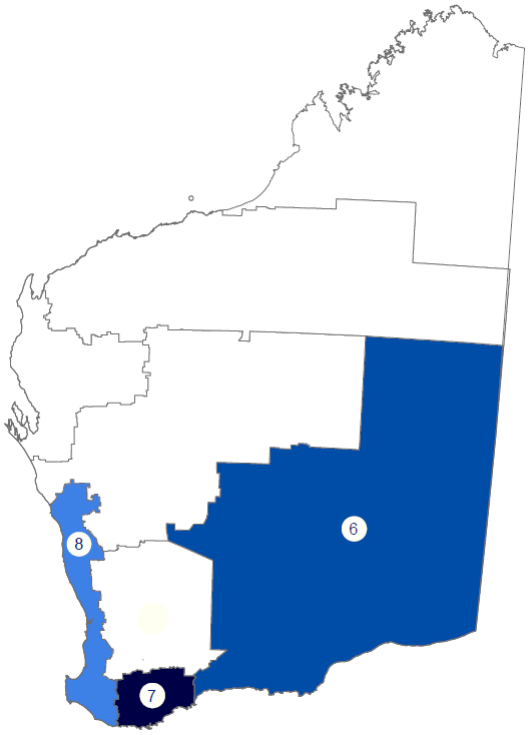

Figure 1: GDL 8 Licence Area Map

No major changes to the asset since the previous review have been identified.

1.1 Compliance Statement

This review report was prepared by Ausenco for AGA as per the requirements of *"Audit and Review Guidelines: Electricity and Gas Licences"*, published by the ERA, April 2014.

Michael Sullivan
Principal Pipeline Engineer
Ports, Transport and Terminals, APAC/Africa

Ausenco
Level 1 Podium, 44 St Georges Terrace I Perth WA 6000 I Australia
D: +61 8 6104 8501 I M: +61 4 270 89002 I E: michael.sullivan@ausenco.com

1.2 Summary Assessment of Actions from Previous Audit

Actions from previous audit (14) were assessed and their status updated during this 2017 review. All actions were adequately closed out by the AGA. Some minor opportunities for improvement in the implementation of these actions have been included as new recommendations the current audit outcomes.

Refer Section 4.1.1 for further detail.

1.3 Summary of Current Audit Outcomes

The opinion of the auditor on the control environment operated by the licensee is that it is performing effectively. The overall assessment of compliance with the licence is that the asset management systems are of sufficient definition and adequacy for the assets under management.

There were no deficiencies identified (rated C, D, 3 or 4) requiring mandatory actions as an outcome of the review. Recommendations arising from the current review observations have been summarised in each observation section, and should be considered discretionary opportunities for improvement.

Table 1 shows the ratings for each asset management area from the 2017 review giving an overall assessment of the effectiveness of the licensee's asset management system.

Table 1: 2017 Review Process Ratings

Process Area	Definition Adequacy Rating	Performance Rating
1. Asset Planning	B	2
2. Asset creation and acquisition	A	1
3. Asset disposal	B	1
4. Environmental analysis	B	2
5. Asset operations	A	1
6. Asset maintenance	B	2
7. Asset management information system	A	1
8. Risk management	B	2
9. Contingency planning	A	1

Process Area	Definition Adequacy Rating	Performance Rating
10. Financial planning	B	2
11. Capital expenditure planning	B	1
12. Review of AMS	B	2

1.4 Post Review Implementation Plan

The draft Asset Management System Review Report was issued to ATCO on 4 April 2017. ATCO confirmed that since there were no recommendation ratings (C, D, 3 or 4) requiring a mandatory post-review implementation plan, no plan was generated.

2 Introduction

ATCO Gas Australia Pty Ltd (AGA) engaged Ausenco to conduct an asset management system review of ATCO's Western Australian Gas Distribution Licence (GDL 8). Gas Distribution Licence GDL 8 Version 11, dated 1 January 2017 states that the Economic Regulation Authority has granted a distribution licence to AGA. The Gas Distribution Licence GDL 8 covers Coastal, Great Southern and Goldfield-Esperance areas of WA. This review covers the period 1 February 2014 to 31 January 2017 inclusive.

A formal kick-off meeting was held at the ATCO Jandakot office on 17th of February 2017 to provide an overview of the review scope and terms of reference. The proposed interview schedule was also agreed at the meeting. Review interview sessions were subsequently conducted at ATCO Jandakot between the 6th and 17th of March 2017.

2.1 Review Purpose

Section 11Y(1) of the Energy Coordination Act 1994 requires a gas distribution licensee, not less than once in every period of 24 months, (or such longer period as the Authority allows), calculated from the grant of the licence, provide the Economic Regulation Authority of Western Australia (ERA) with a report by an independent expert acceptable to the ERA as to the effectiveness of the system.

The following document presents the findings of the review as per the Review Plan and is in accordance with the requirements of "Audit and Review Guidelines: Electricity and Gas Licences", published by the ERA.

The review complied with the following Acts, Guidelines and Standards:

- Energy Coordination Act 1994
- Audit Guidelines: Electricity, Gas and Water Licences (the Guideline)
- Risk evaluation as per AS/NZS 31000:2009
- ASAE 3000 Standard on Assurance Engagements.

2.2 Review Objectives

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 GDL 8
- 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.

3 Methodology

The asset management system review includes an assessment of the adequacy and effectiveness of the asset management system by evaluating the 12 key processes of:

1. Asset planning
2. Asset creation/acquisition
3. Asset disposal
4. Environmental analysis
5. Asset operations
6. Asset maintenance
7. Asset management information system
8. Risk management
9. Contingency planning
10. Financial planning
11. Capital expenditure planning
12. Review of the Asset Management System (AMS).

The review was structured and evaluated for each of these key processes of the Asset Management System (AMS) managed by AGA, for the period 1 February 2014 to 31 January 2017, and the onsite review was conducted between 6th and 17th of March 2017.

The review includes an assessment of the measures taken by AGA for the proper management of assets used in the provision and operation of services and, where appropriate, the construction or alteration of relevant assets in accordance with the Economic Regulation Authority's (ERA) Audit and Review Guidelines: Electricity and Gas Licenses (AMS Review Guidelines) dated April 2014.

The review process comprised of the following aspects:

- Approval of Review Plan by AGA
- Approval of Review Plan by ERA
- Field review, including 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

- Approval of the Review Report and post-review implementation plan by ERA in the format specified by section 11 of the Audit Guidelines
- Action resolution for the Review Report action items or non-compliances.

3.1 Review Personnel

The review was performed out of the Ausenco Perth office under the management of Michael Sullivan, Principal Pipeline Engineer – Ports, Terminals & Transportation. The key strengths of the Ausenco review team are:

- All team members were engaged on the previous AMS review
- Significant asset management experience with gas pipeline and energy infrastructure
- Extensive design experience of gas utilities
- Extensive operational experience on high pressure gas pipelines
- Good knowledge of the AGA gas distribution network and procedures as team members have worked on numerous previous AGA projects.

Biographies for the key review personnel are given in Table 2.

Table 2: Review Personnel

Michael Sullivan **Principal Pipeline Engineer** **(Review Lead)**	Michael has 20 years' experience focused in gas pipeline design, commissioning, operations and maintenance. A significant amount of time has also been spent as a Senior Reliability Engineer in the minerals industry. His strengths include technical innovation, engineering leadership and mentoring. He has a passion for research and continuous improvement. Michael was a lead auditor on the previous AGA AMS review.
David Newman **Senior Pipeline Engineer**	David has over 12 years' engineering experience including both Design and Project Engineering/Management. He specialises in technical aspects of multi-discipline engineering and detail design, analytically based research and development, integral failsafe safety design, product risk reviews and development. As a pipeline engineer, David is value and solution driven, using initiative to create processes to improve efficiency within the design phase and has had significant experience with in-house manufacturing facilities. David's experience includes EPC projects, management plans, mechanical calculations, specifications, flow modelling and reporting, technical bid evaluations and on-going vendor interface (technical queries, documentation review, and inspection) to ensure the delivery of major pipeline projects across Australia.

Lauren Lynch **HSEC Specialist**	Lauren has 9 years' experience in safety, coupled with a background of 22 years in the health industry. Her experience includes third party regulatory auditor of expansion activities to the Dampier to Bunbury Natural Gas Pipeline, LTI free construction of 85km West Angelas Petroleum Pipeline and power station upgrade, and overseeing health and safety of contractors at iron ore mines. Lauren was an auditor on the previous AGA AMS review.

Table 3 summarises all the resources utilised and total hours for the generation of the AMS Review Report.

Table 3: Review Personnel Resource Hours

Resource Name	Review Role	Hours
M. Sullivan	Lead Auditor	174.5
D. Newman	Senior Auditor	85
L. Lynch	Senior Auditor	62.5
C. Hutchinson	Document & Cost Control	4.75
TOTAL		**326.75**

3.2 Field Review

Interviews with AGA staff and systems interrogation were carried out at the AGA Jandakot Maintenance Facility and Operational Centre, where the Asset Management System is centralised and managed.

3.3 Review Priority Rating

Using Table 15 of the ERA Audit and Review Guidelines, Inherent Risks and Adequacy of Previous Controls, the Ausenco Review plan determined the 2017 review priority ratings as shown by Table 4.

Table 4: 2017 Review Priority Ratings

Asset management system components	2014 Review Definition Adequacy Rating	2014 Review Performance Rating	Consequence (1=minor, 2=moderate, 3=major)	Likelihood (A=likely, B=probable, C=unlikely)	Inherent Risk (Low, Medium, High)	Adequacy of existing controls (S=strong, M=moderate, W=weak)	Review Priority
1. Asset Planning	A	1	2	C	Medium	Strong	4
2. Asset creation and acquisition	B	2	2	C	Medium	Moderate	4
3. Asset disposal	A	2	1	B	Low	Strong	5
4. Environmental analysis	A	2	2	B	Medium	Strong	4
5. Asset operations	A	1	3	C	High	Strong	2
6. Asset maintenance	B	2	3	B	High	Moderate	2
7. Asset management information systems	B	2	2	B	Medium	Moderate	4
8. Risk management	C	2	3	B	High	Weak	1
9. Contingency planning	B	1	3	C	High	Strong	2
10. Financial planning	A	1	1	B	Low	Strong	5
11. CAPEX planning	A	1	1	B	Low	Strong	5
12. Review of the AMS	B	2	2	B	Medium	Moderate	4

3.4 Interviewees

A summary of the interviewees for each process area is given below in Table 5.

Table 5: Interviewees

ID	Process Area	Interviewee/s
1	Asset Planning	Kim McArthur, Manager Asset Services Russell James, Senior Manager Capital Infrastructure
2	Asset creation and acquisition	Kim McArthur, Manager Asset Services Russell James, Senior Manager Capital Infrastructure Jim Richardson, Manager Engineering Services Sam Lee Mohan, Acting Manager Engineering Services Chris Olley, Project Engineer
3	Asset disposal	Kate Dunne, Finance Manager Kim McArthur, Manager Asset Services Russell James, Senior Manager Capital Infrastructure

ID	Process Area	Interviewee/s
4	Environmental analysis	Kim McArthur, Manager Asset Services Tony Yiu, Senior Manager Risk & Compliance Stuart Jobling, Manager Technical Compliance Christine Diprose, Quality & Assurance Officer Courtney Fitzsimmons, Senior Economic & Policy Advisor
5	Asset operations	Kim McArthur, Manager Asset Services Kelvin Grace, Manager Network Control Read Louw, Supervisor Control Room Sin Wei Lim, Asset Performance Engineer Lisa Jackson, Planner Mick McCarthy, Networks Regional Operations Manager Mark Turner, Acting Manager Network Control Michael Broomhead, Senior Trainer & Assessor
6	Asset maintenance	Kelvin Grace, Manager Network Control Kim McArthur, Manager Asset Services Lisa Jackson, Planner Mark Turner, Acting Manager Network Control
7	Asset management information systems	Kim McArthur, Manager Asset Services Tony Yiu, Senior Manager Risk & Compliance Jim Richardson, Manager Engineering Services Neil Butt, Senior Project Engineer Lisa Jackson, Planner
8	Risk management	Kim McArthur, Manager Asset Services Stuart Jobling, Manager Technical Compliance Tony Yiu, Senior Manager Risk & Compliance
9	Contingency planning	Kim McArthur, Manager Asset Services Stuart Jobling, Manager Technical Compliance Matthew Marshall, Manager Operations South
10	Financial planning	Kim McArthur, Manager Asset Services Kate Dunne, Finance Manager Tom Orchard, Financial Controller
11	CAPEX planning	Kim McArthur, Manager Asset Services Kate Dunne, Finance Manager
12	Review of the AMS	Tony Yiu, Senior Manager Risk & Compliance Kim McArthur, Manager Asset Services Tim Davies, Asset Planning Manager Christine Diprose, Quality & Assurance Officer

3.5 Documents Reviewed

Documents reviewed are listed in Appendix 1.

3.6 Definitions and Abbreviations

The definitions and abbreviations used in this document are tabulated below.

Table 6: Abbreviations List

Term or Abbreviation	Definition
ACP	Asset Class Plan
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AGA	ATCO Gas Australia
ALARP	As Low As Reasonably Practical
AMP	Asset Management Plan
AMS	Asset Management System
AS	Australian Standard
CAPEX	Capital Expenditure
CBD	Central Business District
CEAR	Capital Expenditure Appropriation Request
CPI	Consumer Price Index
DBP	Dampier to Bunbury 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
FSA	Formal Safety Assessment
GDL 8	Gas Distribution Licence 8

Term or Abbreviation	Definition
GDS	Gas Distribution System
GIS	Geographic Information Systems
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
MTBF	Mean Time Between Failures
MDR	Manufacturers Data Record
MOR	Master Obligations Register
MSA	Master Services Agreement
MSTE	Meter Set & Telemetry
MTTR	Mean Time To Repair
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
PRS	Pressure Regulating Station
PTW	Permit to Work
RCM	Reliability Centered Maintenance
RMAP	Risk Management Action Plan
RMC	Risk Management Committee

Term or Abbreviation	Definition
RMP	Risk Management Plan
SWI	Safe Work Instruction
UAFG	Unaccounted For Gas
UPS	Uninterruptible Power Supply

4 Previous Reviews

The previous review was conducted for the period 1 February 2011 to 31 January 2014 inclusive. Table 7 shows the ratings for each asset management area from the 2014 review.

Table 7: 2014 Review Process Ratings

Process Area	Definition Adequacy Rating	Performance Rating
1. Asset Planning	A	1
2. Asset creation and acquisition	B	2
3. Asset disposal	A	2
4. Environmental analysis	A	2
5. Asset operations	A	1
6. Asset maintenance	B	2
7. Asset management information system	B	2
8. Risk management	C	2
9. Contingency planning	B	1
10. Financial planning	A	1
11. Capital expenditure planning	A	1
12. Review of AMS	B	2

4.1.1 Previous Review Recommendations and Actions

The recommendations from the previous reviews and the status of actions taken to address these recommendations as updated during the review are given in Table 8.

Table 8: Previous Recommendations Resolved During Current Review Period

Table of Previous Review Ineffective Components Recommendations				
A. Resolved during current Review Period				
Reference (no./year)	**(Asset management effectiveness rating / Asset Management System Component & Criteria / details of the issue)**	**Auditors' Recommendation or action taken**	**Date Resolved**	**Further Action (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**
8.1/2014	C2 Risk Management	Review document control procedure to ensure document history captures record of review even if no changes were made to the document.	30/04/14	No
8.2/2014	C2 Risk Management	Formalise organisation (position & title) responsibilities for risk management.	30/09/14	No
8.3/2014	C2 Risk Management	Review of Action Register and Risk Assessment ownership and responsibility to clearly define how RMAPs are closed out and communicated for project/task/asset i.e. develop an action management procedure that clearly outlines responsibilities of various parties.	26/02/15	No
8.4/2014	C2 Risk Management	Utilise and advertise the intranet (upload as a document) to control the risk matrix version and avoid out-dated versions embedded in (risk management reference) documents and consider the inclusion of risk matrix in all risk management reports for traceability.	29/04/14	No
8.5/2014	C2 Risk Management	All blank document numbers in PMM to be cross checked.	17/09/14	No

Table of Previous Review Ineffective Components Recommendations				
A. Resolved during current Review Period				
Reference (no./year)	**(Asset management effectiveness rating / Asset Management System Component & Criteria / details of the issue)**	**Auditors' Recommendation or action taken**	**Date Resolved**	**Further Action (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**
8.6/2014	C2 Risk Management Engineering guidelines to not reference FSA process	Finalisation of the 'Engineering Services Design Guideline - Pipelines' and ensure that it references 'Guidance of Gas Distribution Formal Safety Assessments', particularly Appendix C for further information on requirements for FSA for different studies/assets.	22/04/14	No
8.7/2014	C2 Risk Management	Design guidelines references ENS GL0002 as Pipeline Design and Selection and not Engineering Services Design Guideline – Multi-storey Piping ENS GL 0002.	24/04/14	No
8.8/2014	C2 Risk Management	Engineering Services Design Guidelines Valves is not on server and missing link out of PMM (document number appears to be adopted to another document – ENS GL 0001).	27/05/14	No
8.9/2014	C2 Risk Management	Recommend referencing FSA in Design guidelines.	22/04/14	No

Table of Previous Review Ineffective Components Recommendations				
A. Resolved during current Review Period				
Reference (no./year)	**(Asset management effectiveness rating / Asset Management System Component & Criteria / details of the issue)**	**Auditors' Recommendation or action taken**	**Date Resolved**	**Further Action (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**
8.10/2014	C2 Risk Management	To improve standardisation and traceability of risk assessments, create a standard methodology to be used for issuing Terms of Reference; recording risk assessments; workshop participants and stakeholders; assignment of responsibility for RMAPs implementation, resource assessment and communications; residual risk assessment during FSA; reporting (inclusive of risk matrix used) and RMAPs close out process.	26/02/15	No
8.11/2014	C2 Risk Management	Implement re-assessment of 'high' and 'extreme' current risk RMAPs post RMAP closeout to demonstrate residual risk is ALARP.	26/02/15	No

5 Current Review Findings

The following sections summarise observations and recommendations arising from the interviews conducted as part of this 2017 review. A complete list of documents reviewed as evidence is included in Appendix 1.

The overall definition and adequacy rating for each component, was obtained by averaging the ratings for each effectiveness criteria, and rounding to the most conservative value.

5.1 Asset Planning

Key to this process element is that planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).

5.1.1 Observations

The *Asset Class Plans* (ACPs) are the strategies that drive the *Asset Management Plan* (AMP) which is moving towards a ten year outlook. Changes across consecutive annual AMPs demonstrate changes in strategy, for example, introduction of replacement projects for facilitates nearing end of life.

Although the strategies and associated financial planning appear to be sound, commentary with justification for changes in strategy was lacking from the AMP and ACPs.

ACPs observed were not strictly aligned with SAP equipment groupings, but grouped by major asset type e.g. pipelines; metering facilities; regulating; Cathodic Protection (CP) and telemetry.

Continuous improvement of service levels is implemented within criteria linked to benchmarks against industry peers. Benchmarking is through memberships with industry body groups (ENA and ESAA).

Forecast modelling is calibrated against actual historical pressure data and documented in *System Performance Reviews*. Evidence of high variance between modelled and actual data being the criteria for triggering action to maintain defined service levels was cited as an effective measure during interview sessions.

Overall lifecycle costs are well assessed and understood by AGA. Business cases contain detailed costs of creating, operating and disposing of assets. However the impact of recommendations for additional labour cited in the AMP was not clearly documented.

Regular risk assessments were evidenced cited including leak trend data analysis and documented in *Asset System and Health Performance Monitoring*. Sampling methods are employed where no online monitoring is available, triggered by Maximum Allowable Operating Pressure (MAOP) review on five year cycle for Class 600 steel mains. Risk is assessed in the context of geographical location and security of supply. Some misalignment of Australian Standard references with current editions was observed.

Revision history of key documents demonstrate alignment with regular review and revision, however Key Performance Indicators (KPIs) for each business unit were not traceable through the documentation back to drivers from the ATCO Business Plan.

5.1.2 Effectiveness Rating

The effectiveness criteria ratings based on observations for asset management system component 1 (Asset Planning) are listed in Table 9.

Table 9: Effectiveness Criteria Rating – Asset Planning

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
1 - Asset Planning				**B**	**2**
2017-1.1	4	Asset management plan covers key requirements. Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning.	AGA fulfils this requirement.	A	1

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
1 - Asset Planning				**B**	**2**
2017-1.2	4	Service levels defined.	AGA fulfils this requirement.	A	1
2017-1.3	4	Non-asset options are considered. Lifecycle costs are assessed and understood. Costs are justified and cost drivers identified.	The AMP does not clearly identify whether additional labour for AMP recommendations is externally sourced or has impact on O&M labour force.	B	1
2017-1.4	4	Funding options are evaluated.	AGA fulfils this requirement.	A	1
2017-1.5	4	Likelihood and consequences of failure are predicted.	Equipment criticality is assessed as required, but an opportunity for improvement would be the consolidation of asset criticality criteria and critical asset lists into the ACPs.	B	2
2017-1.6	4	Plans are regularly reviewed and updated.	AGA fulfils this requirement, but an opportunity for improvement is to clarify the “line of sight” of corporate strategies and KPIs through the business and asset planning documents.	B	1

5.1.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.2 Asset Creation and Acquisition

Key to this process element is that the provision for or improvement of an asset can be demonstrated to provide benefits beyond the year of outlay.

5.2.1 Observations

An overview presentation was provided for this process area. Engineering Services is responsible for providing engineering design, technical expertise for AGA GDS network operation, project engineering and management. The department also provide and maintain engineering and operational drawings to maintain AGA GDS.

The Asset Creation & Acquisition process is aligned with the Project Management Manual. The process is generally triggered by a customer request, user or 3rd party asset planning requirements e.g. relocation for other infrastructure works.

The following sample projects were reviewed to examine the process in detail:

- Commercial Gas Connection Process - New Commercial customer requiring Network reinforcement (High Pressure Regulator Set & Mains Extension) along with required User Specific Infrastructure (Large Meter Set, Gas Service Pipe and Telemetry equipment)

- CBD Risk Reduction - Network Infrastructure planning - network reinforcement identified from Asset Planning required installation of New High Pressure Regulator Sets and High Pressure Gas Pipeline.

The two examples provided different source triggers, one from a customer request, and the other from network infrastructure planning. Both examples explored alternative solutions, and preliminary risk evaluations were used to validate solutions.

Commercial Gas Connection

For the commercial gas connection example the following documents were cited as evidence:

- Customer Connection Enquiry
- Capital Expenditure Appropriation Request (CEAR) including business case
- Signed Project Management Plan PMP-2015-HS137.

The process commences with a new commercial customer typically contacting a gas retailer which in turn submits an online form which is distributed to engineering team and asset services via the customer connection enquiry.

The business case evaluated load requirements and route options which were modelled by Asset Services (option route from north or south or do nothing). All three options were cost estimated and compared for risk (including cost schedule and environmental). The CEAR, business case (contains evaluations, lifecycle costs, and key risks) lists the comparisons and proposes the preferred option. Cost estimating at this stage uses a mixture of internal rates and regional contractors/benchmark installation rates per meter). Project Management Manual PMM ENS-MA00001 provides guidance & framework, however it is not prescriptive for level of estimate (accuracy) required. The project management level required is dictated by cost and volume, which can range from a checklist through to a Project Management Plan.

Once the cost estimate is prepared, the proposal can be presented to customer. NPV needs to be neutral or positive which was cited in COM PR00007 Section 4.3 and 2.1 paragraph four. Operating costs are estimated using historical data. Modelling of financial options was cited in document “CGCE_[customer reference: confidential].doc”. Three options summarised in business case where lifecycle costs and risk assessment cited including missed opportunity cost analysis and recommendations based on both risk and CAPEX. Benchmark rates for secured contractor bundled works ensure accuracy of cost estimates.

Signed copies of Project Management Plan PMP-1521-2015-GCA1-BU-001 - HS137 and MSTE were cited which was dated after business case but prior to start up sheets.

Commissioning tests were cited via start up sheets “Gas Meter Start-Up Sheet (2015)”. The start-up sheets included sign off from inspector, commissioning details, equipment installed. Also cited were certificates including calibration date reference for test equipment, with reference to relevant test codes and constraints. Approval to gas up/operate is by Construction Manager sign off for operational readiness.

Commissioning documents (start-up sheets) are signed off for each asset. Cited examples (New Regulator Set HS137) of signed off ITPs and start up sheets required before assets can be brought online.

Start-up record and equipment details creates maintenance plan trigger in IBIS which triggers SAP input, generating notifications to assign maintenance plans to AMP teams. Cited notes on service (activities against maintenance plans).

MDR information was not in SAP, only in EIM, which is linked to equipment via identification number in field and EIM. WBS is used as project number. Example asset ID HS137 must be searched to obtain MDR but not searchable on WBS, thus requiring a staged search i.e. Asset ID search to find project title, then project title search to obtain MDR.

Maintenance plans are input into SAP to generate notifications of maintenance tasks.

CBD Risk Reduction

Document "20160516 CE CBD Risk Reduction Business Case Options" was cited which classed this as a tier 1 project. CBD Network Infrastructure Business Case CBD Risk Reduction Capital Expenditure (Sustaining CAPEX) 1521-2016-GCA1-NM-030 was cited which contained NPV, annual curves and monthly spend in SAP, also interrogated through approval process, utilising CAPEX, NPV and OPEX.

Feedback loop process for gathering and verifying customer data, though to assessing asset options and estimates defined by document Capital Contributions Procedure COM PR00007 which defines approval criteria for asset creation being neutral or positive NPV. CBD Risk Reduction references back to high level business items Page 4, and Section 2.1 for strategic alignment.

Sound Engineering practices and design were demonstrated via the PMP and design guideline which references the appropriate standards, Document PMP Guideline PMP ENS PL00002 Template was cited in addition to CBD - Risk Reduction Elizabeth Quay Reinforcement PMP-2016 NM030.

5.2.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 2 (Asset Creation and Acquisition) are listed in Table 10.

Table 10: Effectiveness Criteria Rating – Asset Creation and Acquisition

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
2 - Asset Creation and Acquisition				**A**	**1**
2017-2.1	4	Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions.	AGA fulfils this requirement.	A	1
2017-2.2	4	Evaluations include all life-cycle costs.	AGA fulfils this requirement.	A	1
2017-2.3	4	Projects reflect sound engineering and business decisions.	AGA fulfils this requirement.	A	1
2017-2.4	4	Commissioning tests are documented and completed.	AGA fulfils this requirement.	A	1
2017-2.5	4	Ongoing legal / environmental /	AGA fulfils this requirement.	A	1

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
2 - Asset Creation and Acquisition				**A**	**1**
		safety obligations of the asset owner are assigned and understood.			

5.2.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.3 Asset Disposal

Key to this element is that effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets.

5.3.1 Observations

It was examined if there is a defined criterion for deciding threshold for disposal during the interview. It was confirmed disposal is mostly risk driven where an example was given for cast iron mains being an underperforming asset (which have leak rates 15 times higher than mains of other materials) cited. This is subject to replacement program triggered by risk threshold being above network average. The document Unprotected Metallic Mains Replacement FSA TCO RP002 was cited as an example of a replacement strategy for an underperforming asset based on risk. This contained recommendations cited for phased replacement that were traceable to ACP DOC 2016 AMP AST PL0003.

An example of end of life gas meters was examined. Metering replacement is typical fixed at 18 years is but it was demonstrated via sample calibration testing at 15 years, change out could be deferred to 25 years based on accuracy. Letter “Replacement of Domestic Meters” to Mr Mas Marsuki at West Net Energy was cited as communication with Energy Safety and explains justification based on calibration sampling.

An example of suspending versus disposal was given when a large meter set was refurbished for another customer instead of disposing. The evaluation of the decision making process is not formally documented in any procedure. Another example of suspension was a single high pressure line for a commercial customer that was left in place for use by future potential customers.

Procedures for decommissioning, document were cited via ENS GL 009 Asset Retirement. This set out options for consideration in retiring including removal, refurbishment and re-use. It also considers environmental factors e.g. line size, location in determining actions e.g. fill pipeline with grout, air or inert gas by way of decision matrix.

The process for disconnection from existing network was demonstrated via documents SWI MA003 - Decommission Mains and NCN GL CO001 As-Built drawings - Services & Mains cited showing requirements for drawing updates for disconnected / decommissioned mains and procedure for feeding back into AMS. The drawing update is key change for triggering the update of AMS systems. The GIS system update then triggers DBYD system update. The GIS and SAP systems then update reciprocally.

An example for disposal or replacement strategy was reviewed with exposed pipework/bridge crossings. This investigated OPEX over lifecycle and risk analysis of sinking versus maintenance. Bridge crossing inspections identify maintenance activities and compare ongoing costs against replacement with a bored crossing. The OPEX analysis was cited comparing the cost of refurbishment versus replacement of the asset. Also cited was a condition inspection report for the same asset.

5.3.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 3 (Asset Disposal) are listed in Table 11.

Table 11: Effectiveness Criteria Rating – Asset Disposal

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
3 - Asset Disposal				**B**	**1**
2017-3.1	5	Under-utilised and under-performing assets are identified as part of a regular systematic review process.	AGA fulfils this requirement. Consider implementing criteria in ENS GL0009 for suspension / re-use of an asset verses decommissioning / disposal into the AGA asset planning documents.	B	1
2017-3.2	5	The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken.	AGA fulfils this requirement.	A	1
2017-3.3	5	Procedures for asset decommissioning disposal, sale or transfer to other authority. Disposal alternatives are evaluated.	AGA fulfils this requirement.	A	1
2017-3.4	5	There is a replacement strategy for assets.	AGA fulfils this requirement.	A	1

5.3.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.4 Environmental Analysis

Key to this element is that it examines the asset system environment and assesses all external factors affecting the asset system.

5.4.1 Observations

An overview presentation was provided for this process area. The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements.

The primary external factors for the current regulatory environment are mandated by the AER, EPA, Department of Commerce WA (Energy Safety / WorkSafe), AEMC, ERA (primary stake holder). It was noted that the responsibility for regulating third party access to covered (regulated) pipeline may eventually transition from the ERA to AER.

The access arrangement process occurs every 5 years via the ERA. The licence GDL8 was issued to AGA by the ERA which has responsibility for enforcement of the licence conditions. AGA is responsible for complying with its licence conditions. EnergySafety is responsible for the technical and safety regulations for gas distribution networks, including the safety case. The licence requires compliance with the Gas Standards Act 1972 but the requirements for the safety case are in the Gas Standards (Gas Supply and System Safety) Regulations 2000 which are managed by EnergySafety.

It was noted additional services that are outside the access arrangement are classed as unregulated services (e.g. gas for power generation). It was confirmed that approximately 95% of ATCO Gas Australia's revenue is currently covered by the access arrangement. The price cap is estimated on the amount of revenue required, therefore the demand forecast is critical.

ATCO Gas Australia is a key stakeholder for regulatory changes. The process is to review key regulations and impact i.e. for Gas Standards and monitor changes in addition to harmonisation laws. Every quarter, the Risk & Compliance team meet with Business Unit Leaders to consult and track progress of upcoming changes which includes existing versus new requirements and produce an impact statement. It was noted for licencing and reform Senior Manager Risk & Compliance is the direct point of contact including each Business Unit Leader for respective Laws.

Compliance includes reviews of contracts with suppliers and contractors. Responsibility to communicate changes is with the quarterly update to the Risk Committee (which includes the ATCO Managing Director, President and Executives. The Risk Management Committee charter was cited as evidence of this process. The Risk Compliance Committee Charter lists impact of changes to laws and regulations providing quarterly update detail.

The Technical Compliance area is responsible in accordance with the regulations to perform a 5 yearly review of the Safety Case including location class assessments and changes. The results are input into the Action Tracking System (RMAPS). The process revaluates via Formal Safety Assessments (FSAs) threats & failures and currency of controls. Examples were cited of impact assessments for upcoming and potential regulatory environment changes. Also cited were prompts to monitor and assess changes to regulations in the RMC. Other factors such as land use are covered by Safety Case (by Technical Compliance department) using GIS tools and proposals to best determine a 5 year forecast alignment with Safety Case.

An example of a threat analysis and corrective action was provided with the 2012 Incident Albany Remediation Project of Galvanised & Cast Iron Implementation, and the 2013 Albany FSA for improvements (leak survey techniques) which was completed 2015/2016.

The document "Albany Distribution FSA 2013 TCO RP0015 21 February 2012" couldn't be located on EIM. The FSA record template was located under the network, but no signed report. Also cited were actions linked to tracking register and tracked in to the document "AST PL00004 AMP - Albany LPG Network" (ACP 2012 Albany LPG Network). It was noted that this FSA was conducted prior to the start of this review period, and was only selected as there were still open action. Post interview ATCO confirmed that all FSAs conducted during this review period, complied with the requirements of TCO GL0001.

The area of performance standards was investigated. Examples of regulatory reports were reviewed which are issued monthly based on KPIs. KPIs for reliability and monitoring frequency are monitored internally. There are no external ERA licensing KPI requirements but metric for benchmarking are monitored and publically available. An example of performance standards was reviewed using the document "AST DS 001 2016 Operational KPIs" Table 1. Tracking the source of these KPIs is not in this document and support staff validates integrity of data based on previous reporting period.

Operational KPIs cited tracking of customer service measures including response time. Example cited for call centre KPI answer time of less than 60 seconds. KPI of 95% was not achieved last year and was traced into ERA annual performance report for 2015 identifying unforeseen 6 year high (spike) in call volumes. It was speculated root cause being higher numbers of new connections/activity. No link cited to further forecasting and resourcing based on this outcome.

An example of a regulatory change propagating through AMS was requested which could include an update on Obligations Register including licencing changes. Entry ID 230A of the Master Obligation Register (MOR) was cited as an example. Licensing requirements changed to require reconnection within 2 business days. ATCO cited safety issues with complying with this requirement and therefore discussed this with the ERA. The outcome was that regulations were updated with amendment to Clause to allow relaxation. The document Compendium of change Nov. 2014 update on www.erawa.com.au was cited as evidence. The document RMC Committee Paper- Quarterly updated cited Regulatory change timetable for 2014 with reference to amendment. Also cited was the quarterly risk email documenting submission to ERA.

5.4.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 4 (Environmental Analysis) are listed in Table 12.

Table 12: Effectiveness Criteria Rating – Environmental Analysis

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
4 - Environmental Analysis				**B**	**2**
2017-4.1	4	Opportunities and threats in the system environment are assessed.	TCO GL0001 Section 9 states that FSA records / reports to be placed in EIM. On one occasion, an identified FSA document was not in the proper location.	A	2
2017-4.2	4	Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved.	AGA fulfils this requirement.	A	1
2017-4.3	4	Compliance with statutory and regulatory requirements.	AGA fulfils this requirement. Consider tracking changes by date on Master Obligations Register. This makes it easier to reconcile with regulatory and other changes.	B	1
2017-4.4	4	Achievement of customer service levels.	AGA fulfils this requirement.	A	1

5.4.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.5 Asset Operations

Key to this process element is demonstration that operation functions relate to the day-to-day running of assets and directly affect service levels and costs.

5.5.1 Observations

An overview presentation was provided for this process area. Key Functions for Asset Operations were highlighted including Management, Call Centre, Data Management, Asset Services, Planning, Control Room, Customer Service & Maintenance, Systems Monitoring, and Pipeline & Facilities Maintenance.

The distinction of Operations versus Maintenance with respect to operational policies and how this affected maintenance (AMP) was raised during the review. Operational Strategy document “AST ST0004 Network Operating Strategy” was cited with reference back to AST PO 0001 and alignment with the Asset Management Policy for increasing capacity utilisation using near real-time monitoring. Also cited was reference to Gas Standard Regulations.

The coordination between the different departments under Operations and Engineering & Construction was also discussed. Equipment excursions or incidents are referred to Asset Services for investigation which interfaces with the Control Room. Depending on the magnitude of the change required after investigation (e.g. alarm setting change, or equipment modification) this is the responsibility of Engineering Services or Asset Services.

Cited document “Network Maintenance Strategy AST ST0002” which feeds into plan and aligns with business groups. Section 3 (Objectives) aligns the execution of group and defines criteria for operation strategies, separate and distinct from maintenance strategies.

Cited document “Network Maintenance Planning Strategy AST ST0003” which aligns with overall policy for three groups.

The Control Room has varied prescribed response levels, for example Australian Standard emergency response prescribes 2 hours whereas ATCO standard is 1 hour response time. Initial response form third party based on information supplied (e.g. rupture pipe or gas odour = Class 1) where class level described in document “AST DS 001 Operation KPIs” which was cited. This document also defines Control Room timing KPIs for pipeline 'break response' from when report is recorded into SAP from time call received. SAP gives actuals and auto generates email alarms to follow up prior to response time expiring.

Emergency Response priority 1 generated into SAP requires to be attended within 1 hour. This notification is sent to Control Room where gas controllers follow flow chart and escalate to Supervisor. Escalation Flow Chart in Emergency Response Plan DOC TCO_PL00001 cited with definition of level 1 - 4 event escalation corresponding task prioritisation based on risk.

SAP and IBIS form the basis for the asset register, and were reviewed live during the interview. It was observed the SAP linkage to other data systems could be improved. Certain assets created in GIS are then transferred to SAP. When interrogating an asset in GIS, then information from SAP

data is accessible. Medium Pressure mains drawings are in system, whereas High Pressure mains drawings are in a separate area.

Asset organisation in SAP is unable to show hierarchy and is essentially a flat structure. This makes it difficult to group equipment and sub-equipment in alignment with the Asset Class Plans. There also appears to be more classifications than listed in the Asset Class Plans.

An overview of the training process was provided and document “Training Management Process TRN PR0001” was cited. Each employee has a profile within the training database. The level of training for each area can include awareness only, or competency training. Skills assessments are conducted for recruitment and a training plan is developed for individuals / new starters. Document “TRN MA00003 - Site Safety and Environment Prerequisite Course” was cited and defines the process for identifying individual personnel training requirements. Additional asset training is undertaken before starting field work, then a period under supervision of an experienced person. Six months experience is required prior to being assessed for site competency. This is conducted by a competent person who is usually a subject matter expert. If identified, further training is arranged.

Some profiles require Cert. III in Gas Supply Operations, which is obtained from an external training provided. The SAP training profile lists relevant SWI - and if competent or trained and status. The Training Plan is managed and tracked in SAP indicating training completion and competency status for each candidate by task level and SWI. Cited example of employee training tracking search with expiry dates recorded for external courses.

Document “QLT PR 0007” was cited for the SWI Review and Sign Off Process. SAP has manually entered expiry dates and flagged. Each month, the Training Coordinator reviews and flags upcoming training for the next three months. The Training Procedure was cited for documented evidence.

If a person is not competent in a particular task it relies on the Supervisor knowing this task cannot be assigned (i.e. there is no preclusion in SAP for assigning work based on competence level). Each SWI also outlines mandatory competencies to complete task. During performance review each Supervisor and Team Member reviews their training plan and updates as required.

Document CERT III Training and New Starter Progression 2016 was cited and lists training plans by employees and dates. Monthly review training matrix and trainers / inspectors send supervisors emails to alert of upcoming expiry of certificates. Register was cross referenced and licences were cited in folder as evidence.

5.5.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 5 (Asset Operations) are listed in Table 13.

Table 13: Effectiveness Criteria Rating – Asset Operations

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
5 - Asset Operations				**A**	**1**
2017-5.1	2	Operational policies and procedures are documented and linked to service levels required.	AGA fulfils this requirement.	A	1

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
5 - Asset Operations				**A**	**1**
2017-5.2	2	Risk management is applied to prioritise operations tasks.	AGA fulfils this requirement.	A	1
2017-5.3	2	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.	AGA fulfils this requirement.	A	1
2017-5.4	2	Operational costs are measured and monitored.	AGA fulfils this requirement.	A	1
2017-5.5	2	Staff resources are adequate and staff receive training commensurate with their responsibilities.	AGA fulfils this requirement.	A	1

5.5.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.6 Asset Maintenance

Key to this process element is demonstration that maintenance functions relate to the upkeep of assets and directly affect service levels and costs.

5.6.1 Observations

An overview presentation was provided for this process area. Key Functions for Asset Maintenance were highlighted including the execution of maintenance plans to cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.

The primary source for maintenance planning, allocation and close out is SAP. Asset maintenance activity is generated and linked to asset with activity carried out and relevant information documented with service levels and costs being captured which are reviewed and maintenance plans are updated (from field reports, turnaround sheets, HSE reporting & trial information). Scheduled activity is generated from AMP (including SAP integration) whereas unscheduled activity can be generated from areas such as a field report (i.e. leak report). Information is also linked to asset or location via the GIS (IBIS). There are also prescribed service levels listed for each maintenance activity.

The document "Strategy Network Maintenance AST ST00002" was cited which outlines specific objectives for risk reduction to ALARP. It was requested the method for planned and preventative maintenance task frequency determination. Some task frequency is regulatory driven, others are based on experience and history. No formal Reliability Centered Maintenance (RCM) analysis or equivalent has been conducted to determine task type and frequency.

An example of pipework and meter sets maintenance was raised regarding corrosion grade. After inspections, corrosion is classified as 1, 2 or 3 which determines the prioritisation and repairs (e.g. level 2 is prioritised for next year, which then requires painting).

Pressure Regulating Station (PRS) inspection is conducted 4 monthly depending on pressure class. Medium pressure regulator sets are lower priority with inspections every 18 months, indicating risk based inspection has been implemented informally. Most regulator sets are singular and components are listed in overhead data sheets containing pressures. Cited HN085 SAP dump of maintenance plan for a typical regulator set. Also cited document ACP - Pressure Regulation Facilities AST PL00012.

It was raised during the interview if Mean Time Between Failure (MTBF) and Mean Time to Repair (MTTR) is analysed and set as performance KPIs. It was verified that Class 1 repairs have to be performed immediately which is documented and cited in ACP - Pipelines, Mains & Services AST PL00009. Within class 1, 2 and 3, KPIs are also defined in Safety Case and linked to AS4645 and further information was included in SWIs which described class leak plans.

KPI reports have leak per kilometre criteria listed. Link to ALARP was cited in procedure and KPI document “AST DS001”. This document lists a target for leaks on mains per 100km KPI <4.85 and KPI on leaks per survey <3 (rolling 5 years). Development of number / target and demonstrating ALARP is derived from ESAA survey Natural Gas distribution benchmarking report 2013-2014, which was cited. For KPI benchmarking, AGA uses historical rates / performance and ranking with other gas networks in Australia which provided justification of ALARP. It was cited ATCO documented performance was in top 40% demonstrating a cost effective balance of service level.

FSA identifies risks of mains leaks and current controls and examines effectiveness of surveys. This is linked to service levels and cascades down into lower documents. Currently patrol frequency adjusted based on asset performance / condition. This is annually reviewed through Pipeline Location Class report. It was requested during interview an example of adjustment and basis and evidence and trace through changes into SAP.

Cited example of ACP where it defined that Cathodic Protection (CP) protection status change of 'fair' to 'under-protected’ which subsequently triggered a frequency change in SAP. It was noted that CP results are not stored in SAP, paper copies are retained by Planner.

It was queried during the interview how maintenance tasks are prioritised for scheduling, including backlog. Maintenance tasks are prioritised based on qualitative risk assessment, asset condition report and judgement and experience of maintenance / planner / operator personnel. It is documented in ACP frequency and critical risk of asset as failure impact e.g. 4 month cycle indicates priority, and high frequency typically equates to high priority.

AGA’s SAP system does not automatically flag overdue maintenance tasks. It was noted that on the first business day of each month, overdue maintenance tasks are manually reported and escalated from Planner to Supervisor and Manager, who review outstanding work. If backlog hours become high, Supervisor will go to other departments to resource and train to bring in for support or relief. Evidence of Facilities Maintenance Monthly Report with status of maintenance items, tracking overdue items and identifying priority tasks was requested. “Outstanding_Jan_work.xls” document was cited as evidence.

Cited example of informal criticality assessment impacting inspection frequency for medium pressure regulators (non-back gassed), treated as an exception. SAP doesn't flag & rely on personnel but looking to improve with implementation of ISO 55000. ACP has assessed criticality of equipment, and doesn't flag corresponding priority not in SAP and relies on back log.

It was requested during the interview to provide an overview of equipment history retrieval from SAP. The equipment Function Location reference number is retrieved from SAP and then used to

search EIM for equipment data / documentation. The document linkage process is not intuitive and is still mostly paper based by planning department.

The monthly meeting variable volume reporting is generated by finance. At higher level goes into Operation Report OPEX monthly. Produce Monthly Tracking Sheet - volume based and finance use to track against costs to work out unit costs. Costs are monitored on a task basis so monitoring doesn't have visibility to individual equipment, being limited to an average across an asset class. However further interrogation can be achieved by searching SAP.

5.6.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 6 (Asset Maintenance) are listed in Table 14.

Table 14: Effectiveness Criteria Rating – Asset Maintenance

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
6 - Asset Maintenance				**B**	**2**
2017-6.1	2	Maintenance policies and procedures are documented and linked to service levels required.	AGA fulfils this requirement.	A	1
2017-6.2	2	Regular inspections are undertaken of asset performance and condition.	AGA fulfils this requirement.	A	1
2017-6.3	2	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule.	AGA fulfils this requirement.	A	1
2017-6.4	2	Failures are analysed and operational/maintenance plans adjusted where necessary.	AGA fulfils this requirement. Consider the consolidation or linking of asset condition monitoring data to SAP functional location for ease of use.	B	1
2017-6.5	2	Risk management is applied to prioritise maintenance tasks.	AGA fulfils this requirement. Consider automating the criticality of maintenance tasks in SAP (ideally by alignment with the risk matrix). This highlights prioritisation of backlog tasks.	B	2
2017-6.6	2	Maintenance costs are measured and monitored.	AGA fulfils this requirement.	A	1

5.6.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.7 Asset Management Information System

Key to this process element is demonstration that the combination of processes, data and software effectively support the asset management functions.

5.7.1 Observations

An overview presentation was provided for this process area. Key Functions for Asset Maintenance Information System were highlighted including the ability to provide authorised, complete and accurate information for the day-to-day running of the asset management system. The focus of the review was to examine the accuracy of performance information used by the licensee to monitor and report on service standards.

Information system work instructions have been generated with task based procedures rather than overall software manuals / procedures with screenshots from the relevant system, based and built into overarching processes. It was highlighted that data grouping is moving away from departmental discipline e.g. Engineering / Compliance etc. to asset based grouping with migration to the SharePoint system (EIM).

The document control procedure outlines controls and restrictions for users editing 'master' documents in the 'master copy area'. Access is limited to the document controller and a small 'extended team'. Email is used for approval for signing off documents. The document owner is notified of any document reviews / updates and is owner responsibility to notify personnel required to be aware of the change. Email approvals are stored in 'communications' folder with document storage location. All policy documents are wet signatures. The distribution method for field based document is via toolbox meetings. Internal procedures dictate distribution for office based documents. There is no formal distribution matrix for documents, as a 'catch all' the document controller issues monthly emails to key managers and supervisors with summary of changes. The document review cycle is captured in master document register QLT_PR0001 RG001 IMS which was cited as evidence. Examples of review cycle cited during interview and functionality of linkage to an example document demonstrated, it was noted however that dates in register did not align with dates on document.

For field personnel, document access is via Field Mobility Toughbooks. For Contractors, information is available from portal links for use on external mobile devices. SWIs are available on the Toughbook for employees, and contractors have a portal for SWIs. A working Toughbook Device was cited for Field Mobility. SWIs and SAP synced when in Wi-Fi range or when the device is docked at end of day. There is a check-in function upon arrival at SAP job, and completion. SAP also flags known risks e.g. confined space at job site.

It was noted during the interview that an Information Governance Framework was developed in 2016.

The data validation procedure RMT PR0001 Preparation and Submission of Annual Performance Report was cited. The ERA datasheet is used and distributed to personnel required to provide appropriate data as request with due date and ERA reporting requirements. Five year trending spreadsheet is used to validate data provided. This is cross checked with ERA requirements and definitions then signed off by data provider and management review. Individual data owners are responsible to determine their own data validation. Daily / monthly data validation basis is to be clarified in operations. ERA reporting data basis is from previously reported data so is not revalidated. ERA Compliance Data 2015/16 was cited.

Trends in data are monitored and Root Cause Analysis is applied where deviations from historical trends are observed e.g. UAFG - actual reports, monitor trends and replacement programs. It was stated that if there is an unusual change in data a root cause analysis is conducted.

It was confirmed during the interview that user passwords expire every six weeks and is managed by Wipro. This process is automated and restricts interference from system managers. Software licenses are also managed by Wipro. “Service Now” IT portal controls access to software and applications for access requests. Wipro "Service Now" is Service automation where employees can request and instigate workflow for Manager approval. The IT MSA was cited as evidence.

Call Centre WI CCT WI001 was cited, this has built in guide as induction which saves referencing other documents. It was confirmed that server room physical access on each floor was restricted to just several people within the business, with swipe pass control. The primary data centre is located in the Perth CBD and the Disaster Recovery (DR) Data centre is located in Belmont. There is redundancy at each centre which includes dual power feeds and UPS, diesel power generation and cooling redundancy. The network has dark fibre between primary and DR data centre, and between DR data centre and Jandakot. Primary data centre and Jandakot permits rerouting of systems communications if any connections are compromised. Data is backed up with tapes located in DR data centre. For critical business data there are four schedules including daily (3 day retention).

The MSA sets all procedures and KPI for redundancy and data retention. ATCO Canada also uses and has similar agreement with Wipro. The MSA includes failover testing requirements, however it was noted that fail over test of major systems has not been conducted to date, but is scheduled for December 2017. Document RMT PL00005 Business Continuity Plan was cited which documents processes for data recovery processes within AGA, and MSA.

5.7.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 7 (Asset Management Information System) are listed in Table 15.

Table 15: Effectiveness Criteria Rating – Asset Management Information System

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
7 - Asset Management Information System				**A**	**1**
2017-7.1	4	Adequate system documentation for users and IT operators.	AGA fulfils this requirement.	A	1
2017-7.2	4	Input controls include appropriate verification and validation of data entered into the system.	AGA fulfils this requirement.	A	1
2017-7.3	4	Logical security access controls appear adequate, such as passwords.	AGA fulfils this requirement.	A	1
2017-7.4	4	Physical security access controls appear adequate.	AGA fulfils this requirement.	A	1
2017-7.5	4	Data backup procedures appear adequate and backups are tested.	AGA fulfils this requirement.	A	1
2017-7.6	4	Key computations related to licensee performance reporting are materially accurate.	AGA fulfils this requirement.	A	1
2017-7.7	4	Management reports appear adequate for the licensee to monitor licence obligations.	AGA fulfils this requirement.	A	1

5.7.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.8 Risk Management

Key to this process element is demonstration that risks are identified and managed to an acceptable risk level.

5.8.1 Observations

The ATCO Risk Review and Audit Committee determine Corporate Risk Governance. Outline requirements and responsibilities of the committee (reference to Risk Management Committee) were cited in RMP. All material risks are documented in AGA's Corporate Risk Register.

All RMAPs are entered into the Action Tracking Register. AGA current maintains a separate risk register for each FSA. A consolidated risk register of FSAs is currently under development. All overdue actions are reported monthly. The highest risk or most overdue usually become projects (example of Albany Project - shallow pipe was presented). Technical Compliance Document Register TCO RG 0003 was cited.

TCO RP 0195 HAZOP report "Dark Green" Meter Set was cited and actions were covered in PMM. This item had not been entered into action register.

During 2016 more FSAs began to be conducted. There is no asset analysis of HAZOP actions. It was suggested that risk register could be used for AMP, as it is not formally referenced to analyse and group actions and risk register. General network FSA underpins safety case and are categorised by class (i.e. pressure) as opposed to location specific. This identifies the threats to the assets and consequence of failure, and has to be reviewed with safety case recertification every five years.

It was raised the AGA are currently investigating using pipeline failure data to quantify probability of puncture of pipeline (no failures to date). The business obtained a new software tool that enables providing quantitative risk scores for assets in late 2016, but had not been fully implemented by the end of this review period.

An example was cited for the risk summary from committee meeting 26-Oct-2016 demonstrating the development of a strategy to provide gas connections to high rise residential developments to mitigate risk of changes in urban growth and renewable energies. High Rise Strategy FSA TCO RP0193 01 March 2016 was cited during interview. Evidence of actions carried over to action register (12 plus sub-actions) cited. It is noted that approximately half of the actions are overdue even with revised due dates. Cited close out of one action through to Engineering Services Design Guideline High Rise ENS GL0012. Strategy solution not implemented until all actions are closed out.

Corporate risk is used for the implementation of assessed technical solutions on case-by-case basis through a Business Case. This is also the tool for internal management approval as well as reporting to ERA. Highest risks are determined by commercial risk and source data is from bottom up.

Business case for Metallic Main BC (2015) cited during interview including documented risk assessment. Evidence of Unprotected Metallic Mains followed through in AMP PL0003 2016-2020.

TCO PR0007 Permit to Work System in place to manage risk of works and was cited. Major work, e.g. major welding (large HP hot tap or welding onto metallic mains) is a three part process of approval involving Functional Manager, Manager Network Control with JRA with work program registering authority. AGA internally audited Permit to Work System and found training needed for JRAs and work permits (major). Permits are registered with Control Room, and entered into the Permit Register.

It was raised that HAZIDs were conducted for Albany Network 10 year inspection and remediation work, and were cited as evidence. Where risk is not only driver, e.g. economic trade-offs available, risk reviews encompass accounting for introduction of any new risks. Tracking register has been consolidated with system audit action register to produce a single action database. Risk scores are not noted in the action register (but may be found by referencing back to relevant report reference included in Tech Compliance Register TCO RG0003). High Risk >12 items are discussed at the quarterly risk committee meeting.

Project HAZOPs are usually facilitated by third parties and actions stay within project and are not reported in Action Register. Close out of these actions are through PMM. It was highlighted there is a potential disconnect between Engineering Services project FSAs and corporate risk action register. It is not formally documented to use risk register for discrete asset planning (AMPs). FSAs are typically facilitated by ATCO Technical Compliance department depending on pipe type, location etc. Major Project FSAs are usually one off workshops.

TCO PR0002 Management of Change cited during interview to manage technical changes to network. This document prompts changes to changing affected QLT and SWI documents (supporting documents list sources of change). Network Pressure Change NCO PR0013 (RG001) was cited during interview.

During the interview example of 2016 Change management for Personal Gas Monitors close out (linked from action register) followed through to source location was reviewed. Action approval was cited in SAP also linking to change folder source location. However checklist did not include risk review as reported and definition/criteria for Major vs Minor change not defined.

ACP's and network FSA's assess risk and consequence of asset failure at the asset class level and individually for critical assets such as PRSs, HPRs and pipelines MAOP 700kPa and above. Quantitative trend assessments such as leak and failure rates of asset using actual data are carried out (i.e. leak rates of cast iron mains are calculated using actual data to prioritise mains replacement). However individual quantitative assessments are currently not being carried out using actual data e.g. failure rates for all individual equipment items under asset classes. It was noted that failure rates from Third Party Interference for example are so low as to not be useful for establishing trends. DNV-GL risk tool is currently being implemented. This is being currently integrated into planning process for generating quantitative risk scores against specific assets.

5.8.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 8 (Risk Management) are listed in Table 16.

Table 16: Effectiveness Criteria Rating – Risk Management

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
8 - Risk Management				**B**	**2**
2017-8.13	1	Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system.	AGA fulfils this requirement. Consider updating procedure to define guidelines on requirements for where Permits to Work require escalation to JRA as currently left at discretion of personnel preparing permit. Consider also introducing link between PTW system and corporate RMP and procedure.	B	1
2017-8.14	1	Risks are documented in a risk register and treatment plans are actioned and monitored.	AGA fulfils this requirement. Consider including risk score or other mechanism to guide prioritisation of closing out overdue actions based on risk, and include direct links to source documents for action within Tech Compliance Register TCO RG0003. Consider implementing tool for analysis of repeating risks and escalate to RMP objectives.	B	2
2017-8.15	1	The probability and consequences of asset failure are regularly assessed.	AGA fulfils this requirement. Consider implementation of DNV-GL risk tool for analysing assets	B	1

5.8.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.9 Contingency Planning

Key to this process element is demonstration that contingency plans document the steps to effectively deal with the unexpected failure of an asset.

5.9.1 Observations

An overview presentation was provided for this process area. Key Functions for Contingency Planning were highlighted including the development and testing of contingency plans to minimise any significant disruptions to service standards.

Emergency Planning was reviewed during the interview. Technical Compliance has responsibility for planning ERP & management (updating & conducting drills and investigations). Users of ERP are operations, or capital infrastructure/Projects.

The management structure for and incident includes First Responders, Incident Management Team (IMT) and the Emergency Management Team (EMT). The IMT is the field response team led by a Network Operations duty or area supervisor/manager and is responsible for operational management of AGA's response and recovery at the incident site. The EMT is led by Duty Manager

and is responsible for managing operational and technical issues and to provide support to the Control Room and IMT.

Incident classification table in ERP is used to separate incident, emergency or crisis which is classified by Supply, Health and Safety, Environment, People, Reputation and then determine response guidance. Plan describes different types of incidents and corresponding responses. Cited during the review was document Crisis Management Plan RMT PL00003.

Incident flow chart & escalation process provides a guide from field, duty manager (which request EMT when required). This process is broadly aligned with corporate risk matrix.

ERP is primarily for Network related emergencies but also provides guidelines for depot emergency and bomb threats.

In 2014 ERP was revised to account for other emergencies and has hyperlinks to subordinated documents. Depots each have their own evacuation procedures.

Cited during interview was document “Network Isolation” that provides resources to EMT for valves, flow stopping etc. Plan also references schematics or plans for unplanned incidents and lists key isolation points for larger schematics and CL600 pipelines. It was verified that AGA has no remote isolation so must request isolation from DBP.

Document “Notifiable Incident Reporting Procedure TCO PR0003” was cited during review.

SWI “Attending Gas Escapes SWI GE 001” was cited and Section 7 provides a guideline to estimating gas loss. All first responders are trained and competent in this SWI.

Gas Distribution Notifiable Incident Reporting TCO PR0003 WI001 details level of investigation required and was cited during review.

It was noted AGA has quadrupled public presentations to raise awareness and as a result has had a reduction in pipeline strikes and notifiable gas releases.

ERMP Table 10 defines criteria for emergency exercises. Isolate zones are planned on location e.g. CBD versus one regional exercise per year.

During 2016 a pipe squeeze-off exercise was performed which enabled simulation of actual live pipe to isolate gas supply. For 2017 it is planned to deploy a deluge system exercise with DFES. Annually simulated shut down process with DBP and request pressure reduction are conducted.

Debriefs (hot) are conducted immediately after exercises, prior to formal reports being generated. Hot debrief and debrief report post actions are uploaded into Action Tracker (as cited in ERMP). Report for Kalgoorlie emergency response exercise conducted in November 2016 was cited as evidence. Work flow of actions uploaded into action tracker and closed out was demonstrated.

Emergency Response Management Plan TCO PL0001 was cited and it was noted that AGA were about to review and include in natural disasters. ERP roles and responsibilities documented in Section 3.

Pre-Incident Plans (21 in total) were cited and identified in ERMP prompt action for threats to network. These also define emergency exercise schedules per zone.

Emergency spares and equipment were reviewed, and it was confirmed that AGA keep their own fully stocked store. High pressure pipeline equipment has separate store and is labelled. Specialised flow stopping equipment and all standard equipment is kept on emergency response trailer. There is a fully equipped trailer located at each region. Field Emergency Response Unit (FERU) maintains that trailers are stocked with ER equipment and stores contain spares for all pipe sizes and fittings at each regional base.

Emergency exercise "TCO RP 0177 Emergency Exercise CBD2 Isolation 2015" was cited with observations and actions to close out.

The Geraldton incident investigation was reviewed as evidence of an incident process. This involved gas distribution pipeline damage by a third party civil contractor resulting in loss of containment. The SAP notice for the day shows gas release calculation result triggering escalation. Log was cited from EMT (recorded against notification) asset services perform an estimate of gas release, where email was cited from Asset Services, and Control to Energy Safety report. Incident Report "TCO RP0140 Gas Distribution Incident Report" to energy safety was cited. The actions from the incident were cited in the Action Tracker which included prevention awareness presentations to third party and a lists of Third Party Visits. It also specifies acceptance and presentations as evidence of action close out (evidence of presentation to West Coast Energy cited). Actions were also to identify three main key offenders per month, or unusual strikes, or new third party contractors working around assets and give awareness presentations.

5.9.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 9 (Contingency Planning) are listed in Table 17.

Table 17: Effectiveness Criteria Rating – Contingency Planning

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
9 - Contingency Planning				**A**	**1**
2017-9.1	2	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.	AGA fulfils this requirement.	A	1

5.9.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.10 Financial Planning

Key to this process element is demonstration that financial planning component of the AMP effectively brings together the financial elements of the service delivery to ensure its financial viability over the long term.

5.10.1 Observations

Corporate strategy and objectives input to AMP and hence CAPEX plan which also includes OPEX and Revenue to create a rolling five year Business Plan. During the third quarter each year the

budget plan is presented to the AGA Board for approval then during the fourth quarter it is presented to ATCO Parent Company for final approval.

The process for budget approval is conducted over a 15 month period. Fourth quarter sessions are conducted with the ATCO Group (Parent Company) which then feeds into the AMP for approval by April the following year. The OPEX planning is then combined to provide an overall CAPEX / OPEX budget. The timetable is aligned with the North American financial year.

The Financial Plan document references source information (CPI, wages etc.). The assumptions list is included and the plan is prepared for circulation early April each year by finance control. Business objectives are generated first in October the previous year which are collated by April / May, for input into CAPEX / OPEX budget.

The Business Plan Financial Submission 2017-2021 (5 year) was cited as evidence. This document outlines steps and key deliverables by responsible parties including due dates for every input into plan. It also shows the different CAPEX/OPEX reporting, reviews, draft budget, and final submission for approval.

Deadline for draft AMP requires forecasting for year in advance (6 months), due by June of each year for the following five year forecast period. The AMP is then incorporated into the Business Plan and approved by the end of calendar year for following year draft. Amendments are then made to draft (usually from OPEX focus).

It was requested during interview to provide if possible an example when the requested budget has been modified by ATCO corporate and how this process was conducted. It was noted that once AMP had been submitted and approved, no further revisions are made until the next planning period. It was also noted that the ATCO board has rarely rejected / modified AMP recommendations.

It was recommended during the review to document baselines and capture changes. The revision table of the AMP should include both submission and then final budget approval revision states. If budget items have been changed i.e. roll down of approved financial plan into AMP as revision to the current financial year AMP including commentary of revisions and where funds are reallocated. Works program is the forward focus of operations and maintained live, however final AMP should still reflect approved baseline. An example was cited where significant capital for the Two Rocks reinforcement was removed due to the ERA access arrangement decision which should have included commentary in current period AMP.

The ATCO Gas Australia Financing Input Model 081216 v1 was cited which showed the inputs and outputs of the rolling financial plan. Table cited in 2016 AMP shows CAPEX input rolls up to high level in financial model. Reconciliation was cited between the AMP and financial model for corresponding periods. The labour budget captures changes in organisation. It was not clearly identified if resourcing impacts from AMP are captured in operation manning and budget.

If new requirements occur before capital spend there is process for signalling and the requirement (e.g. safety/risk), then a review process is triggered for assessment and approval. It is initially a substitution, which depends on priority. CAPEX portfolio continually monitoring and may need reprioritise based on risk and prudent expenditure. The document “Management Report & WANH December 2016 P&L Report” was cited as evidence.

The limits for budget variations were discussed. No threshold for justification, but required for variances greater than $100k. This may result in corrective action but depend on justification.

Managers see reports and variances across business. Quarterly project review committee meets with ATCO Group to review variances from budgets (cited reporting of example $100k variance). Committee investigates significant variances and follows up on correct actions. Evaluation is also based on revenue, and is same for both CAPEX and OPEX. Market reporting requires full visibility across business, and is reported monthly.

The ATCO President receives monthly variances. If variation is significant the recording corrective action is taken. It was also highlighted that at 70% of CAPEX budget alerts are sent to responsible parties. Additional capital approval request is required at 105% of budget. Cost Centre reports are sent monthly to each responsible Manager.

5.10.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 10 (Financial Planning) are listed in Table 18.

Table 18: Effectiveness Criteria Rating – Financial Planning

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
10 - Financial Planning				**B**	**2**
2017-10.1	5	The financial plan states the financial objectives and strategies and actions to achieve the objectives.	AGA fulfils this requirement but an opportunity for improvement is to consider that the AMP incorporates at least two revision states for each year. These may include "submitted for budget approval" followed by "approved baseline budget". This captures any changes in AMP during budget approval period.	B	2
2017-10.2	5	The financial plan identifies the source of funds for capital expenditure and recurrent costs.	AGA fulfils this requirement but an opportunity for improvement is to consider any significant variances in forecast between consecutive AMP's is discussed in executive summary of AMP.	B	2
2017-10.3	5	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets).	AGA fulfils this requirement.	A	1
2017-10.4	5	The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period.	AGA fulfils this requirement.	A	1
2017-10.5	5	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services.	AGA fulfils this requirement, but an opportunity for improvement is to reference resourcing impacts and considerations into the AMP and the “line of sight” linkage to the business planning documents	B	1
2017-10.6	5	Significant variances in actual/budget income and expenses are identified and	AGA fulfils this requirement.	A	1

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
10 - Financial Planning				**B**	**2**
		corrective action taken where necessary.			

5.10.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.11 Capital Expenditure Planning

Key to this process element is demonstration that the plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years. Projections are normally expected to extend to at least ten years or longer where capital investments are large and with an irregular frequency, with projections over the first five years typically based on firm estimates.

5.11.1 Observations

The CAPEX Planning Business Plan commences in January each year for July approval and presentation to Board in September.

Once budget is approved CEAR is submitted and approved for the amount of expenditure.

IGC reviews and monitors expenditure targets on a monthly basis (ERA reporting is 5 yearly). Red zone is flagged if expenditure is greater 110% of CEAR value. Monthly IGC review meetings are attended by the AGA President, Finance Controller, Senior Manager Capital Infrastructure, Customer Engagement, Corporate Services and Legal) and discuss key CAPEX projects, approval, performance, expectations, planning & development.

Corrective action is instigated when WIP equates (reactive work and faults) to capital. This is tracked via the ERA reporting process.

Monitoring is conducted monthly with year to date performance which is provided to IGC.

The document “Works Program 2016 Dec 16 AMSR” was cited as evidence. This details month to month works programme, listing PM, CAPEX type and CEAR. Information includes CEAR approval amount and variances, indicators for LTD contains additional programs (customer).

Alternatives and options with decisions leading to projects are documented in Business Case, which is required for projects of over $100K in value.

It was queried during the interview what the estimating requirements are for budget versus CEAR. For budget / planning a high level estimate is generated and reviewed by regulator as part of access arrangement. Detail estimates are generated as part of project plan. CEAR and business case was cited for the commercial gas supply request.

Mains replacement programme was cited in AMP 2016-2021 and was cross referenced between Table 13 with 2016 works program "EOL Cast Iron" forecast to financial year completion. It was

noted that there were changes in pricing so AMP had to re-contract pricing. Record of originally amount plus addition was recorded in the Business Case. Access arrangement approval and justification was required for transferring from original budget.

It was queried during the interview if operational resourcing required for capital projects is incorporated in operational resource plan and budget. It was noted that certain programs use external contract resources and some used internal staff. Resource availability planned annually in AMP with respect to CAPEX distribution between self-execution and contracted works. Operational (maintenance) work take priority over capital for use of operation staff.

5.11.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 11 (Capital Expenditure Planning) are listed in Table 19.

Table 19: Effectiveness Criteria Rating – Capital Expenditure Planning

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
11 - Capital Expenditure Planning				**B**	**1**
2017-11.1	5	There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates.	AGA fulfils this requirement.	A	1
2017-11.2	5	The plan provides reasons for capital expenditure and timing of expenditure.	AGA fulfils this requirement.	A	1
2017-11.3	5	The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan.	AGA fulfils this requirement.	A	1
2017-11.4	5	There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned.	AGA fulfils this requirement, but an opportunity for improvement is to consider some commentary is given in OTRP for percentage of capital works (where operational resources are used) versus routine operation loading (planned maintenance activities). Justification is that currently only visibility is through monthly planning team meetings held for forward operations resource planning.	B	1

5.11.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

5.12 Review of Asset Management System

Key to this process element is demonstration that the Asset Management System (AMS) is regularly reviewed and updated.

5.12.1 Observations

An overview presentation was provided for this process area. Key Functions for Review of Asset Management System were highlighted to ensure the effectiveness of the integration of its components and their currency.

It was confirmed that the Institute of Asset Management provides the framework for AGA document structure.

The Strategic Asset Management phase which involves a significant SAP restructure is planned to go live on 24 June 2017. SAP is not currently aligned to the AGA AMS, and these changes will provide better alignment. It was also raised that the business was currently implementing Business Warehouse and Business Intelligence systems for improved data gathering and analysis.

The AGA business unit is currently undergoing reforms to align with actual AMS practices.

Operational performance and customer satisfaction is reported in monthly report. Performance Monitoring document AST DS001 AGA 2016 KPIs was cited. KPI sources include licence & regulatory requirements.

The Asset Management Plan contains objectives and improvements. Implementation of input drivers is primarily from the Access Arrangement which is conducted every 5 years. Document AST PR0004 Distribution System Performance Review was cited as evidence.

The Master Obligations Register (MOR) triggers change from sources such as code / regulatory changes, and prioritises implementation. Reference found cited to MOR in QLT MA00001 Integrated Management System Manual.

IMS QLT MA 00001 was cited for internal audit process. The 2017 Audit Plan allows for approximately 3000 hrs/year of audits. Systems of AMS are audited individually, with safety case elements audited periodically. The (internal) audit program is influenced by AGA parent company (ATCO Group). The Risk Committee (Board) is a corporate group & has a designated audit director. IMS internal audits cover aspects of AMS individually in addition to the ERA AMS review requirements.

The 2017 Audit plan schedule was cited. Responsibility and process for generating audit plans is not fully documented by written procedures. Audit focus informally cycled based on previous audit areas (frequency basis), regulatory audit requirements, high risk areas, and ATCO corporate requirements (e.g. lessons learned globally). Other inputs include tracked customer complaints and feedback (complaints tracked in SAP) requiring dynamic decision making by workshop to identify any other 'gaps' by Group Risk Committee (Canada). The 2015 Pipeline Integrity audit was noted to be due in internal audit plan. The current three year rolling audit plan was cited as approved. Audit program works centred around ISO certification audits.

Documented by QLT MA00001 Integrated Management System Manual defines roles and responsibilities.

The 2016 Project Management Audit ISO Checklist was cited. Actions are collated into report and then input into Action Tracking Register (shared with Technical Compliance department). TCO RG0003 Technical Compliance Document Register cited which included actions, due dates, audit categories, action assignments (owner/business unit). It was noted overdue audit actions are reported quarterly with tracking and monitoring.

Actions from performance report are input into AMP for network level or ACPs for asset specific actions. Linkages for source action input currently not documented but being built into documentation at present.

Section 9 (of QLT MA00001) Asset Performance uses multiple sources so AGA are currently progressing to a Business Warehouse system.

Customer complaints tracked in SAP. The target is for 20 call-outs per day. SAP job for complaint is raised from job task. Escalated complaints are estimated at 20 - 30 per year.

ORMCC Agenda (Risk Management and Compliance) is a whole of gas business, quarterly meeting.

Capacity modelling is based on forecast (using DNVGL Synergy program).

5.12.2 Effectiveness Rating

The effectiveness criteria ratings for asset management system component 12 (Review of AMS) are listed in Table 20.

Table 20: Effectiveness Criteria Rating – Review of AMS

Reference	Review Priority	Effectiveness Criteria	Summary of Observations	Definition	Adequacy
12 - Review of AMS				**B**	**2**
2017-12.1	4	A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current.	AGA fulfils this requirement, but an opportunity for improvement is to consolidate review completion / close-out dates of source documentation / audit actions to assist in the implementation of improvements into the business planning cycle and current review period.	B	2
2017-12.2	4	Independent reviews (e.g. internal audit) are performed of the asset management system.	AGA fulfils this requirement, but an opportunity for improvement is to consider choosing review areas on more risk based criteria. Distribution performance report not formally referenced by AMS. Consider linking distribution and asset performance plans to AMP actions.	B	2

5.12.3 Recommendations

No process deficiencies rated C, D, 3 or 4 have been identified, and therefore mandatory recommendations not required.

6 Conclusions

On the basis of evidence cited and interviews conducted with ATCO Gas Australia staff, the opinion of the Auditors is that AGA is operating an effective asset management system that has strong controls to maintain a high level of effectiveness.

It was noted that all actions from the previous review were addressed and closed out satisfactorily.

The effectiveness ratings shown in Table 1 illustrate the AGA achieved four maximum ratings for the twelve process areas. Performance ratings have improved since the last audit, and the lowest definition rating was B.

Since there were no effectiveness and performance ratings of C, D, 3 or 4 respectively, there is no mandatory requirement to action recommendations discussed in Section 1.3, and they can be considered opportunities for improvement.

It is recognised there has been a significant investment in improving the AMS during this review period, and positive progress has been observed. AGA has embarked on the implementation of required systems and processed to achieve ISO 55000 certification which should further improve the AMS.

Appendix 1 – Table of Documents Reviewed

File Name	Document Number	Revision	Title / Description
1521-2016-GCA1-SM-004_EOL_Replacement_-_Unprotected_Metallic_Mains.pdf	N/A	N/A	CEAR EOL Replacement - Unprotected Metallic Mains
2015_2016 ERA Performance Report Datasheet_data owners signoff.pdf	N/A	N/A	Gas Distributor Performance Report 2015/16
2015_2016 ERA Performance Report Datasheet_exec signoff.pdf	N/A	N/A	Gas Distributor Performance Report 2015/16
2015_CP_Annual_Rpt_Rev_0.pdf	2015-CP RPT	0	Cathodic Protection Annual Report
20161222_-_Pipeline_Patrol_301834239.pdf	N/A	N/A	Metro Pipeline Patrols
3.2_Risk_Register_-_ATCO_Gas_Australia.pdf	N/A	N/A	Risk Register
4.1_Compliance_Report_Dec_2016.pdf	N/A	N/A	Compliance Report December 2016
4.2 Regulatory_change_timetable Dec 2016.pdf	N/A	N/A	Regulatory Change Quarterly Update December 2016
AA-GOV-FWK-01 Information Management Governance Framework.pdf	AA-GOV-FWK-01	1	Information Management Governance Framework
AA-RSK-FWK-01_ATCO_Australia_POS_Risk_Management_Framework.pdf	AA-RSK-FWK-01	2	Australia POS Risk Management Framework
AGA IT AMP 2014-2019.pdf	AGA IT AMP	4	IT Asset Management Plan 2014-2019
AGA IT Strategy 2014-2019.pdf	N/A	N/A	Technology Strategy
AMSR 2017 Presentation - AMS Review.pptm	N/A	N/A	AMS Review Presentation
AMSR 2017 Presentation - Asset Creation Acquistion.pptm	N/A	N/A	Asset Creation Presentation
AMSR 2017 Presentation - Asset Maintenance.pptm	N/A	N/A	Asset Maintenance Presentation
AMSR 2017 Presentation - Asset MIS.pptm	N/A	N/A	Asset MIS Presentation
AMSR 2017 Presentation - Asset Operations.pptm	N/A	N/A	Asset Operations Presentation
AMSR 2017 Presentation - Asset Planning.pptm	N/A	N/A	Asset Planning Presentation
AMSR 2017 Presentation - Contingency Planning.pptm	N/A	N/A	Contingency Planning Presentation
AMSR 2017 Presentation - Environmental Anaylsis.pptm	N/A	N/A	Environmental Analysis Presentation
AMSR 2017 Presentation - Risk Management.pptm	N/A	N/A	Risk Management Presentation
AMSR 2017 Presentation Extract (5 year BP).pptm	N/A	N/A	5 Year Business Plan Extract
Approval_letter_from_ESD_replacement_of_domestic_meters.pdf	N/A	N/A	Letter from Energy Safety Regarding Metering Replacement
Approved_Business_case_&_CEAR_-_1521-2015-GCA1-BU-001_V_and_V_Walsh.pdf	N/A	N/A	CEAR & Business Case for V&V Walsh
AST DS 001 ATCO Gas Australia 2016 KPIs.pdf	AST DS 001	2	ATCO Gas Australia 2016 Operational KPI's
AST PL00003 Asset Management Plan 2014-2019.pdf	AST PL 00003	2	Asset Management Plan 2014-2019
AST PL00003 Asset Management Plan 2015-2019.pdf	AST PL 00003	1	Asset Management Plan 2015-2019
AST PL00004 Asset Management Plan - Albany Network.pdf	AST PL 00004	0	Albany LPG Network
AST PR0004 Distribution System Performance Review.pdf	AST PR 0004	0	Distribution System Performance Review
AST_PL00003_Asset_Management_Plan_2016-2020.pdf	AST PL 00003	2	Asset Management Plan 2016-2020
AST_PL00004_Asset_Management_Plan_-_Albany_Network.pdf	AST PL 00004	3	Asset Management Plan - Albany Network
AST_PL00006_Asset_Class_Plan_-_Cathodic_Protection_Systems.doc.pdf	AST PL00006	4	Asset Class Plan - Cathodic Protection Systems
AST_PL00009_Asset_Class_Plan_-_Pipelines,_Mains_and_Services.doc.pdf	AST PL00009	4	Asset Class Plan - Pipelines Mains and Services
AST_PL00010_Asset_Class_Plan_-_Metering_Facilities.doc.pdf	AST PL00010	6	Asset Class Plan - Metering Facilities
AST_PL00012_Asset_Class_Plan_-_Pressure_Regulating_Facilities.doc.pdf	AST PL00012	5	Asset Class Plan - Pressure Regulating Facilities
AST_PL00013_Asset_Class_Plan_-_Telemetry_Equipment.doc.pdf	AST PL00013	4	Asset Class Plan - Telemetry Equipment
AST_PL00016_Network_Planning_Design_Standard.pdf	AST PL00016	2	Network Planning Design Standard
AST_PL00017_MP_Development_Plan_2016.pdf	AST PL00017	1	Medium Pressure Development Plan 2016
AST_PL00018_AMP_-_Asset_Management_Plan_(AA4)_2014-2019.pdf	AST PL00018	0	Asset Management Plan (AA4) 2014-2019
AST_PO00001_Asset_Management_Policy.pdf	AST PO00001	4	Asset Management Policy
AST_PR0005_Assets_&_Systems_Performance_&_Health_Monitoring.docx.pdf	AST PR0005	0	Assets & Systems Performance & Health Monitoring
AST_ST00001_Network_Asset_Replacement_Strategy.pdf	AST ST00001	2	Nettwork Asset Replacementt Strategy
AST_ST00002_Network_Maintenance_Strategy.pdf	AST ST00002	3	Network Maintenance Strategy
AST_ST00003_Network_Planning_Strategy.pdf	AST ST00003	3	Network Planning Strategy
AST_ST00004_Network_Operating_Strategy.pdf	AST ST00004	4	Network Operating Strategy
AST_ST00007_Winter_Severity_Factor_Review.doc.pdf	AST ST00007	0	Winter Severity Factor Review
ATCO Gas Australia Gas db benchmarking report 2013-2014.pdf	N/A	N/A	Natural Gas Distribution Benchmarking Report 2013-14
Canning Bridge (Repair Replace).xlsx	N/A	N/A	Canning Bridge Financial Trade-off
CCT_WI001_Call_Centre_Work_Instruction.pdf	CCT WI001	4	Call Centre Work Instruction
CGCE_[redacted].doc	N/A	N/A	[redacted] Customer Connection Enquiry
Chandala_Brook_Pipe_Inspection_Report_-_2015.docx	N/A	N/A	Bridge Inspection Report
COM_PO00002_ATCO_Gas_Australia_Capital_Contributions_Policy.doc.pdf	COM PO00002	3	ATCO Gas Australia Capital Contributions Policy
COM_PR0007_Capital_Contributions_Procedure.pdf	COM PR0007	2	Capital Contributions Procedure
ENS GL 0012 Engineering Services Design Guideline Highrise.doc.pdf	ENS GL 0012	0	Engineering Services Design Guideline Highrise
ENS PL00002 RF01 Project Advice Checklist.docm	ENS PL00002 RF01	A	Project Advice Checklist
ENS_GL_0002_Engineering_Services_Design_Guideline_Multistorey.pdf	ENS GL 0002	6	Engineering Services Design Guideline Multistorey
ENS_GL0006_Damage_Prevention_Management_Guideline_for_ATCO_Gas_Facilities.docx.pdf	ENS GL0006	1	Damage Prevention Management Guideline for ATCO Gas Facilities
ENS_GL0009_Asset_Retirement.docx.pdf	ENS GL 0009	0	Asset Retirement
ENS_GL0011_Guideline_for_Estimating_Projects.docx.pdf	ENS GL0011	0	Guideline for Estimating Projects
ENS_MA00001_Project_Management_Manual.pdf	ENS MA00001	3	Project Management Manual
ENS_PR0001_Design_Control_and_Project_Management.pdf	ENS PR0001	6	Design Control and Project Management
ENS_PR0002_Meter_Set_Design_and_Selection.pdf	ENS PR0002	8	Meter Set Design and Selection
ENS_PR0018_Engineering_Services_Design_Guideline_Valves.pdf	ENS PR0018	4	Engineering Services Design Guideline Valves
ENS_PR0019_Engineering_Services_Design_Guideline_Pipelines.pdf	ENS PR0019	8	Engineering Services Design Guideline Pipelines
Gate Stations Flow Data 2016.xlsx	N/A	N/A	Gate Stations Flow Data 2016
Master Obligation Register.xlsx	N/A	N/A	Master Obligation Register
MSA (AGA) and Schedules (except Schedule J) EXECUTION VERSION.PDF	N/A	N/A	MSA (AGA) and Schedules (except Schedule J) EXECUTION VERSION
MSR PR0001 WI006 Work Instruction Reading Exceptions.pdf	MSR PR0001 WI006	3	Work Instruction Reading Exceptions
NCO PR0013 Network Pressure Management of Change.docx.pdf	NCO PR0013	0	Network Pressure Management of Change.docx
NCO PR0013 RG001 Network Pressure Change Register.xlsx	NCO PR0013 RG001	N/A	Network Pressure Change Register.xlsx
NCO_MA00001_Pipeline_Damage_Prevention_Manual.pdf	NCO MA00001	N/A	Pipeline Damage Prevention Manual
NPCRF004_model_75.pdf	N/A	N/A	NPCRF004 model 75
ORMCC_Dec_2016_Agenda_(AGA).pdf	N/A	N/A	ORMCC Dec 2016 Agenda (AGA)
outstanding Jan work.xlsx	N/A	N/A	outstanding Jan work.xlsx
PAC- 2016 Chandala Brook Muchea Bridge.docm	N/A	N/A	PAC- 2016 Chandala Brook Muchea Bridge
PLN_WI001_Planning_and_Maintenance.pdf	N/A	N/A	PLN WI001 Planning and Maintenance
PRS_Ballajura_Gas_Comp_Oct16.pdf	N/A	N/A	PRS Ballajura Gas Comp Oct16
QLT PR0001 RG001 IMS Controlled Document Register.xlsx	QLT PR0001 RG001 IMS	N/A	Controlled Document Register.xlsx
QLT PR0001 RG003A Field Operation Manual Index.pdf	QLT PR0001 RG003A	84	Field Operation Manual Index
QLT PR0001 RG003B Customer Service Manual Index.pdf	QLT PR0001 RG003B	59	Customer Service Manual Index
QLT PR0007 SWI Review and Sign Off Process.pdf	QLT PR0007 SWI	3	Review and Sign Off Process
QLT_MA00001_Integrated_Management_System_Manual.pdf	QLT MA00001	12	Integrated Management System Manual
QLT_PR0001_Document_Control_Procedure.pdf	QLT PR0001	6	Document Control Procedure
QLT_PR0001_RG003C_Mains_and_Service_Laying_Manual_Index.pdf	QLT PR0001 RG003C	58	Mains and Service Laying Manual Index
Regulatory_change_timetable_for_2014.docx	N/A	N/A	Regulatory change timetable for 2014
Risk Summary - Volume.docx	N/A	N/A	Risk Summary - Volume
RMT CH00001 Operational Risk Management Compliance Committee Charter.pdf	RMT CH00001	3	Operational Risk Management Compliance Committee Charter
RMT PR0001 Preparation and Submission of Annual Performance Report.pdf	RMT PR0001	2	Preparation and Submission of Annual Performance Report
RMT_PL00001_PR0002_Risk_Management_Procedure.pdf	RMT PL00001 PR0002	4	Risk Management Procedure
RMT_PL00001_PR0002_WI001_ATCO_Gas_Australia_Risk_Management_Matrix.docx.pdf	RMT PL00001 PR0002 WI001	0	ATCO Gas Australia Risk Management Matrix.docx
RMT_PO00001_Risk_Management_Policy.pdf	RMT PO00001	5	Risk Management Policy
SWI MA 010 Operation of Kal Odorant Facility (Weekly, Monthly and Annual Checks).docx.pdf	SWI MA 010	N/A	Operation of Kal Odorant Facility (Weekly, Monthly and Annual Checks)
SWI_ST_001_Pipeline_Patrol.pdf	SWI ST 001	3	Pipeline Patrol
TCO PR0002 Management of Change .pdf	TCO PR0002	5	Management of Change
TCO RP 0193 High Rise Strategy FSA Revision0.pdf	TCO RP 0193	0	High Rise Strategy FSA
TCO RP0177 Emergency Exercise CBD2 Isolation 2015.doc	TCO RP0177	N/A	Emergency Exercise CBD2 Isolation 2015
TCO_GL0001_Technical_Compliance_Risk_Management_Guideline.pdf	TCO GL0001	3	Technical Compliance Risk Management Guideline
TCO_PL00001_Emergency_Response_Management_Plan.pdf	TCO PL00001	5	Emergency Response Management Plan
TCO_PL00001_RF22_Incident_Escalation_Process_Map.pdf	TCO PL00001 RF22	2	Incident Escalation Process Map
TCO_PR0007__Permit_to_Work_System.pdf	TCO PR0007	12	Permit to Work System
TCO_PR0008_GDS_Risk_Register_(Action_Tracking).pdf	TCO PR0008	1	GDS Risk Register (Action Tracking)
TRN_PR0001_Training_Management_Process.pdf	TRN PR0001	6	Training Management Process
[redacted] signed_PMP.pdf	N/A	N/A	[redacted] signed PMP
WAGN_GDS_Safety_Case_Rev4.pdf	N/A	N/A	WAGN GDS Safety Case Rev4