# ATCO Gas Australia

## Review Report

## Asset Management System Review

**12 June 2014**

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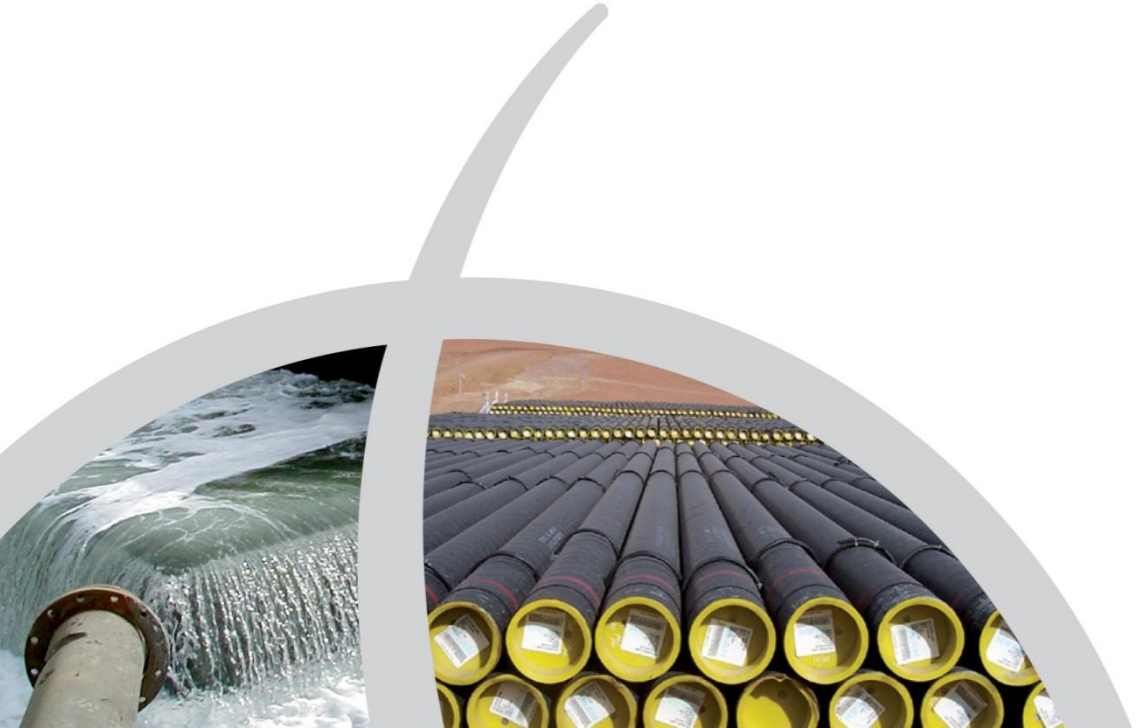
Revision 4



Level 15 St Martins Tower
44 St Georges Terrace
Perth WA 6000
tel +61 8 9320 0400

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| Rev | Status | Prepared by | Checked by | Approved by | Date |
|---|---|---|---|---|---|
| 0 | Issued For Use | Markus Kern<br>Principal IC&E Engineer | Lauren Lynch<br>Health & Safety Manager | Ian Christie<br>General Manager - West | 28/04/14 |
| 1 | Issued For Use | Markus Kern<br>Principal IC&E Engineer | Lauren Lynch<br>Health & Safety Manager | Ian Christie<br>General Manager - West | 09/05/14 |
| 2 | Issued For Use | Markus Kern<br>Principal IC&E Engineer | Lauren Lynch<br>Health & Safety Manager | Ian Christie<br>General Manager - West | 23/05/14 |
| 3 | Issued For Use | Michael Sullivan<br>Principal Mechanical Engineer | Lauren Lynch<br>Health & Safety Manager | Ian Christie<br>General Manager - West | 12/06/14 |
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| | | | | | |

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# 1 Executive Summary

Section 11Y (1) of the Energy Coordination Act 1994 requires ATCO Gas Australia to provide to the Economic Regulatory Authority (ERA), a report, compiled by an acceptable independent expert, as to the effectiveness of the Asset Management System. This report details findings of the ATCO Gas Australia Pty Ltd asset management review conducted by OSD limited during February 2014.

The 2013 Distribution Licence GDL8 states that the Economic Regulation Authority has granted a distribution licence to ATCO Gas Australia. The Gas Distribution Licence GDL 8 covers Coastal, Great Southern and Goldfield-Esperance areas of WA. This review covers the period 1 February 2011 to 31 January 2014 inclusive.

The ATCO Gas Australia asset management system was reviewed in accordance with the Audit Guidelines: Electricity, Gas and Water Licences, Economic Regulation Authority (the Authority), WA and OSD Pipelines Review Plan (130400-PM-REP-001 Rev B). In summary; it was found that ATCO Gas Australia has a functioning asset management system which requires some improvement, details of which are discussed in section 3 of this report. It is evidenced that ATCO Gas Australia has embarked on a continuous improvement path with respect to its overall asset management and its systems, with the review identifying the need for improvement in particular with how risk is managed.

In summary, 27 recommendations were made for the current review. Tabled below is a summary of the 2014 review recommendations. The status of the previous review recommendations are included in section 3.3.

**Table 1.1: Recommendation Summary**

| # | Process Area | Recommendation |
|---|---|---|
| 1.1 | Asset planning | Extend the inclusion of actual integrity data to assess useful asset life in other Asset class plans, similar to the Asset class plan for pipelines, mains and services. |
| 1.2 | Asset planning | Formalise within Asset Class Plans strategy for dealing with Aging Asset. |
| 2.1 | Asset creation & acquisition | Improve document numbering as several instances of missing and number duplications have been noted. i.e. The design Guidelines – Pipelines (ENS PR0019) has document numbering missing in appendix 1 (Guidelines on Gas Distribution FSA), Document number missing from Business case etc. |
| 2.2 | Asset creation & acquisition | Implement process to ensure all new project hard copy documents are scanned and published in DMS. |
| 3.1 | Asset Disposal | Procedure needs to incorporate close out requirements and parties to be informed (e.g. drafting, asset services etc.) |
| 4.1 | Environmental analysis | Reference corporate risk register into business plan and link to the AMP. |
| 4.2 | Environmental analysis | Develop process to ensure all reference/template documents are controlled, and key non-controlled documents contain sufficient identification and revision information. |
| 5.1 | Asset operations | Link SAP asset numbers, drawing numbers and reference documents. |
| 6.1 | Asset maintenance | Recommend formalising a location class review to support interval of pipeline patrols, and determine relevance to today's class, activity and subsequent patrol level (considering urban development). Assess |

| # | Process Area | Recommendation |
|---|---|---|
| | | location specific risk, current activity and density to pipes. Found Class 600 pipes, rural which were traditionally R1, however the Metro area expanding now encompasses some of these pipelines. |
| 6.2 | Asset maintenance | Recommend thorough integration and referencing of strategic documents such as Damage Prevention Guidelines into Project Management Plans, Plans and Templates. Additionally, blank document numbers referenced in PMP to be crosschecked for correctness. |
| 7.1 | AMIS | Develop an overall work execution procedure covering maintenance activities from end to end |
| 7.2 | AMIS | Consideration for making Call Centre Quick Reference Guide a formal procedure |
| 8.1 | Risk management | Review document control procedure to ensure document history captures record of review even if no changes were made to the document. |
| 8.2 | Risk management | Formalise organisation (Position & title) responsibilities for risk management. |
| 8.3 | 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. |
| 8.4 | 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. |
| 8.5 | Risk management | All blank document numbers in PMM to be cross checked |
| 8.6 | Risk management | 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. |
| 8.7 | Risk management | Design guidelines references ENS GL0002 as Pipeline Design and Selection and not Engineering Services Design Guideline – Multistorey Piping ENS GL 0002 |
| 8.8 | 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) |
| 8.9 | Risk management | Recommend referencing FSA in Design guidelines |
| 8.10 | 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. |
| 8.11 | Risk management | Implement re-assessment of ‘high’ and ‘extreme’ current risk RMAPs post RMAP closeout to demonstrate residual risk is ALARP. |
| 9.1 | Contingency planning | Remove Plan from Work Instruction and incorporate into separate document |

| # | Process Area | Recommendation |
|---|---|---|
| 9.2 | Contingency planning | Update working within WI002 to refer to correct action-tracking register. |
| 12.1 | Review of AMS | Update AMS Strategy |
| 12.2 | Review of AMS | Develop internal auditing plan for AMS. |

## 1.1 Compliance Statement

OSD Limited for ATCO Gas Australia Pty Ltd prepared this report to the requirements' of Audit guidelines*: Electricity, Gas and Water Licences,* Economic Regulation Authority Western Australia, August 2010.

**Markus Kern**

Principal ICE Engineer
Level 15, St Martins Tower
44 ST Georges Terrace,
Perth WA 6000
Date: 4th April 2014

# 2 Review

## 2.1 Background

ATCO Gas Australia Pty Ltd (hereinafter "AGA") headquartered in Perth, and is part of the ATCO Group of Companies, a diversified international corporation engaged in structures and logistics, utilities, energy and technology. From its Canadian base in Alberta, ATCO Group is focussed on delivering service excellence and innovative business solutions throughout their operations on five continents.

AGA builds, owns and maintains an underground network of pipelines that bring natural gas to more than 683,000 West Australians. AGA's distribution network covers the Perth greater metropolitan area, Albany, Brunswick Junction, Bunbury, Busselton, Capel, Geraldton, Harvey, Kalgoorlie, and Pinjarra. The AGA distribution network has seen expansion to approximately 13,500 km of natural gas pipelines. The Perth metropolitan area is growing to meet the city's swelling population—one of the fastest rates in the developed world.

### 2.1.1 Albany Gas Network Explosion

AGA operates the reticulated LPG distribution network in Albany, as previously outlined. During the review period in July 2012, there was an explosion and fire at a residential property in Albany that resulted in a fatality and serious burns to another. The cause of the incident was found by the Coroners Court to be due to an accumulation of LPG that had escaped from a misaligned mechanical

coupling on the Albany distribution network adjacent to the property. The Coroner made no findings of fault against AGA. Following the incident, AGA has taken a number of actions, including:

- Continuing to review and update its procedures and Safe Work Instructions consistent with the approach of achieving best practice and learning from operational experience
- In conjunction with EnergySafety, AGA undertook tests on mechanical couplings used in the Albany network;
- Identified and replaced all compression couplings that were identified in leak survey to be leaking;
- Accelerated replacement of galvanised gas main with PE pipe;
- Continued with its program to replace the remaining cast iron and galvanised gas service;
- Embarked on a public awareness campaign to increase knowledge and understanding of gas in the Albany community.

## 2.2 Context

Section 11Y (1) of the Energy Coordination Act 1994 requires a licencee to provide to the Economic Regulatory Authority (ERA), a report, compiled by an acceptable independent expert, as to the effectiveness of the Asset Management System.

AGA has engaged OSD to conduct this asset management system review of AGA's Western Australian gas distribution licence GDL 8. The 2013 Distribution Licence GDL8 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. The review will cover the period 1 February 2011 to 31 January 2014 inclusive. A draft review report is to be submitted to ERA by 30 April 2014, and revised following receipt of comments.

The review was conducted in accordance with the Audit Guidelines: Electricity, Gas and Water Licences, Economic Regulation Authority (the Authority), WA, which identifies 12 key processes of an asset management sytem. Each key process was addressed individually by the review, for which specific review worksheet had been prepared and are included in Appendix A.

The review was conducted in accordance with the following guidelines and/or standards:

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

## 2.3 Objective

The objective of this review is to:

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

## 2.4 Requirements

In accordance with the ERA Audit Guidelines, the asset management system review focused on the asset management system, including asset management plans, which set out the measures that are to be taken by the licensee for the proper operation and maintenance of assets. The plans must convey the licensee's business strategies to ensure the effective management of assets over at least a five year period.

The Audit Guidelines stipulate that the primary objective of the review is to assess the effectiveness of measures taken by the licensee to ensure effective management of assets. The ERA requires the reviews to utilise a risk based approach to planning and conducting the review. In accordance with AS 4360:2004 (which is now AS/NZS 31000:2009), there should be more extensive audit testing of higher risk areas to provide sufficient assurance of compliance or effective control.

To this end the review priority is detailed in section 2.9, whilst the review worksheets utilised are contained in appendix A.

## 2.5 Methodology

OSD Limited conducted the Review based on the Authority's Audit Guidelines: Electricity, Gas and Water Licences. The Review process comprised the following aspects:

- Utilised the approved Review Plan.
- Conducted field review, including a review of documentation and systems, a review of the actions taken in response to the recommendations from the previous review (summarised in section 3.3), a review of legislative documentation and interviews with relevant personnel from the AGA business.
- 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.
- Implementation or actioning of Review Report action items.

## 2.6 Scope

Asset Management System review of AGA's West Australian gas distribution licence GDL 8 with the following review objectives:

- 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 AMS processes.
- Detail action items or recommendation for improvement of the AMS.

The scope of the audit and reporting covers the 12 key processes as stipulated by the ERA:

1. Asset planning
2. Asset creation/acquisition
3. Asset disposal
4. Environmental analysis

5. Asset operations
6. Asset maintenance
7. Asset management information systems
8. Risk management
9. Contingency planning
10. Financial planning
11. Capital expenditure (CAPEX) planning
12. Review of the Asset Management System

## 2.7 Abbreviations

| Abbreviation | Definition |
|---|---|
| ACP | Asset Class Plan |
| AGA | ATCO Gas Australia Pty Ltd |
| ALARP | As Low As Reasonably Practicable |
| AMS | Asset Management System |
| AS | Australian Standard |
| AVT | Accuracy Verification Test |
| DMS | Document Management System |
| CAPEX | Capital Expenditure |
| EIM | Enterprise Information Management |
| ERA | Economic Regulation Authority |
| FMEA | Failure Modes and Effects Analysis |
| FSA | Formal Safety Assessment |
| GDL 8 | Gas Distribution Licence 8 |
| HAZOP | Hazard and Operability Study |
| ITP | Inspection Test Plan |
| KPI | Key Performance Indicator |
| Licensee | ATCO Gas Australia (AGA) |
| MDR | Manufacturers Data Record |
| NPV | Net Present Value |
| OPEX | Operational Expenditure |
| ORMCC | Operational Risk Management and Compliance Committee |
| OSD | OSD Limited |
| PTW | Permit to Work |
| RMAP | Risk Management Action Plan |
| SAP | Systems Applications Products |

| Abbreviation | Definition |
|---|---|
| SWOT | Strength, Weaknesses, Opportunities, Threats |
| UAFG | Unaccounted for Gas |
| WA | Western Australia |
| WAGN | WA Gas Networks |

## 2.8 Review Personnel

Details of review personnel are included in the audit plan. Summarised below are audit personnel and hours utilised.

**Table 2.1: Review Personnel**

| Name | Role | Hours Utilised |
|---|---|---|
| Markus Kern | Lead Auditor | 211 |
| Michael Sullivan | Senior Auditor | 12 |
| Lauren Lynch | Auditor | 55 |
| Eric Wong | Auditor | 8 |

## 2.9 Field Review

The field reviews were conducted at Jandakot, Albany and Kalgoorlie during February and March of 2014, and a thorough review of AGA documentation and interviews led to findings. Refer sections 3.1 Interviewees and 3.2 Documents, respectively. All relevant documentation was made available to review personnel. AGA also made relevant asset management and operational staff available for interviews as and when it was required. Consistent with ASAE 31000, OSD Limited adopted an approach of professional scepticism throughout the review. ASAE 31000 (paragraph 11(a)) states that having an attitude of professional scepticism "means the assurance practitioner makes a critical assessment, with a questioning mind, of the validity of evidence obtained and is alert to evidence that contradicts or brings into question the reliability of documents and responses to enquiries and other information obtained from management and the responsible party".

The asset management system was reviewed using the Protocol and worksheets from Appendix A that was based on the criteria articulated in Table 16, Appendix 4 (A Guide to the AMS Effectiveness Framework), *Audit Guidelines, Electricity, Gas and Water Licences*, Economic Regulation Authority, WA.

The review also included previous audit actions to verify that actions have been completed, consider actions that are not yet complete and incorporate those actions into the current review action plan.

The review incorporated a review of documentation and systems, a review of legislative documentation and interviews with relevant personnel from the AGA business, in the locations stated above.

## 2.10 Review Priority Rating

Detailed below is the review priority rating, determined as part of the Review Plan in accordance with the ERA Audit Guidelines: Electricity, Gas and Water Licence. The review priority assessment utilised an aggregate priority assessment methodology, and based on the risk of each key process combined with the deficiencies identified in the previous review conducted in 2011.

**Table 2.2: Review Priority Rating**

| Ref | Process Area | Consequence | Likelihood | Inherent Risk | Adequacy of Existing Controls | Review Priority |
|---|---|---|---|---|---|---|
| 1 | Asset Planning | 2 | C | Medium | Strong | **4** |
| 2 | Asset creation and acquisition | 2 | C | Medium | Weak | **3** |
| 3 | Asset disposal | 1 | B | Low | Strong | **5** |
| 4 | Environmental analysis | 2 | B | Medium | Strong | **4** |
| 5 | Asset operations | 3 | C | High | Moderate | **2** |
| 6 | Asset maintenance | 3 | B | High | Moderate | **2** |
| 7 | Asset management information systems | 2 | B | Medium | Moderate | **4** |
| 8 | Risk management | 3 | B | High | Moderate | **2** |
| 9 | Contingency planning | 3 | C | High | Moderate | **2** |
| 10 | Financial planning | 1 | B | Low | Strong | **5** |
| 11 | CAPEX planning | 1 | B | Low | Strong | **5** |
| 12 | Review of the AMS | 2 | B | Medium | Moderate | **4** |

# 3 Review Findings

## 3.1 Interviewees

The following AGA personnel were interviewed during the asset management review:

**Table 3.1: Interviewees**

| Name | Role | Location |
|---|---|---|
| Tony Yiu | Risk, Compliance and Internal Audit Manager | Jandakot |
| Dean Solmundson | Senior Manager Engineering & Compliance | Jandakot |
| Tim Davies | Asset Planning Manager | Jandakot |
| Jim Richardson | Manager Engineering Services | Jandakot |
| Stuart Jobling | Technical Compliance Manager | Jandakot |
| Kelvin Grace | Manager, Network Control | Jandakot |
| Christine Diprose | Quality & Assurance Officer | Jandakot |
| Maswadi Marsuki | Manager Asset Services | Jandakot |
| Stephen Hughes | Senior Manager Capital Infrastructure | Jandakot |

| Name | Role | Location |
|---|---|---|
| Stephen Trewhella | Manager Organisational Development | Jandakot |
| Russell James | Manager Major Capital Projects | Jandakot |
| Russell Godsall | Senior Manager Operations | Jandakot |
| Matthew Marshall | Regional Operations Manager | Jandakot, Albany |
| Lee Deacon | GIS Team Leader | Jandakot |
| Idris Kaka | IT Manager | Jandakot |
| Luke Burns | Director of Finance and Controller | Jandakot |
| Tom Verjans | Planning Supervisor | Jandakot |
| Pat Donovan | Chief Operating Officer | Jandakot |

## 3.2 Documents Reviewed

**Table 3.2: Documents Reviewed**

| Document Title | Reference Number | Revision Date |
|---|---|---|
| Major Work Permit Form | TCO W1001 RF02 | 16/04/2013 |
| ATCO Gas Australia Emergency Exercises | TCO PL 00001 WI002 | 13/11/2013 |
| CBD Emergency Isolation | TCO PL 00001 WI004 | 03/05/2013 |
| Action Tracking Register | TCO RG0003 (RR01 formerly) | |
| AGA Employees Matrix | N/A | |
| AGA Management Report - Finance Report | Nov-13 | Dec-13 |
| AGA Strategies and Objectives 2014-2016 | N/A | 2013 |
| AGA Technical Compliance Documents | TCO RG003 | |
| Aging Asset Strategy - Unprotected steel (Internal document uncontrolled) | N/A | |
| Albany Network FSA | TCO RP0113_0 | 2013 |
| AMS Review | 401012-01595-REP 002 | 30/05/2011 |
| Asset Class Plan - Cathodic Protection Systems | AST PL00006_2 | 30/12/2013 |
| Asset Class Plan - Metering Facilities | AST PL00010_2 | 30/01/2014 |
| Asset Class Plan - Pipelines, Mains, and Services | AST PL0009_2 | 30/01/2013 |
| Asset Class Plan - Pressure Regulating Facilities | AST PL00012_2 | 24/12/2013 |
| Asset Class Plan -Telemetry Equipment | AST PL00013_2 | 30/01/2014 |
| Asset Management Plan (AA4) 2014-2019 | AST PL000018 | 18/03/2014 |
| Asset Management Plan 2010-2015 | WAGN PL 10/01_A | Jun-10 |
| Asset Management Plan 2014-2019 | AST PL00003_2 | 30/01/2013 |
| Asset Management System Strategy | WAGN-ST-001 | 16/03/2010 |
| Assets & Systems Performance & Health Monitoring Report 2013 | AST PRO0005_0 | 3/02/2014 |
| Witnessing of Accuracy Verification Tests | SWI SM 004 | 18/04/2011 |
| Routine Meter Change Business Case | 1521-2014-GCA1-SM-002 | 20/12/2013 |
| Two Rocks Business Case | 1521-2012-GCA1-SM-088 | 15/06/2012 |
| Beresford MP Mains Extension Business Case | 1521-2014-GCA1-SM-031 | 05/02/2014 |

| Document Title | Reference Number | Revision Date |
|---|---|---|
| Call Centre Work Instruction | CCT WI001_5 | 5/08/2013 |
| ATCO Gas Australia Capital Contribution Policy | COM PO00002 | 18/01/2013 |
| CAPEX Projects Works Program 2013 with Overheads | v.17 | 2013 |
| Cathodic Protection Annual Report | | 2010/11 |
| Compliance procedure | REG PRO001 | 14/02/2012 |
| Compliance Report | [HOLD] | 24/09/2013 |
| Conducting Formal safety Assessments | TCO GL0001_1 | 16/11/2011 |
| Customer Service Fault Scripting | CTR WI 002 RF01_6 | 13/03/2013 |
| Damage Prevention Management Guide | ENS GL0006_0 | 4/12/2013 |
| Day Turn Around Sheet | NCN RF05 | 07/03/2014 |
| Debrief Report | N/A | 21/05/2013 |
| December 2011 Audit of Pipeline Patrol Report | TCO RP0048_0 | 14/12/2011 |
| Design Control and Project Management Procedure | ENS PR0001_3 | 27/08/2013 |
| Planning and Maintenance | PLN WI001 | 28/06/2013 |
| Document Control Procedure | ELT PR0001 [HOLD] | 18/12/2013 |
| Drawing - PL1 HP DP | B-03-0026-01 | 2009 |
| Emergency Response Plan | TCO GD PL 0160 | (currently under review) |
| Employees Matrix Spreadsheet | | |
| Engineering Services Design Guideline Multistorey Piping | ENS GL0002_5 | 20/12/2013 |
| Engineering Services Design Guideline Pipelines | ENS PR0019_5 | 24/01/2014 |
| Environmental Training Presentation | N/A | 6/09/2013 |
| ERA Previous Review | 401012-01595 | 30/05/2011 |
| Field Operations manual | QLT PR0001 RG03a_20 | |
| Financial Statement Close Process Information | v. 2013-1 | 19/04/2011 |
| Formal Safety Assessment - Metallic Mains | TCO RP0002 | 28/12/2011 |
| Formal Safety Assessment - Pipeline Corrosion on Steel MAOP>1900Kpa | TCO RP0005_0 | 9/01/2012 |
| Gas Distribution Jandakot Communications Contingency | CCT PR0001 | 27/12/2012 |
| WAGN Gas Distribution System Safety Case | GD PL 0130_4 | 28/07/2011 |
| Gas Standards Regulations | 2000 | 2000 R.16 |
| HAZOP Report | MTN689 TCO RP0099 | 29/01/2013 |
| HP130 Two Rocks Pipeline MDR | HP130 | |
| HSE Activity Planner | N/A | 2013 |
| Information Technology Services Agreement | 210006231_1 | 1/06/2010 |
| Inlet and Outlet pressure Bunbury Skids Upgrade | 401012-00701-00-SR-REP-0006 | 13/05/2009 |
| I-Tek Service Contract | WAGN ITSA DDG JKH 09-2011-5501 | 31/07/2010 |
| Jandakot Audit Checklist | N/A | |

| Document Title | Reference Number | Revision Date |
|---|---|---|
| Kalgoorlie Workgroup Meeting Minutes | N/A | Feb-14 |
| MAOP Report - PL 1 East Perth | | Jul-05 |
| MAOP Report - PL 15 | MAOP RPT – HP15 | 2011/12 |
| MAOP Report - PL 21 | | |
| MAOP Report - PL 29 | | |
| Master Obligation Register | REG RG001 | N/A |
| Monthly KPI Report – May 2013 | MR 2011 | May-13 |
| Monthly minutes – Active Project Schedule – 2013 Projects Capital Manager | N/A | 2013 |
| Monthly report, May 2013 | NI_MR_May13_v2 | May-2013 |
| Network Asset Replacement Strategy | AST ST00001_2 | 17/08/2011 |
| Network Infrastructure Business Case Template | FIN PRO003_3 | 28/03/2013 |
| Network Infrastructure Monthly Report - | NI_MR_April13 | Apr-13 |
| Network Infrastructure Monthly Report - May 2013 | NI_MR_MAY13 | |
| Network Infrastructure Monthly Report | NI MR June 2013 | Jun-12 |
| Network Planning Guidelines | N/A | |
| Network Planning Strategy | AST ST00003_2 | 21/12/2011 |
| Operating Rogan Equipment | SWI FS 001 | 23/08/2011 |
| ORMCC Meeting Minutes | Minutes | 10/12/2013 |
| Pipe – UPVC and PE | ENS TS002 Rev.8 | 08/10/2013 |
| Pipeline Design and Selection | ENS GL 0002 | 20/12/2013 |
| PMP – Albany Galvanised Iron Replacement Programme | 2013ENS_3 | 21/08/2013 |
| PMP- MGL Pigging Project | MGL _A | 2013 |
| PMP Template | ENS PL0002 | 10/10/2013 |
| Position Description - Manager Asset Services | 50004830 | |
| Professional Memberships | HRS PR0015 | |
| Project Management Manual | ENS MA00001_0 | 6/09/2013 |
| Quick Reference Guides | Uncontrolled | N/A |
| Risk Assessment Register | - | Live |
| Risk Management Plan | RMT PL00001_6 | 16/12/2011 |
| Risk Management Policy | RMT PO00001_4 | 2/01/2014 |
| Risk Management Procedure | RMT PL00001 PR 0002_3 | 16/12/2011 |
| Risk Matrix | N/A | N/A |
| Safe Work Instruction – Attend Gas Escape | SWI GE 001 | 13/07/2011 |
| Safe Work Instruction – Decommissioning of Gas Pipes and Facilities | NOP WI029 | 16/08/2011 |
| Safe Working Instruction - Maintenance | SWI SM002_1 | 18/10/2011 |
| SAP notification (Broken SVC) | 301391346 | 6/02/2014 |
| Pipeline Start-up Sheet | ENS PR011RF06 | 29/08/2011 |
| Start-up Sheets | Various | N/A |

| Document Title | Reference Number | Revision Date |
|---|---|---|
| Technical Compliance Document Register | TCO RG0003 | |
| Technical Compliance Report | N/A | Jan-14 |
| Training Plan for Manager Asset Services | 2014 PDS | |
| Training Request Form | HRS-PR0007 RF09 | N/A |
| VV OPEX Budget | 2013 | 13/06/2013 |

## 3.3 Licensee's Response to Previous Recommendations

Tabled below are 2011 recommendations and corrective actions.

**Table 3.3: Previous Recommendations and Corrective Actions**

| Rec. #/Area | 2011 Recommendation | Review findings and ATCO corrective actions |
|---|---|---|
| # 1 Area 1.0 | It is recommended that the initiatives and studies into underlying factors contributing to UAFG, which are being discussed with Energy Safety and UAFG trends, continue to be monitored in conjunction with ESD. | Monitoring and reporting of UAFG is on a monthly basis along with a full suite of KPI's. A review meeting is held post report. This requirement is articulated in AGA's AMP.<br>This action is now closed |
| #2 Area 1.1 | As the pipeline infrastructure age is yet to reach the economic life expectancy of corrosion protection coatings, the life expectancy of 120 years applied to the currently used coatings is unproved. It is recommended that a review is conducted to confirm the validity of the asset life assumption. | The Asset Class Plans such as AST PL0009 (Steel Mains) highlights the useful life of assets.<br>AGA reviewed the economic lives used by other gas distribution utilities in Australia, and identified that the 120 years economic life for high pressure steel used by AGA is 40 years longer than the economic lives adopted by any other Australia gas distribution businesses. AGA has included a proposal to reduce the economic life of high pressure steel from 120 years to 80 years in its access arrangement submission for the access arrangement period 2014-2019.<br>AGA is also conducting ongoing review based on integrity data to valid technical life for its assets.<br>This action is now closed |
| #3 Area 2.0 | It is recommended that the engineering documents used for the design of the system, which have not been updated, are given priority and revised as soon as practicable. | Procedures have a three-year review cycle. The Engineering Services Design Guide 2010 has been reviewed, and AGA are transitioning to the use of the new Project Management Manual, which is PMBok focussed with a 3 year review cycle. This will be an ongoing process and adequate focus has been applied.<br>This action is now closed |

| Rec. #/Area | 2011 Recommendation | Review findings and ATCO corrective actions |
|---|---|---|
| # 4 Area 2.1 | It is recommended that engineering services staff are afforded the opportunity to attend professional development training or information sessions to remain abreast of current trends or emerging practices within the area of gas network infrastructure and gas distribution. | Each employee and their area manager identify training needs. External training requires executive manager approval with an external training & development request form being utilised.<br>This action is now closed. |
| # 5 Area 5.0 | It is recommended that the WA Gas Networks Environmental Advisor periodically attends the regional depots to provide presentations of the environmental information typically provided in the Safety Focus meetings and Envirograms within the metropolitan area. | Evidence shows that the regional depots are visited on at least 3 monthly basis and more frequent as required, with corporate information presented. The environmental team rotates to achieve diversity.<br>This action is now closed |
| # 6 Area 6.0 | It is recommended that the WA Gas Networks carry out a risk assessment to consider if an increased frequency of patrols in areas where the signs are damaged often is required. | Discussions identified a risk assessment of pipeline patrols was not conducted, however an audit of PL patrol efficiency was undertaken. Two improvements and one corrective action were identified. Further recommendations have been made.<br>This action is now closed |
| #7 Area 6.1 | It is recommended that the WAGN reviews its current approach to inspection of crossings to ensure alignment with AS2885.3, creation of firebreaks where necessary, and reviews current protection of facilities against falling trees and vehicles. | The design guidelines refer to Fencing, signage and security to prevent third party interference however; there is no document linkage referenced in the design documentation.<br>This action is still open. |
| #8 Area 6.2 | It is recommended that intelligent pigging of the Class 600 pipelines be considered by WA Gas Networks. | Consideration and assessment of pigging Class 600 pipelines was given and the risk assessment found pigging to be warranted however, the 2012 assessment has not been finalised, nor a close out report issued. The first section of pigging (of the oldest pipes) is underway.<br>This action is now closed |
| # 9 Area 7.0 | It is recommended that a procedure is developed for the verification of formulas within spreadsheets used by Engineering Services. | Calculations are locked down preventing any changes. Engineering Manager is custodian of calculation area on the server. Third party validation of calculations is underway.<br>It is recommended that a methodology of introducing new calculations as well as an overall procedure be developed.<br>This action is still open. |

| Rec. #/Area | 2011 Recommendation | Review findings and ATCO corrective actions |
|---|---|---|
| # 10 Area 7.1 | It is recommended that all engineering spreadsheets are retained on the server in accordance with the company policies. | All engineering spreadsheets are accessible in a locked down area.<br>This action is now closed |
| # 11 Area 8.0 | It is recommended that the WA Gas Networks develop an action management procedure that clearly outlines the responsibilities of various parties. | In 2011, action management was incorporated into the guide to conducting FSA. However, as a result of organisation changes, a review of the documented guideline required in the area of action management. .<br>This action is still open. |
| # 12 Area 8.1 | It is recommended that all actions raised on WAGN during external risk assessments are stored in the Action register. WA Gas Networks should request the final copy of the 3rd party (e.g. developers) FSA reports to ensure that they are aware of the 3rd party responsibilities (in case there is a dispute later on). | Actions from 3rd parties are registered and have been closed out. Copies of the reports are linked to the register.<br>Action is now closed |
| # 13 Area 8.2 | It is recommended that all risk management documentation contains the current approved risk matrix. | Current matrix is available on intranet. It is recommended to not include this in various documents to avoid outdated versions embedded in documents.<br>This action is now closed. |
| # 14 Area 8.3 | It is recommended that WA Gas Networks finalises 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. | Engineering Services Design Guidelines Valves is not on server and missing link out of PMM (document number appears to be adopted from another document?)<br>This action is still open |
| # 15 Area 8.4 | It is recommended that WA Gas Networks finalises 'Guidance of Gas Distribution formal Safety Assessments'. Where information has not been finalised HOLD's can be used to alert the reader to contact Technical Compliance for latest advice rather than leaving highlighted, unfinished sections. | All information has been finalised & Rev1 issued.<br>This action is now closed. |
| # 16 Area 8.5 | It is recommended that WA Gas Networks finalises the Formal Safety assessment and HAZOP reports shortly after workshops and do not leave unfinished ambiguous sections of the document. | Reports are generally closed out and forwarded to project managers (particularly for construction)<br>This action is now closed |

| Rec. #/Area | 2011 Recommendation | Review findings and ATCO corrective actions |
|---|---|---|
| # 17 Area 8.6 | It is recommended that a full HAZOP/HAZID is replaced with a workshop template that captures all the pertinent information for each workshop: study team, scope, objectives and exclusions. Reference can be made to guidance documents that detail how to conduct each workshop and only deviations from the standard methodologies are noted o the template. The worksheets with all the relevant information can be published. | Some elements are covered in the guide to conducting FSA's, however there is no detail on method of conducting and recording, template to use, issue of terms of reference etc.<br>AGA will revise the guide on conducting FSA to include terms of reference of FSA, process for recording actions; allocating responsibilities and managing action close out.<br>This action is still open. |
| # 18 Area 9.0 | It is recommended that the close out actions from exercises and real emergencies that are included in the action tracking register be examined regularly by WA Gas Networks management to ensure close out dates are not overdue. | Actions are tracked monthly and reported<br>This action is now closed |
| # 19 Area 9.1 | It is recommended that WA Gas Networks provides written evidence of close out of actions. In case is has been decided that the recommended action should not be implemented documented justification should be prepared, including risk assessment. | Descriptions in Action register and status close out date.<br>This action is now closed |
| # 20 Area 9.2 | It is recommended that the issues mentioned in recommendations 18 and 19 have KPI's allocated. | Outstanding actions are in the monthly report. Cumulative actions tracked in tabular form in monthly report.<br>This action is now closed. |
| # 21 Area 9.3 | It is recommended that the 5 year Emergency Exercise Plan be updated to include information regarding details of previous exercises. | Lessons learned are captured in action register.<br>This action is now closed. |

## 3.4 Asset Management Review Effectiveness Summary

Table 3.4 summarises the auditors assessment of both the process and policy definition rating and the performance rating for each key process in AMS using scales described in Table 5 and 6 (11.4.2 of Audit Guidelines).

**Table 3.4: AMS Review Effectiveness Summary**

| Process Area | AMS Process & Policy Definition Adequacy Rating | AMS Performance Rating |
|---|---|---|
| 1. Asset Planning | A | 1 |
| 2. Asset creation and acquisition | B | 2 |
| 3. Asset disposal | A | 2 |

| Process Area | AMS Process & Policy Definition Adequacy Rating | AMS Performance Rating |
|---|---|---|
| 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 |

## 3.5 Review and Observation

Collation of interviews, documents and observations are detailed herein on the effectiveness of AGA's Asset Management System.

### 3.5.1 Area 1 - Asset Planning

Effectiveness Rating: A-1

#### 3.5.1.1 Key Process

Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).

#### 3.5.1.2 Summary

AGA follows a sound and formal asset planning process, which is informed by contractual (customer), legislative and corporate objectives. The processes and planning strategies are adequate for their intended purpose.

#### 3.5.1.3 Review Trails and Sources of Evidence

**Documents**

- AMP (AST PL00005) – (note 2 versions exist ERA and AGA).
- Investigation report on sources of UAFG.
- Fugitive emissions tracked through SAP and reported in monthly report.
- Consultant conducted benchmarking for economic life.
- Asset Class Plan (AST PL0009).
- Aging Asset Strategy – Unprotected steel (Internal document uncontrolled).
- Network Planning Strategy (AST 00003).
- Document Control Procedure (ELT PR0001).
- Signed business case 1521-2014-GCA1-SM-002.
- Assets and Systems Performance and Health Monitoring Report 2013 Appendix B.

- Gas Standards Regulations 2000 R.16.
- Compliance procedure REG PRO001.

#### 3.5.1.4 Discussion

AGA has made a gradual transition from the preceding WAGN procedures and revamped its systems to incorporate the ATCO corporate influence. A key strategic objective is for AGA to grow throughput.

Network planning is underpinned by an Asset Management Plan, which is developed each year and focuses, among other things, on reinforcement and expansion plans for the Gas Distribution System. The plan underpins the preparation of the five-year Business Plan and Budget cycle, approved each year by the Board.

Asset Class Plans summarise annual costs and highlight useful life of assets such as steel mains, and metering facilities. Development of the Asset Class Plans allows AGA to move toward an asset management methodology in line with the ISO 55000 series of standards.

The planning process is well informed by information streams such as non-conformances. Business cases, which highlight risk and regulatory criteria, generate projects within the AMP, OPEX and CAPEX.

A major effort has been focused on the Albany network with UAFG reduced from 22% to 10% from leak repairs.

#### 3.5.1.5 Recommendations

1.1 Extend the inclusion of actual integrity data to assess useful asset life in other Asset Class Plans, similar to the Asset class plan for pipelines, mains and services.

1.2 Formalise within Asset Class Plans strategy for dealing with Aging Asset.

### 3.5.2 Area 2 - Asset Creation and Acquisition

Effectiveness Rating: B-2

#### 3.5.2.1 Key Process

Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.

#### 3.5.2.2 Summary

AGA has reviewed its procedures and is currently transitioning to a new structure of managing its asset creation. Both the old Design Guide and the new Project Management Manual are being used in parallel. The Project Management Manual is intended to follow the established PMBok principals. Both processes are sound, but the transition requires completion for clarity of responsibility and process to be used.

#### 3.5.2.3 Review Trails and Sources of Evidence

**Documents**

- Project Management Manual EMS MA00001_0 /09/2013
- Design Control and Project Management Procedure ENS PR0001_1
- Engineering Services Design Guide
- Pipe – UPVC and PE ENS TS002 Rev. 8
- Albany Galvanised Iron Replacement Programme 2013 PMP ENS_3
- AGA Technical Compliance Documents TCO RG0003
- Position Number 50004830 Manager Asset Services
- Professional Memberships HRS PR0015
- Training records for Manager Asset Services in SAP
- Training plan for Manager Asset Services (2014 PDS)
- Training request form (HRS-PR0007 RF09)
- Certificate of Designation for Gas Inspector (H. Coyle) in SAP
- G Class Gas Fitter Licence (GF15107) Patrick During also in Employees Matrix Spreadsheet
- Business Case 1521-2012-GGA1-SN-088
- Business Case 1521-2014-GCA1-SM-031
- Template FIN PRO 003
- AS 4645/AS 2885
- HP130 Two Rocks Pipeline MDR
- TC0 W1001 RF02
- Master Obligation Register – on EIM (shared folder)

#### 3.5.2.4 Discussion

The Project Management Plan 2013 *Albany Galvanised Iron Replacement* Rev.3 has referenced specifications (i.e. UPVC and PE), yet it appears similar documents such as the Project Management Manual (PMM; newly developed) and the Design guidelines or Design Control and Project Management Procedure (outdated documents) are being used in parallel prompting the need to implement one of these. The auditors acknowledge documents are being phased out and new manuals trialled, however, this is manually managed by senior staff rather than a document controlled process.

Project Management Pack (scope) defines commissioning documentation requirements. Larger projects have commissioning plans; smaller projects are handled under the Permit To Work system. An AS2885 independent validation is conducted for pipelines designed to that standard.

Ongoing legal, environmental and safety obligations on asset acquisition are met at a - Corporate level; Compliance Obligations Register, which assigns ownership of Acts and Regulations i.e. GSR owned by Chief Operating Officer, Reg. 15 of Gas standards – Meter Replacement by Asset Services Manager.

#### 3.5.2.5 Recommendations

2.1 Improve document numbering as several instances of missing and number duplications have been noted. I.e. The design Guidelines – Pipelines (ENS PR0019) has document numbering missing in appendix 1 (Guidelines on Gas Distribution FSA), Document number missing from Business case etc.

2.2 Implement process to ensure all significant project documents for new projects are scanned and published in DMS.

### 3.5.3 Area 3 - Asset Disposal

Effectiveness Rating: A-2

#### 3.5.3.1 Key Process

Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, underperforming or unserviceable assets. Alternatives are evaluated in cost-benefit terms.

#### 3.5.3.2 Summary

The Asset Management Policy informs AGA's Network Asset Replacement Strategy. The assets are managed to minimise the whole of life asset cost while managing risks to as low as reasonably practicable (ALARP) for various classes of assets (Asset Class Plans).

#### 3.5.3.3 Review Trails and Sources of Evidence

**Documents**

- Asset & System Performance & Health Monitoring Report 2013 (AST PR0005).
- Start-up sheets.
- Safe Work Instruction – Decommissioning of Gas Pipes and Facilities (NOP WI029 and SWI MA003).
- Network Asset Replacement Strategy AST ST00001.

#### 3.5.3.4 Discussion

Core business is being identified and performance criteria documented such as AST PR0005, which documents physical leaks per kilometre as the performance criteria. Should the leak rate be above network average then pipeline is prioritised for remedial action.

A review of procedures and work instruction showed that the overall systematic approach is effective for their intended purpose. However linkages to areas such as drafting, asset services etc. could be further improved for example by way of checklist to cross check completion of actions.

#### 3.5.3.5 Recommendations

3.1 Procedure needs to incorporate close out requirements and parties to be informed (e.g. drafting, asset services etc.).

### 3.5.4 Area 4 - Environmental Analysis

Effectiveness Rating: A-2

#### 3.5.4.1 Key Process

Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.

#### 3.5.4.2 Summary

AGA has a sound understanding of its operational environment in Australia and in particular Western Australia. Corporate processes ensure effective rigour is applied regionally. Business and legislative drivers are understood. The local Risk and Compliance Committee ensures all identified obligations are met and reviewed.

#### 3.5.4.3 Review Trails and Sources of Evidence

**Documents**

- Asset Management Plan 2014-2019 (AST PL00003_2 30/01/2013).
- Asset Management Plan (AST PL00005).
- Asset Class Plan.
- Network Planning Guidelines.
- Monthly KPI report May 2013.
- Compliance procedure REG PRO001.

#### 3.5.4.4 Discussion

External influences on assets are assessed in the AMP using industry-accepted Porter's Five Forces methodology . The AMP lays out a concise demand analysis so it can meet current as well as future demand taking into consideration the lifecycle of the assets.

Business development is the lead indicator for forecasting and predicting network growth.

A formal SWOT analysis, inclusive of regulatory, is absent from the AMP. A corporate risk register exists but needs to be referenced into the business plan and linked to the AMP.

The AMP incorporates conditions stipulated in AS/NZS 4645.1 such as failures affecting >25,000 customers on critical High Pressure Regulators. Direct projects to mitigate such events have been proposed (six additional gate stations). Customer surveys are also highlighted in the AMP.

AGA has procedure and process in place to control reference/template documents, such as policies, procedures, guidelines, plan, forms…etc. While in general controlled documents are appropriately managed, some of the controlled documents and also uncontrolled documents, such as reports, did not include document date and/or revision number, and used duplicate document numbers.

Master obligation register utilises the ERA categorisation ("obligation type"). Access controlled via IT. Compliance procedure REG PRO001 outlines update process to register. Each QTR Risk Compliance committee meeting held raises changes to obligation register.

#### 3.5.4.5 Recommendations

4.1 Reference corporate risk register into business plan and link to the AMP.

4.2 Develop process to ensure all reference/template documents are controlled, and key non-controlled documents contain sufficient identification and revision information.

### 3.5.5 Area 5 - Asset Operations

Effectiveness Rating: A-1

#### 3.5.5.1 Key Process

Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.

#### 3.5.5.2 Summary

Operational policies and procedures are documented and safety assessments are utilised to risk manage and prioritise operations task. KPI's are formalised and circulated among staff. Various IT infrastructures are being utilised to underpin general operations and are understood and functioning satisfactorily.

#### 3.5.5.3 Review Trails and Sources of Evidence

**Documents**

- Attend Gas Escape SWI GE 0001.
- FSA.
- Operating Rogan Equipment Rev 2 23/08/2011.
- WAGN Gas Distribution System Safety Case (GD PL 0130_4).
- Asset Class Plan - Pipelines, Mains & Services (AST PL00009_2 30/01/2013).
- Call Centre Work Instruction CCT WI001_5 5/08/2013.
- Monthly report, May 2013 (NI_MR_May12_v2).
- Customer Service Fault Scripting (CTR WI 002 RF01_6 13/03/2013.
- Field Operations manual QLT PR0001 RG03a_20.
- Safety Case.
- Safe Working Instruction SWI FS 001_2.
- Albany Network FSA (TCO RP0113_0 2013).
- Action Tracking Register.
- SAP.
- Monthly report.

- AMP – Access arrangements.
- VV Opex Budget 13.6.13.
- Finance Report.
- ATCO Management Report Dec 2013.
- AGA Employees Matrix.
- Environmental Training Presentation 6/9/13 (Conducted at Kalgoorlie).
- Kalgoorlie workgroup meeting minutes 02/2014.
- HSE Activity Planner 2013.
- Network Infrastructure Monthly Report 04/2013.

#### 3.5.5.4 Discussion

Monthly KPI's are listed in the AMP and accepted by the regulator. On review of the ACP *Pressure Regulating Facilities* and *Metering Facilities*, both state, "Currently there are no new targets for the level of service". Work has commenced on moving towards an integrated approach to asset, health, safety and quality management and as part of this improvement, asset management system KPIs will be updated to closer reflect those suggested in AS4645.1.

Interviews reflect that senior staff are aware of their KPI's, and annual trending of HSEQ management review performance is 95% compliant.

Planning and Control Room run monthly KPI reports of attendance to Customer Service Standards against KPI, and reviewed by Senior Managers (Network Infrastructure), and the CEO.

There is a satisfactory correlation between Asset Management Plan and the Operational Plans (Asset Class Plans) to achieve stated service levels.

Risk assessments are conducted and actions logged in the action tracking and corporate risk register. Interview and documents review identified discussions in which Energy Safety assist in the prioritisation of actions, such as leak surveys and replacement of mains. However, SAP does not automatically schedule some leak survey activities. These leak surveys are scheduled in a spreadsheet that is stored in EIM (manually), which is being changed over now. The spreadsheet is manually tracked; in future, this will be automated when the activities have been added to SAP.

Review and tracking of costs is on a monthly basis against the allocated budget for the year in similar fashion as capital projects (cost variance).

Operations KPIs assess the following criteria:

- Capital works (new growth).
- Reactive maintenance (safety) (mains –km's).
- Third party damage prevention.
- Public and network safety.

#### 3.5.5.5 Recommendations

5.1 Link SAP asset number, drawing numbers and referenced documents.

### 3.5.6 Area 6 - Asset Maintenance

Effectiveness Rating: B-2

#### 3.5.6.1 Key Process:

Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.

#### 3.5.6.2 Summary

Review of three recommendations from the previous audit found further enhancements could be made to the AGA system inspections and patrols. Application and completion of risk assessments to inspection regimes is recommended.

Asset maintenance plans are documented in SAP, and execution is tracked monthly. Area Supervisors schedule maintenance via planning teams to ensure maintenance is carried out. The Asset Management team is transitioning into risk based modelling to drive maintenance of assets.

#### 3.5.6.3 Review Trails and Sources of Evidence:

**Documents**

- Damage Prevention Management Guide ENS GL0006_0 4/12/2013.
- Project Management Plan Template ENS PL0002 10/10/2013.
- MAOP's and ACP for High Pressure Steel Pipelines.
- PL 21 Patrol Report TCO RP0048 Rev. 0 14/12/2011 – no name or signatures.
- PL1 HP DP Drawing B-03-0026-01.
- Total MAOP Document (uncontrolled document).
- PL 1 MAOP Report 2009.
- 2009 Class location Review.
- PL 15 MAOP Report 2011/12 – MAOP RPT – HP15.
- Cathodic Protection Performance Workflow (uncontrolled as being tested at the moment).
- Annual Report 2010/11.

#### 3.5.6.4 Discussion

Discussions identified a risk assessment of pipeline patrols was not conducted as per previous recommendation # 6, however an audit was undertaken. Pipeline patrol level is not linked to FSA, rather, company historical data and ACP. Considering recent urban development, auditors suggest a review of pipelines to determine relevance to today's class, activity and subsequent patrol level, and later, effectiveness of patrols. Attention was given to pigging of Class 600 pipelines and the risk assessment found pigging to be warranted. A FSA of pipeline corrosion on steel pipelines with MAOP greater than 1900kPa has been conducted and RMAP's raised, however the document is not finalised with the risk assessment, and associated actions still open on the Tracking Register. The excel spreadsheet for cost control, the business case and associated approval was difficult to find. Although pigging was found to be warranted, and the first section underway, closure of the oldest lateral, East Perth pigging on the Action Tracking Register was not evident. ATCO will risk assess the

need for more intelligent pigging. It is noted that reviewed version of associated document, *Project Management Plan – 2013 Facilitate intelligent pigging capability (launches & receivers)-MGL Pigging Project Rev. A.* needs to be 'signed off' and saved onto a shared drive.

The Asset Class Plan specifies reactive and periodic maintenance, service levels and the customer, however does not outline preventative maintenance. Maintenance intervals are determined by the Assets & Systems Performance & Health Monitoring Report 2013 and self-assessment reports. This is working well with a relatively good ratio of (planned and unplanned) maintenance activities.

Regular inspections are undertaken of asset performance and condition and assets analysed for performance and condition. FMEA's are carried out on asset class, although history still drives frequency of maintenance work. In addition to building RCM models to change frequency with quantitative models, ATCO are in the process of building the FMEAs to drive maintenance intervals. Decisions to set appropriate maintenance options are risk based i.e. prevent, predict and run to fail.

Maintenance plans are documented in SAP and tracked on a monthly report. Asset condition monitoring is not yet complete. Faults response is based on public calls. KPI's are based on site call out and prioritisation. SAP scheduled work is re-scheduled as required via supervisor and planning team.

#### 3.5.6.5 Recommendations:

6.1 Recommend formalising a location class review to support current interval of pipeline patrols and determine relevance to today's class, activity and subsequent patrol level (considering urban development). Assess location specific risk, current activity and density to pipes. Found Class 600 pipes, rural that were traditionally R1, however the Metro area expanding now encompasses some of these pipelines.

6.2 Recommend thorough integration and referencing of strategic documents such as Damage Prevention Guidelines into Project Management Manual, Plans and templates. Additionally, blank document numbers referenced in PMPs to be crosschecked for correctness.

### 3.5.7 Area 7 - Asset Management Information System

Effectiveness Rating: B-2

#### 3.5.7.1 Key Process

An asset management information system is a combination of processes, data and software that support the asset management functions.

#### 3.5.7.2 Summary

The Asset Management Information System (AMIS) draws on a number of sub-systems that share information to various degrees. SAP remains the primary system. Areas of the intranet utilised for AMIS functions are adequately secure and off-site disaster recovery and management outsourced.

#### 3.5.7.3 Review Trails and Sources of Evidence

**Documents**

- Asset Management Plan.
- SAP.

- ACP.
- Document Control Plan (PLN WI001).
- Start-up sheet example template (ENS PR0011RF06).
- Day turn around sheet example (NCN RF05).
- I-Tek IT Service Agreement (WAGN ITSA DDG JKH 09-2011-5501).
- Compliance Report 24/09/2013.
- Master Obligation Register (no reference number).

#### 3.5.7.4 Discussion

Asset services implement tasks from AMP and ACP's into SAP however, this is limited to tasks and not materials. Planning team has a suite of user instructions in document control PLN WI001.

For new assets, Start-Up Sheets are used and are reviewed by an Asset Services Engineer for data integrity. Transfer of data is currently transferred into SAP manually.

Routine maintenance is carried out on work orders using daily turn-around sheets for each department (e.g. customer service, planning, maintenance etc.). The department's supervisor reviews the turnaround sheets prior to information re-entered into SAP. AGA is currently implementing the initiative "field mobility" using electronic tablets given to the technicians for automatic data transfer from field to AMIS.

While each area has its own procedure/process, it was noted that there is no overall work execution procedure covering maintenance activities end to end.

Articulation of IT security is in the IT policy and code of conduct, with general passwords expiring every 30 days. The document control department have exclusive access to the library of master documents. Currently there is no physical access control during business hours (go through reception). Out of business hours, the office is control locked and manned 24-hours with security guard (7pm to 6am). The new building will have full swipe card access.

Outsourcing of IT is to ATCO I-Tek, who is responsible for disaster recovery hardware and software. The IT disaster recovery plan was not available but, contract with I-Tek was sighted (WAGN ITSA DDG JKH 09-2011-5501).

Engineering calculations are located on the intranet, which are all password protected until validation. Calculations are locked down and the Engineering Manager must approve any changes.

#### 3.5.7.5 Recommendations

7.1 Develop an overall work execution procedure covering maintenance activities from end to end.

7.2 Consideration for making the Call Centre Quick Reference Guide a formal procedure.

### 3.5.8 Area 8 - Risk Management

Effectiveness Rating: C-2

#### 3.5.8.1 Key Process

Risk Management involved the identification of risks and their management within an acceptable level of risk.

#### 3.5.8.2 Summary

AGA is a risk aware company with numerous changes and procedures driven by the parent company. AGA is in the process of upgrading and combining its risk management framework for its Australian operations and subsequently some areas of risk management have progressed or received significantly more effort.

#### 3.5.8.3 Review Trails and Sources of Evidence

**Documents**

- Risk Management Policy (RMT PO00001_4, 2/01/2013).
- Risk Management Plan (RMT PL00001_6, 16/12/2011).
- Risk Management Procedure (RMT PL00001 PR 0002_3, 16/12/2011).
- Gas Distribution Safety Case (28/07/2011).
- Conduction Formal Safety Assessments (TCO GL0001_1, 16/11/2011).
- Action Tracking Register (TCO RG0003, formerly RR01).
- HAZOP Report (MTN 689 TCO RP0099, 29/01/2013).
- Engineering Services Design Guideline – Multistorey Piping (ENS GL0002_5, 20/12/2013).
- Engineering Services Design Guideline – Pipelines (ENS PR0019_5, 24/01/2014).
- Formal Safety Assessment (TCO RP0002).
- ACP (AST PL 00009, 30/01/2013).
- AMP.
- ORMCC Meeting Minutes (10/12/2013).
- Technical Compliance Document Register (TCO RG003).
- Inlet and Outlet pressure Bunbury Skids Upgrade.

#### 3.5.8.4 Discussion

AGA embeds risk management at all levels of the business with corporate risks assessment conducted at the management level, FSA on network design, construction, commissioning, operations and maintenance, risk assessments on business cases and projects, and pre-task hazard assessments in the form of a Take-5 prior to commencing field activities.

Support for the above risk management activities is provided by the following business units –

- Risk and Compliance – conducts corporate risks assessments, and risk assessments on business cases and projects.
- Technical Compliance – conducts FSA.
- HSE – manage pre-task hazard assessments, and conducts environmental, health and safety risk assessments.

The Risk Management Policy, Plan and associated procedures were evidenced. Section 2.1 of the Risk Management Plan requires the plan to be reviewed at least annually, and it was noted that there was no record of an annual review conducted in 2012. AGA advised that a review of the plan was conducted in 2012, but no changes were recommended and no update was made to the document's revision date.

High-level risk responsibilities and positions in regards to the risk and compliance committees and reporting operate sufficiently. While the Risk Management Plan and Risk Management Procedure cover the different level of risk management, a concise matrix that formalise the organisation (position & title) responsibility for risk management is not available. Formalising organisational responsibilities for risk measures ensures any risk reduction measures identified during workshops are only assigned to the responsible person for resolution and closeout. Implementation of risk reduction measures where practicable will assist with the demonstration of ALARP. Where organisational changes have occurred with changes to assigned responsibilities, these changes should be reflected in the GDS Safety Case or referenced documents (the auditors note a GDS Safety Case audit has been conducted and a revision is underway).

As a commitment to AGA's Risk Management Policy and continual improvement, it is suggested an area or policy specific internal audit is conducted within a year of rolling out or updating procedures.

The risk matrix used is based on AS 2885 and AS/NZS 4645. Actions on register are review quarterly and minuted (e.g. ORMCC Minutes 27/09/13).

The Action Tracking Register is an Excel-based spreadsheet. Communication of controls and close out are in the monthly report.

The guide to Conducting Formal Safety Assessments states HAZOP and AS2885 reports will be completed within 2 weeks of workshop, however the sighted evidence indicates this is not being achieved. Interviews revealed that from 2011 to 2013 a large number of Formal Safety Assessments were conducted and in excess of 600 Risk Management Action Plans (RMAP's) generated to reduce risk to ALARP. With the available technical risk and safety personnel facilitating Formal Safety Assessments and availability of engineering and operational personnel workshop participants the finalisation of RMAP's within a 2 week period was often not achievable and therefore the finalisation of the reports. Resource constraints also meant Formal Safety Assessment reports were not consistently prepared and to overcome this shortfall, Formal Safety Assessment workshop minutes were embedded into project folders and a document register; and RMAPs were documented in the action tracking register and monitored monthly to closeout. In addition, it was not always practicable for all responsible personnel to participate in Formal Safety Assessment workshops, requiring additional meetings to be organised to review RMAPs and the associated risks to assess the validity of RMAPs in reducing risk to ALARP. Establishing further resources for more ready participation in Formal Safety Assessment workshops, ensuring relevance of the documented risks and risk reduction actions, or RMAPs in the context of assessing whether or not the current risk is ALARP may assist the curtailment and management of current and future RMAPS.

Audits, Safety Assessments, internal HSEQ are currently on different risk registers. ATCO are in phase 1 of the implementation into SAP of three HSE registers and Risk Modules.

The process of closing out RMAPs within the action tracking register (TCO RG0003 Technical Compliance Document Register) is inconsistent. For example an old May 2009 Formal Safety Assessment of the Bunbury Pressure Reduction Skids has no closeout report or commentary to provide evidence of closeout of the RMAPs. From 2011, RMAPs closeout is inconsistent in that RMAPs are either closed out with a closeout statement within the action tracking register, or in addition to the closeout statement there is a closeout evidence folder with documentary evidence of the actions to justify closeout of the RMAP. Where Formal Safety Assessments are embedded within project folders, communication and closure of RMAPs appears inconsistent. Whilst there is evidence of regular monthly monitoring of RMAPs to closeout, regular reviews of the closeout evidence and reporting is inconsistent.

A review of multiple Engineering Services Design Guidelines, reveals incorrect document references and version control.

#### 3.5.8.5 Recommendation

8.1 Review document control procedure to ensure document history captures record of review even if no changes were made to the document.

8.2 Formalise organisation (Position & title) responsibilities for risk management.

8.3 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.

8.4 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.

8.5 All blank document numbers in PMM to be cross checked.

8.6 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.

8.7 Design guidelines references ENS GL0002 as Pipeline Design and Selection and not Engineering Services Design Guideline – Multi-storey Piping-5 ENS GL 0002.

8.8 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).

8.9 Recommend referencing FSA in Design guidelines.

8.10 To improve standardisation and traceability of risk assessments, create a 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 communication; residual risk assessment during Formal Safety Assessments; reporting (inclusive of risk matrix used); and RMAP closeout process.

8.11 Implement re-assessment of ‘high’ and ‘extreme’ current risk RMAPs, post RMAP closeout to demonstrate residual risk is ALARP.

### 3.5.9 Area 9 - Contingency Planning

Effectiveness Rating: B-1

#### 3.5.9.1 Key Process

Contingency Plans document the steps to deal with the unexpected failure of an asset.

#### 3.5.9.2 Review Trails and Sources of Evidence

- Technical Compliance Document Register.
- Technical Compliance Monthly Report, 01/2013.
- Emergency Response Plan (TCO GD PL 0160, currently under review).
- AMS Audit 2011.
- Monthly Report.
- TCO PL 00001 WI004.
- TCO PL 00001 WI002.
- Debrief Report, 21/05/2013.
- Gas Distribution Jandakot Communications Contingency (CLT PR001).

#### 3.5.9.3 Summary

The emergency response management plan is currently under review and has not been transitioned into an AGA document. The current plan is being executed and its, procedure and work instructions adequately function to ensure AGA has a solid contingency and response in case of asset failures.

#### 3.5.9.4 Discussion

AGA now have a six-year ERP schedule, as five yearly was not feasible. Capturing of the lessons learned is in the action register.

An example action item to update a work instruction revealed the isolation record sheet had been added to work instruction (TCO PL 00001 WI 004). Description included in action register and status/close out date. Revision and issue dates did not match on TCO PL 00001 WI 004. Contingency testing of communications failure/high influx conducted monthly. Actions are highlighted in the monthly report, with a cumulative action table presented.

#### 3.5.9.5 Recommendations

9.1 Remove Plan from Work Instruction and incorporate into separate document.

9.1 Update working within WI002 to refer to correct action-tracking register.

### 3.5.10 Area 10 - Financial Planning

Effectiveness Rating: A-1

#### 3.5.10.1 Key Process

The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability of the long term.

#### 3.5.10.2 Review Trails and Sources of Evidence

- AGA Strategies and Objectives 2014 – 2016 (issued 2013).
- AGA Management Report (12/2013).

#### 3.5.10.3 Summary

The financial planning, largely, is influenced by the networks access arrangement. ATCO corporate has set out a strategy for sustainable growth and long-term investment for its Australian operation. This is heavily evidenced by both CAPEX and OPEX availability.

#### 3.5.10.4 Discussion

AGA's internal business plan model is set to a five-year forecast, which is derived from AGA's Corporate Finance Model of up to 20 years.

The Annual business plan is tracked to monthly targets, with monthly issues and performance issues compared against budget. The AGA Management Report includes profit and loss, billing, and YTD totals.

Business strategy & objectives (look forward) and requirements (required KPIs) are tied to Business Plan, which drives Financial Planning.

#### 3.5.10.5 Recommendations

- Nil

### 3.5.11 Area 11 - Capital Expenditure Planning

Effectiveness Rating: A-1

#### 3.5.11.1 Key Process

The capital expenditure 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. Since capital investments tend to be large and irregular, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates.

#### 3.5.11.2 Review Trails and Sources of Evidence

- AMP 2010-2015 (WAGN PL 10/01_1, 06/2010).
- CAPEX Projects Works Program 2013 v.17 with Overheads.
- Microsoft Office Program.
- Monthly meeting.
- Network Infrastructure Business Case Template (FIN PR0003_3, 28/03/2013).
- CAPEX Policy.
- Project Management Manual (ENS MA00001_0, 6/09/2013).
- SAP report.

- Monthly minutes – Active Project Schedule 2013 Projects Major Capital Manager.
- Network Infrastructure Monthly Report (NI MR June 2012).

#### 3.5.11.3 Summary

AGA has set out a strategy for sustainable growth and long-term investment for its Australian operation. This is demonstrated by both CAPEX and OPEX availability. Its' financial and capital expenditure planning is a very organised and functioning process, which is evidenced in every aspect that was audited.

#### 3.5.11.4 Discussion

The AMP is inclusive of program of works and CAPEX. In addition to improvements or reinforcement of existing networks, drivers for growth are assessed in the annual business plan. New demand is profiled in relation to the seasonal peaks and troughs and macro-economic factors forecast housing growth, which equates to demand growth. Network modelling analysis is then performed to assess the existing assets' capabilities to cope with new demands. In this process, it will be determined whether the existing networks and facilities will require reinforcement/upgrade or new connections are required. These 'new' connections form the basis for future demands. The forecast is projected up to the next five years.

In addition to new demands, CAPEX allocations are made for maintenance and replacement strategy. This is performed by condition monitoring as part of its maintenance program and regulatory requirements such as meter replacements.

The Annual Business Plan (forecasted to three-year horizon) is used to align with every AMP revision that forecasts to a five-year period and a longer-term 20-year forecast.

Responsibilities are assigned to the most suited project managers in works programs. Updates by responsible persons are given on a monthly basis where stakeholders also attend for transparency and remediate any issues encountered. Capacity to deliver is also considered in the combined project schedule. External contractors will be engaged if there is a lack of resources or expertise as required.

Projects are tracked by key measures such as project spend and total business plan spend and year-end budget.

The CEARs (Capex Approval Request) is the approval process adopted as gates for annual allocations to a particular project. Multiple CEARs will be required for projects with life over one year and the budget is reviewed annually. Minor projects use a CEAR and have a life of two years. If the Project extends beyond two years, one case will cover. Life of business case becomes outdated when longer than business plan or intent, and the Business Case is updated.

The annual Business plan is developed with the AMP, which is rolled up, with the final version rolled down for implementation. Business case covers asset class – risks, options, regulatory tests, total cost MVP if growth. Overarching approvals process in organisation is Business Case

Minor projects less than $100,000 do not require a business case, but need a CEAR. ATCO has a procedure that details the approval process for project execution. Flowchart on the requirements for CEARs is enclosed within that document.

Recoverable third party projects are financially set up that the customer pays 'as cost' for dedicated supply. If AGA chooses to invest for more capacity, the additional capital required will be funded by AGA. These Customer Contributions do not form part of the regulated asset.

Time based replacement strategies are documented in new ACPs. For example, Meters are replaced as outlined in ACP to demand, network safety and asset life cycle.

SAP report gives every meter an installation date, which is then exported into a spreadsheet and the replacement year is projected to 25 years from the install date for long-term planning and replacement strategy for meters.

#### 3.5.11.5 Recommendations

- Nil.

### 3.5.12 Area 12 – Review of AMS

Effectiveness Rating: B-2

#### 3.5.12.1 Key Process

The Asset Management System is regularly reviewed and updated.

#### 3.5.12.2 Review Trails and Sources of Evidence

- Asset Management System (WAGN-ST-001).
- ERA Previous review.
- Audit Plan 2014.
- Jandakot Audit Checklist.

#### 3.5.12.3 Summary

AGA's Asset Management System is comprehensive and integrated in all aspects for managing its assets. This has yielded expected outcomes, on a continual basis, for all stakeholders concerned.

#### 3.5.12.4 Discussion

AMS strategy currently has no custodian and is uncontrolled. The AMS strategy is currently under review and is intended to align with the requirements defined in ISO 55001. The new strategy will become part of the AGA document management system with all of the relevant changes, caused by AGA's improvement efforts reflected. The current strategy is still valid and its philosophy reflected in most of the audited areas, such as KPIs, etc.

No audit policy/plan documented, as there is no link into the AGA parent company's (Canadian) audit program, which determines audit plans. No high level document e.g. Quality Plan etc. to identify audit criteria and frequency.

#### 3.5.12.5 Recommendations

12.1 Update AMS strategy.

12.2 Develop internal auditing plan for AMS.

## 3.6 Post Review Implementation Plan

AGA has developed the following Post Review Implementation Plan in accordance with section 11.9 of the Audit Guidelines, which states that it is mandatory that the post-review implementation plan to include actions to address asset management process deficiencies (rated C, D, 3 or 4).

| # | Process Area | Recommendation | AGA Agreed Action | Responsible Person | Completion Date |
|---|---|---|---|---|---|
| 8.1 | Risk management | Review document control procedure to ensure document history captures record of review even if no changes were made to the document. | Document control procedure will be updated and implemented | Risk and Compliance | 31 July 2014 |
| 8.2 | Risk management | Formalise organisation (Position & title) responsibilities for risk management. | A concise responsibility table for risk management will be developed. | Risk and Compliance | 31 October 2014 |
| 8.3 | 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. | A new procedure describing the function, operation and responsibilities for the different functions of TCO RG0003 Technical Compliance Document Register is to be developed. The Conducting Formal Safety Assessments guideline is to be revised to reflect the process for ownership, responsibilities, communications and closeout of RMAPs | Technical Compliance | 31 October 2014 |
| 8.4 | 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. | The Risk Matrix is on the intranet, but not a standalone document. The Risk Matrix will be removed from the Risk Management Procedure, and made into a standalone document. | Risk and Compliance | 31 July 2014 |
| 8.5 | Risk management | All blank document numbers in PMM to be cross checked | Reference to documents, including numbering, will be included in the PMM. | Engineering | 31 July 2014 |
| 8.6 | Risk management | 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. | Engineering Services Design Guideline - Pipelines' will be finalised with the required FSA information referenced. | Engineering | 31 July 2014 |
| 8.7 | Risk management | Design guidelines references ENS GL0002 as Pipeline Design and Selection and not Engineering | The document reference for Design control and Project Management Procedure ENS | Engineering | 31 July 2014 |

| # | Process Area | Recommendation | AGA Agreed Action | Responsible Person | Completion Date |
|---|---|---|---|---|---|
| | | Services Design Guideline – Multistorey Piping ENS GL 0002 | PR0001 will be updated and reissued to document control. | | |
| 8.8 | 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) | Engineering Services Design Guidelines Valves will be finalised and reissued as a controlled document. | Engineering | 31 July 2014 |
| 8.9 | Risk management | Recommend referencing FSA in Design guidelines | The Design guidelines will be updated to include FSA information. | Engineering | 31 October 2014 |
| 8.10 | 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. | The Conducting Formal Safety Assessments guideline is to be revised to reflect the 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. | Technical Compliance | 31 October 2014 |
| 8.11 | Risk management | Implement re-assessment of 'high' and 'extreme' current risk RMAPs post RMAP closeout to demonstrate residual risk is ALARP. | The Conducting Formal Safety Assessments guideline is to be revised to define a requirement for re-assessment of 'high' and 'extreme' current risk RMAPs post RMAP closeout to demonstrate residual risk is ALARP. | Technical Compliance | 31 October 2014 |

# Appendix A
# Observation Worksheets

## Observation Worksheets

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 4 | 1.0 | **Asset planning:**<br><br>Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price). | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 1:** It is recommended that the initiatives and studies into underlying factors contributing to UAFG, which are being discussed with Energy Safety and UAFG trends continue to be monitored in conjunction with ESD. | UAFG targets established and measured for appropriate benchmarking. | | |
| 4 | 1.1 | Current key documents (Date and revision); | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 2:** As the pipeline infrastructure age is yet to reach the economic life expectancy of corrosion protection coatings, the life expectancy of 120 years applied to the currently used coatings is unproved. It is recommended that a review is conducted to confirm the validity of the asset life assumption. | Established the applied coating life expectancy | | |
| 4 | 1.2 | | Changes in strategy implementation since 2011 review | Changes in strategy clearly meet the needs of the businesses stakeholders | | |
| 4 | 1.3 | | Service levels defined | Service levels linked to stated criteria | | |
| 4 | 1.4 | | Lifecycle costs are assessed and understood Costs are justified and cost drivers identified | Business Cases contain costs of creating, operating and disposing of assets. Cost drivers are clearly identified and justified, | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 4 | 1.5 | | Funding options are evaluated | Business Cases evaluate funding options on discrete initiatives | | |
| 4 | 1.6 | | Risk of asset failure predicted | Risk assessments regularly carried out | | |
| 4 | 1.7 | | Current key documents (date and revision) | Regularly reviewed and updated | | |
| 3 | 2.0 | **Asset creation and acquisition:**<br><br>Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 3:** It is recommended that the engineering documents used for the design of the system, which have not been updated, are given priority and revised as soon as practicable. | Review Engineering documents for currency | | |
| 3 | 2.1 | Current key documents (Date and revision); | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 4:** It is recommended that engineering services staff are afforded the opportunity to attend professional development training or information sessions to remain abreast of current trends or emerging practices within the area of gas network infrastructure and gas distribution. | Human Resources training & development to reflect the needs of the business and its strategy | | |
| 3 | 2.2 | | Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions | As for Asset Planning, the opportunity cost for each project is explicitly understood. | | |
| 3 | 2.3 | | Evaluations include all life-cycle costs | Ensure all life-cycle costs are included in the asset creation option selection | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 3 | 2.4 | | Projects reflect sound engineering and business decisions | Check that projects have a balanced technical and financial evaluation and that one does not outweigh the other | | |
| 3 | 2.5 | | Commissioning tests are documented and completed | MDR's are duly complete and commissioning testing recorded | | |
| 3 | 2.6 | | Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood | Asset life-cycle aspects are recorded and regularly reviewed | | |
| 5 | 3.0 | **Asset disposal:**<br><br>Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>No previous recommendation. | N/A | | |
| 5 | 3.1 | Current key documents (Date and revision); | Under-utilised and under-performing assets are identified as part of a regular systematic review process | Core business identified and performance criteria documented | | |
| 5 | 3.2 | | The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken | Regularly reviews of asset classes undertaken. | | |
| 5 | 3.3 | | Procedures for asset decommissioning disposal, sale or transfer to other authority | Procedure for handling asset disposal addresses issues such as CP, Dial Before You Dig, GNIS, asset register etc. | | |
| 5 | 3.4 | | There is a replacement strategy for assets | | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 4 | 4.0 | **Environmental analysis:**<br><br>Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>No previous recommendations. | N/A | | |
| 4 | 4.1 | Current key documents (Date and revision); | Opportunities and threats in the system environment are assessed | SWOT methodology (or similar) used to assess external influences on assets | | |
| 4 | 4.2 | | Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved | Ensure stated obligations are met. | | |
| 4 | 4.3 | | Compliance with statutory and regulatory requirements | Statutory obligations met and accurately reported. | | |
| 4 | 4.4 | | Achievement of customer service levels | | | |
| 2 | 5.0 | **ASSET OPERATIONS:**<br><br>Operations functions relate to the day-to-day running of assets and directly affect service levels and costs. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**#5:** It is recommended that the WA Gas Networks Environmental Advisor periodically attends the regional depots to provide presentations of the environmental information typically provided in the Safety Focus meetings and Envirograms within the metropolitan area. | Depot meetings to cover all aspects of operations | | |
| 2 | 5.1 | Current key documents (Date and revision); | Operational policies and procedures are documented and linked to service levels required | Clear correlation between Asset Management System strategy and Plan to Operational Plans (Asset class plans) to achieve stated service levels. | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 2 | 5.2 | | Risk management is applied to prioritise operations tasks | Safety management study and risk analysis available, with key staff involved. Operational tasks correctly prioritised | | |
| 2 | 5.3 | | 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 | Accurate Asset register available linked through to key asset data. | | |
| 2 | 5.4 | | Operational costs are measured and monitored | OPEX costs are commensurate with planned OPEX KPI's | | |
| 2 | 5.5 | | Staff receive training commensurate with their responsibilities | All staff are knowledgeable and licenced appropriately to perform their stated and intended duties | | |
| 2 | 6.0 | **ASSET MAINTENANCE:**<br><br>Maintenance functions relate to the upkeep of assets and directly affect service levels and costs. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 6:** It is recommended that the WA Gas Networks carry out a risk assessment to consider if an increased frequency of patrols in areas where the signs are damaged often is required. | Determine and record risk associated with sign damage. | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 2 | 6.1 | Current key documents (Date and revision); | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 7:** It is recommended that the WAGN reviews its current approach to inspection of crossings to ensure alignment with AS2885.3, creation of firebreaks where necessary, and reviews current protection of facilities against falling trees and vehicles. | Inspection of road crossings to meet AS2885.3 requirements | | |
| 2 | 6.2 | | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 8:** It is recommended that intelligent pigging of the Class 600 pipelines be considered by WA Gas Networks. | Intelligent pigging data verifying pipeline life expectancy | | |
| 2 | 6.3 | | Maintenance policies and procedures are documented and linked to service levels required | Preventative, corrective and emergency maintenance completed in line with risk and expected service levels | | |
| 2 | 6.4 | | Regular inspections are undertaken of asset performance and condition | Assets analysed for performance and condition with appropriate adjustments made to operational/maintenance plans | | |
| 2 | 6.5 | | Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule | Maintenance policies and procedures are documented and linked to service levels required. | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 2 | 6.6 | | Failures are analysed and operational/maintenance plans adjusted where necessary | Failures analysed and appropriate adjustments made to operational/maintenance plans | | |
| 2 | 6.7 | | Risk management is applied to prioritise maintenance tasks | Reliability centred maintenance or similar methodology applied to asset maintenance commensurate with risk | | |
| 2 | 6.8 | | Maintenance costs are measured and monitored | OPEX KPI's established and recorded | | |
| 4 | 7.0 | **Asset management information system:**<br><br>An asset management information system is a combination of processes, data and software that support the asset management functions. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 9:** It is recommended that a procedure is developed for the verification of formulas within spreadsheets used by Engineering Services. | Asset Management Information System (AMIS) to encompass verification procedure for in-house software. | | |
| 4 | 7.1 | Current key documents (Date and revision); | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 10:** It is recommended that all engineering spreadsheets are retained on the server in accordance with the company policies. | All information that has or could be revised from time to time shall adhere to document control. | | |
| 4 | 7.2 | | Adequate system documentation for users and IT operators | User manuals to be available for Software used in the AMIS process | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 4 | 7.3 | | Input controls include appropriate verification and validation of data entered into the system | Accurate and timely information used for the AMIS | | |
| 4 | 7.4 | | Logical security access controls appear adequate, such as passwords | Appropriate user based security is deployed for the AMIS | | |
| 4 | 7.5 | | Physical security access controls appear adequate | Appropriate user based security is deployed for access. | | |
| 4 | 7.6 | | Data backup procedures appear adequate | Data integrity and security is maintained at all times including possible off-site duplication | | |
| 4 | 7.7 | | Key computations related to licensee performance reporting are materially accurate | Licensee reporting and information is verified and checked to ensure integrity of representations | | |
| 4 | 7.8 | | Management reports appear adequate for the licensee to monitor licence obligations | Master obligation register to indicate compliance. | | |
| 2 | 8.0 | **RISK MANAGEMENT:**<br><br>Risk management involves the identification of risks and their management within an acceptable level of risk. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 11:** It is recommended that the WA Gas Networks develop an action management procedure that clearly outlines responsibilities of various parties. | Risk management responsibility matrix to be published and freely available | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 2 | 8.1 | Current key documents (Date and revision); | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 12:** It is recommended that all actions raised on WAGN during external risk assessments are stored in the Action register. WA Gas Networks should request the final copy of the 3rd party (e.g. developers) FSA reports to ensure that they are aware of the 3rd party responsibilities (in case there is a dispute later on). | Action register to encompass all external audits and assessments with regular reviews | | |
| 2 | 8.2 | | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 13:** It is recommended that all risk management documentation contain the current approved risk matrix. | Risk matrix to be freely available and up to date. | | |
| 2 | 8.3 | | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 14:** It is recommended that WA Gas Networks finalises 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. | Documents to be completed and finalised in a reasonable timeframe | | |
| 2 | 8.4 | | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 15:** It is recommended that WA Gas Networks finalises 'Guidance of Gas Distribution formal Safety Assessments'. Where information has not been finalised HOLD's can be used to alert the reader to contact Technical Compliance for latest advice rather than leaving highlighted, unfinished sections. | Documents to be completed and finalised in a reasonable timeframe | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 2 | 8.5 | | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 16:** It is recommended that WA Gas Networks finalises the Formal Safety assessment and HAZOP reports shortly after workshops and do not leave unfinished ambiguous sections of the document. | Documents to be completed and finalised in a reasonable timeframe | | |
| 2 | 8.6 | | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 17:** It is recommended that a full HAZOP/HAZID is replaced with a workshop template that captures all the pertinent information for each workshop: study team, scope, objectives and exclusions. Reference can be made to guidance documents that detail how to conduct each workshop and only deviations from the standard methodologies are noted o the template. The worksheets with all the relevant information can be published. | Documents to be completed and finalised in a reasonable timeframe | | |
| 2 | 8.7 | | Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system | Corporate risk management and framework understood and communicated. | | |
| 2 | 8.8 | | Risks are documented in a risk register and treatment plans are actioned and monitored | Risk register to correlate all risks and reviewed/actioned on a regular basis | | |
| 2 | 8.9 | | The probability and consequences of asset failure are regularly assessed | Asset health is monitored on performance intervals | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 2 | 9.0 | **CONTINGENCY PLANNING:**<br><br>Contingency plans document the steps to deal with the unexpected failure of an asset. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 18:** It is recommended that the close out actions from exercises and real emergencies that are included in the action tracking register be examined regularly by WA Gas Networks management to ensure close out dates are not overdue. | Action tracking register to be current and reviewed regularly. | | |
| 2 | 9.1 | Current key documents (Date and revision); | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 19:** It is recommended that WA Gas Networks provides written evidence of close out of actions. In case is has been decided that the recommended action should not be implemented documented justification should be prepared, including risk assessment. | Action register to include evidenced closeout of actions. | | |
| 2 | 9.2 | | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 20:** It is recommended that the issues mentioned in recommendations 18 and 19 have KPI's allocated. | Action register dashboard to be freely available and communicated regularly | | |
| 2 | 9.3 | | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>**# 21:** It is recommended that the 5 year Emergency Exercise Plan be updated to include information regarding details of previous exercises. | Emergency exercise lessons learnt to be incorporated into future exercises for continual improvement. | | |
| 2 | 9.4 | | Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks | Plans to be freely available and communicated. | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 5 | 10.0 | **Financial Planning:**<br><br>The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>No previous recommendation. | N/A | | |
| 5 | 10.1 | Current key documents (Date and revision); | The financial plan states the financial objectives and strategies and actions to achieve the objectives | Fiscal planning underpins overall asset management strategy | | |
| 5 | 10.2 | | The financial plan identifies the source of funds for capital expenditure and recurrent costs | Funding of fixed costs and CAPEX are clearly identified | | |
| 5 | 10.3 | | The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) | Complete financial operating plan overview is available | | |
| 5 | 10.4 | | The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period | Firm financial forecast evident for a 5 year time horizon and indicative yields beyond. | | |
| 5 | 10.5 | | | Financial planning underpins total life-cycle of assets and service delivery | | |
| 5 | 10.6 | | Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary | Financial monitoring and adjustment evident | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 5 | 11.0 | **Capital expenditure planning:**<br><br>The capital expenditure 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.<br>Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>No previous recommendation. | N/A | | |
| 5 | 11.1 | Current key documents (Date and revision); | There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates | Conversant CAPEX plan available | | |
| 5 | 11.2 | | The plan provides reasons for capital expenditure and timing of expenditure | Conversant CAPEX plan available | | |
| 5 | 11.3 | | The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan | CAPEX planning underpins total life-cycle of assets and service delivery | | |
| 5 | 11.4 | | There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned | Capital expenditure plan to be up to date and reviewed regularly. | | |
| 4 | 12.0 | **Review of AMS:**<br><br>The asset management system is regularly reviewed and updated. | Demonstration of implementation of 2011 Review actions and recommendations:<br><br>No previous recommendation. | N/A | | |
| 4 | 12.1 | Current key documents (Date and revision); | A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current | Current and reviewed Asset management plan available, with accurate information of actual AMS. | | |

| Review Priority | Reference # | Key Process Area | Element | Effectiveness Criteria | Review Notes | Recommendations |
|---|---|---|---|---|---|---|
| 4 | 12.2 | | Independent reviews (e.g. internal audit) are performed of the asset management system | Internal and external Asset management system reviews at regular intervals evidenced. | | |

# Appendix B
# Field Photos

**Albany: Gate Station Skid**

**Albany: Potholing Survey**

**Kalgoorlie: New Water Bath Heater**