



ABN 20 009 454 111

Review Report
ATCO Power Australia (Karratha) Pty Ltd 2018
Electricity Generation Licence Asset Management
System Review

December 2018



Executive Summary

ATCO Power Australia (Karratha) Pty Ltd (APAK or the licensee) holds an Electricity Generation Licence (EGL21) issued by the Economic Regulation Authority (the ERA) under Sections 7 and 15 of the Electricity Industry Act 2004 (WA) (the Act). The licence enables APAK to construct and operate power generating facilities in accordance with the licence conditions.

Sections 14 of the Act requires APAK to provide the ERA with a report by an independent expert on the measures taken by the licensee to meet the criteria specified in the licence on the effectiveness of its Asset Management System. In September 2018 APAK commissioned Qualeng to carry out the Asset Management System review (the review) for the period 1 September 2014 to 31 August 2018. The review has been conducted and this report prepared in accordance with the "ERA's Audit and Review Guidelines: Electricity and Gas Licences (April 2014)" (the guidelines).

THE ASSETS

The licence has been granted for an area located at Lot 1996 Stovehill road, Stove Hill, Karratha, Western Australia. The Karratha Power Station generating assets consist of two GE LM 6000 PD Sprint Gas Turbine Generators (GTG) supplied by General Electric, plus auxiliary systems including the GTG Sprint water injection systems, evaporative cooling systems, a black start facility and a compressed air system. The Power Station includes the control building, workshop and spare parts store, water treatment plant and storage tanks, a natural gas supply system including heating and gas conditioning, a fire protection system, a waste water, oil and chemical disposal facility, and an evaporation pond. The nameplate power capacity of the station is 96 MW.

APAK manages the operation and maintenance of the assets however Horizon Power, the single customer, operates the GTGs once start up and synchronization are achieved.

THE REPORT

The report includes:

- (i) a summary of the objectives, the scope of the task and details of this review;
- (ii) key findings and recommendations from this review.

Separately, a post review implementation plan may be prepared by the licensee listing the review recommendations and the responses and actions proposed by APAK. If prepared, the plan will not form part of the report and will be provided separately to complete the documentation.

LICENSEE'S RESPONSE TO PREVIOUS REVIEW RECOMMENDATIONS

The previous review report covered the period 1 September 2011 to 31 August 2014. The report made two recommendations. Both recommendations were closed during this audit period.

SUMMARY OF ISSUES AND RECOMMENDATIONS, ASSET MANAGEMENT SYSTEM REVIEW

The review has found that ATCO Power Australia (Karratha) Pty Ltd has an effective plan for managing the different aspects of the asset management system and is committed to continuous improvement and regulatory compliance. It was noted that some of the documentation required more in-depth searching, in this respect the licensee is evaluating actions to improve the document control of the asset management system. Overall the review found that the licensee’s attitude towards compliance was always proactive and cooperative.

The review of the Asset Management System found nine deficiencies which have been listed in Table 1 together with the review recommendations.

Table 1- Review Asset System Deficiencies / Recommendations

Table of Current Review Asset System Deficiencies/ Recommendations			
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation
1	1.1	B2 Asset Planning Asset management plan covers key requirements. The process of AMP review described in the AMP is not clear, it is discussed in a number of sections	Recommendations on review, planning, AMP and AMS are made under EC12.1



Table of Current Review Asset System Deficiencies/ Recommendations			
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation
		<p>and it is not clear if the reviews are the ones required by the licence and legislation or internally driven by the licensee.</p> <p>The AMS review process needs to be clarified.</p> <p>The review of recent past history and trends in the areas listed below does not appear to be addressed and those changes identified as current drivers:</p> <ul style="list-style-type: none"> ◦ asset performance (say operation over the last review period), ◦ in demand (past trends and forecast) and ◦ changes in external factors. 	
2	1.2	<p>B1</p> <p>Asset Planning</p> <p>Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning.</p> <p>In regard to asset management the Review found that, while there is a simplified planning process diagram for future use in the AMP, there is no formal procedure or a more detailed definition of the planning cycle, for example it is not clear how the strategies are defined from year to year, how they are captured in the AMP and the extent of any internal peer review of strategies and plans.</p>	Recommendations on planning and AMP are made under EC12.1
3	1.9	<p>B2</p> <p>Asset Planning</p> <p>Plans are regularly reviewed and updated.</p> <p>The AMP is not clear about the frequency of reviews or the extent of internal peer reviews.</p> <p>The currency of the analysis in the AMP is not clear. In regard to the currency of the AMP review there are some inconsistencies in the analysis of external factors. The AMP notes that “the region is experiencing a sustained period of significant growth and cost pressure is high for both materials and labour in Western Australia”. Whilst this was true of the period up to possibly 2010-11, recently the growth has been limited and the labour market flat: this has not been noted in the AMP.</p>	Recommendations on review and AMP are made in EC12.1
4	4.4	<p>A1</p> <p>Environmental Analysis</p> <p>Achievement of customer service levels.</p>	1/2018 (OFI) Review AMP for inclusion of defined customer service levels and historical performance of plant against service levels.

Table of Current Review Asset System Deficiencies/ Recommendations			
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation
		The AMP does not specify the limits for supply interruption service levels, nor includes definitions of what permitted supply interruptions are, or unauthorised supply interruptions, which are all part of the objectives of the operation of the plant and govern the operation policy. The only reference made is to the PPA which is a confidential document.	
5	7.1	<p>B2 Asset Management Information System Adequate system documentation for users and IT operators.</p> <p>The Information Management Governance Framework does not provide a definition of the scope of the systems employed (for example there is no definition of what SAP contains, e-mail system policy/ operation and back-up etc), or of the processes such as the back-up process and testing, this is left to the support services organisation.</p> <p>As no documentation is available to define the processes there is a gap in the documentation and definition of the system operation.</p>	<p>2/2018 Review and identify the gaps in IT system documentation supporting the AMS:</p> <p>2.1. Create a document defining the scope of the different IT systems supporting the AMS, including the scope, operation and interaction (if any) of the systems.</p>
6	7.5	<p>B2 Asset Management Information System Data backup procedures appear adequate and backups are tested.</p> <p>There was limited written information on the back-up regime of the operations SCADA data and of the other corporate services such as SAP (for accounting and financials), e-mail, working files in Sharepoint etc.</p> <p>There is no procedure documenting the policy and details of the back-up regime.</p> <p>There was no evidence of tests being carried out in a systematic way to verify the integrity of the back-ups.</p>	<p>3/2018 A plan needs to be created documenting the operation of the back-up of the systems supporting the AMS, including for testing and storage of the back-ups. (this plan could be part of the overall plan described in Recommendation at EC7.1).</p>
7	8.2	<p>B1 Risk Management Risks are documented in a risk register and treatment plans are actioned and monitored.</p>	<p>4/2018 (OFI) Review the Risk Register and associated documentation for minor corrections and address the inclusion of due dates for actions and confirmation of date of closure of actions.</p>

Table of Current Review Asset System Deficiencies/ Recommendations			
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation
		<p>The Risk Register does not include actual dates of completion of actions.</p> <p>In regard to due dates for completion of actions, there is a 'Target Date' column however all actions except for one are shown as 'ongoing'. By examination it was noted that, for several actions, implementation of the process and its documentation should have implementation dates.</p>	
8	8.3	<p>A1</p> <p>Risk Management</p> <p>The probability and consequences of asset failure are regularly assessed.</p> <p>The Risk Register risk assessment does not drill down to an analysis of failure of assets like transformers, gas heaters, gas conditioning skids etc.</p>	<p>5/2018 (OFI) Consider the extension of risk assessment to a broader class of assets such as transformers, gas heaters etc.</p>
9	9.1	<p>A2</p> <p>Contingency Planning</p> <p>Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.</p> <p>No records were available of further crisis management response / business continuity plan tests since November 2015.</p> <p>No evidence was available to show that a formal annual Business Continuity Plan (BCP) test had been carried out. The BCP specifies, in regard to 'Electronic Data Restoration Tests', that "at least one annual test will be carried out to verify that the electronic data can be restored using the backup tape/s stored offsite."</p> <p>No documentation was available of the conduct of the August 2016 Emergency Response Exercise test and resulting actions.</p>	<p>6/2018 Strengthen the testing and record keeping of the Business Continuity Plan and Emergency Response exercises to ensure that there is a document trail of performance, findings and action completion.</p>
10	12.1	<p>B2</p> <p>Review of AMS</p> <p>A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current.</p> <p>The extent of peer review of the AMP/AMS was not clear.</p>	<p>7/2018 Documentation of the process of review of the AMP and AMS needs to be improved possibly with the creation of a defined process;</p> <p>7.1. the scope of the review needs to include all aspects of the AMS including, for example, all of the IT systems supporting the AMS, including but not limited to the financials, accounting, training and the reliability of back-ups and back-up testing.</p>

Table of Current Review Asset System Deficiencies/ Recommendations			
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation
		<p>Areas of the AMP could benefit from reviews by a wider internal forum to strengthen the assessment of external factors such as the prospect of lower demand due to competition from other generation which has not been discussed in the AMP (trends of demand have not been explicitly analysed in the AMP) and which could result in lower efficiency and the need for strategies to address this.</p> <p>The AMP notes that "the [Pilbara] region is experiencing a sustained period of significant growth and cost pressure is high for both materials and labour in Western Australia". Whilst this was true of the period up to possibly 2010-11, recently the growth has been limited and the labour market flat.</p> <p>There is no documented procedure on the review of the AMS and AMP; the AMP offers conflicting statements on review frequency and reviewers.</p> <p>There is not a clear review of recent asset operational history, lessons learnt, trends in asset performance, demand and external factors.</p>	<p>7.2. the engagement of other internal specialist/functions should assist with widening and optimising the scope and analysis within the AMP to cover all of the AMS elements;</p> <p>7.3. separate external independent review , by internal audit or other external specialist, needs also address the whole of the elements of the AMS and is to be carried out at planned intervals.</p> <p>8/2018 The AMP needs to be revised to clarify or remove the conflicting review statements (e.g. sections 1.1, 1.4 and 6.3).</p> <p>9/2018 The AMP needs to become part of the planning process.</p> <p>9.1. Lessons learnt need to be part of the improvement process and appropriate content, including up-to-date trends included in the AMP (including at least performance, demand and other external factors), possibly in a separate section to highlight the importance of change.</p>
11	12.2	<p>B1 Review of AMS</p> <p>Independent reviews (e.g. internal audit) are performed of the asset management system.</p> <p>The AMP states that an external independent review will be carried out by an independent expert, this requirement corresponds to the prescribed requirements of the licence and legislation.</p> <p>In accordance with the Effectiveness Criteria EC12.2 the AMP should give specific directions for separate independent reviews of the AMS which could be performed by ATCO's internal audit or by external specialists.</p>	<p>Recommendations are made at EC12.1</p>

AUDITOR'S OPINION, ASSET MANAGEMENT SYSTEM REVIEW

On completion of the asset management system review, after assessment and testing of the licensee's control environment the auditor has formed the opinion that during the audit period of 1 September 2014 to 31 August 2018, ATCO Power Australia (Karratha) Pty Ltd's asset management system was operating effectively.

Of the 12 areas of the asset management system, in 11 areas process and policy definition adequacy was found to be adequately defined and one area was rated as

requiring some improvement. For the performance rating 10 areas were found to be performing effectively and two areas were rated as “opportunity for improvement”.

POST REVIEW ACTION PLAN

The review has resulted, where applicable, in findings and recommendations that require corrective actions by the licensee.

If a Post Review Implementation Plan is required, the recommendations will be included in the plan by the licensee. Responses including actions, responsibilities and dates for completion will also be completed by the licensee.

This report is an accurate representation of the findings and opinions of the auditors following the review of the client's conformance to nominated Licence conditions. The review is reliant on evidence provided by other parties and is subject to limitations due to the nature of the evidence available to the auditor, the sampling process inherent in the review process, the limitations of internal controls and the need to use judgement in the assessment of evidence. On this basis Qualeng shall not be liable for loss or damage to other parties due to their reliance on the information contained in this report or in its supporting documentation.

The Post Audit Implementation Plan is a document prepared by the licensee in response to the recommendations provided by the review. As it represent the licensee's views and actions it does not form part of the review.

Approvals

Representation	Name	Signature	Position	Date
Auditor:	M Zammit		Lead Auditor / Projects Director, Qualeng	4 December 2018

Ref:	71/1	
Issue Status		
Issue No	Date	Description
1	29 Nov 2018	First formal issue
2	4 Dec 2018	Final Issue

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1 OBJECTIVES AND SCOPE OF REVIEW

1.1 BACKGROUND

ATCO Power Australia (Karratha) Pty Ltd (APAK or the licensee) generates and supplies electricity to the North West Interconnected System (NWIS) in Western Australia under the EGL21 Electricity Generation licence (the licence) granted by the Economic Regulation Authority (the ERA) on 19 December 2008 (the Licence was at Version 4, 1 July 2018 at the end of the audit period but was updated to version 5 later).

The licence has been issued under Sections 7 and 15 of the Electricity Industry Act 2004 (WA) (the Act) and enables the licensee to construct and operate generating works or operate existing generating works in accordance with the licence terms and conditions.

The licence has been granted for an area located at Lot 1996 Stovehill road, Stove Hill, Karratha, Western Australia. The generating assets consist of:

- two GE LM 6000 PD Sprint Gas Turbine Generators (GTG) supplied by General Electric, plus auxiliary systems including:
- the GTG Sprint water injection systems;
- evaporative cooling systems;
- a black start facility; and
- a compressed air system.

In addition the Karratha Power Station (KPS) includes:

- the control building, workshop and spare parts store;
- water supply and water treatment plant (WTP) including 2 bulk caustic and acidic tanks and storage tanks;
- a natural gas supply system including heating and gas conditioning;
- a fire protection system;
- a waste water, oil and chemical disposal facility;
- an evaporation pond.

The power station is connected to Horizon Power NWIS grid.

Under section 14 of the Act APAK's systems are subject to asset management system reviews at 24 month intervals or some other period as decided by the ERA. The asset management system review is to determine the effectiveness of the licensee's asset management system.

Qualeng has been engaged by APAK to conduct the asset management system review (the review) for the period 1 September 2014 to 31 August 2018. The review have been conducted and this report prepared in accordance with the "ERA's Audit and Review Guidelines:

Electricity and Gas Licences (April 2014)" (the guidelines).

1.2 OBJECTIVES OF REVIEW

The purpose of the asset management system review is to:

- *Assess the effectiveness of the measures taken by the licensee for the proper management of assets used in the provision and operation of services and, where appropriate, for the construction or alteration of relevant assets.*

1.3 SCOPE OF REVIEW

1.3.1 Scope of Asset Management System Review

The scope of the asset management system review includes the assessment of the adequacy and effectiveness of the licensee's asset management system by evaluating the key processes of:

- Asset planning
- Asset creation/acquisition
- Asset disposal
- Environmental analysis
- Asset operations
- Asset maintenance
- Asset management information system
- Risk management
- Contingency planning
- Financial planning
- Capital expenditure planning
- Review of the asset management system.

Each of the system processes was evaluated against effectiveness criteria defined in the guidelines.

Key documentation examined by the auditors is listed in Appendix A.

1.4 REVIEW PERIOD

The review covers the period between 1 September 2014 to 31 August 2018. The review was carried out between September and November 2018.

1.5 METHODOLOGY OF REVIEW

The review followed the methodology defined in the ERA's guidelines including:

- Review of documentation;
- Preparation of the review plan, risk assessment and system analysis;
- Fieldwork including the document review and meetings;
- Reporting.

These activities were supported by additional investigations to further clarify aspects of the procedures.

The review plan was prepared outlining the objectives, scope, risk assessment, system analysis, fieldwork plan, the report structure, key contacts and auditing staff.

The review adopted a risk based approach where a preliminary risk and materiality assessment was carried out. The risks resulting from lack of controls (inherent risks) and the strength of existing controls to mitigate the inherent risks were rated. The review followed the methodology defined in the guidelines. The risk assessment was carried out on each asset management system (AMS) element to assess the effectiveness of the current asset management processes and allocate review priority to each of the processes.

1.6 LICENSEE'S REPRESENTATION

Licensee representatives that participated in the review meetings or were requested to clarify aspects of the licensee's operation were:

at Perth head office and Karratha Power Station:

- Anton Beets, Manager, Governance and Compliance, main ATCO representative;
- Chris Jeffries, Senior Manager Operations & Engineering;
- Travis Graham, Station Supervisor Karratha.

1.7 LOCATIONS VISITED

The following facilities were visited during the review:

- APAK head office, Mills St, Perth
- APAK Karratha Power Station site.

1.8 REVIEW TEAM

A summary of the auditing resources utilised in the performance of the review is listed below.

<i>Item</i>	<i>Resource</i>	<i>Description</i>	<i>Hours</i>
1	M Zammit	Project Director and Lead Auditor	65
2	S Campbell	Senior Engineer, Document Reviewer and Verifier	10
3	Support staff	Document control	-

1.9 KEY DOCUMENTS AND INFORMATION

Main documents accessed by the auditors are listed in Appendix A.

1.10 LIMITATIONS AND QUALIFICATIONS

An audit provides a reasonable level of assurance on the effectiveness of control procedures, however there are limitations due to the nature of the evidence available to the auditor, the sampling process inherent in checking the evidence, the limitations of internal controls and the need to use judgement in the assessment of evidence.

In regard to the review process, the reviewer relies on evidence coming to the reviewer's attention showing that the control procedures are not effective, when the initial process and procedures do not provide sufficient evidence to the level that would be required by a review.

As noted above, due to the sampling process, the nature of the evidence available to the auditor, the limitations of internal controls and the need to use judgement in the assessment of evidence there are limitations in the level of accuracy that can be obtained in the audit and in the review and errors and non-compliances may remain undetected.

The Post Review Implementation Plan (PRIP) is a document prepared by the licensee in response to the recommendations provided by the review. As it represents the licensee's views and actions it does not form part of the review and is provided separately in accordance with the guidelines.

1.11 ABBREVIATIONS

AMP	Asset Management Plan
AMIS	Asset Management Information System
AMS	Asset Management System
APAK	ATCO Power Australia (Karratha) Pty Ltd
AS	Australian Standard
Audit	2018 Performance Audit
BOP	Balance of Plant
CAPEX	Capital Expenditure
CEJR	Capital Expenditure Justification Report
CEO	Chief Executive Officer
CMMS	Computerised Maintenance Management System
DM	Document Management
DMS	Document Management System
DSOC	Declared Sent Out Capacity
EC	Effectiveness Criteria

EH&S	Environmental Health and Safety
EIM	Enterprise Information Management System
ERA	Economic Regulation Authority
FY	Financial Year
GTG	Gas Turbine Generator
HP	Horizon Power
HV	High voltage
KPI	Key Performance Indicators
LCC	Lifecycle costs
LV	Low voltage
MOC	Management of Change
NA	Not applicable
NR	Not rated
O&M	Operation and Maintenance
OEM	Original Equipment Manufacturer
OFI	Opportunity for Improvement
OHSE	Occupational Health, Safety and Environmental
OpCom Reports	Quarterly Operational Communication Meeting Reports
OPEX	Operating Expenditure
PPA	Power Purchase Agreement
PRIP	Post Review Implementation Plan
P&L	Profit and Loss
Review	2018 Electricity Generation Licence Asset Management System Review
RMCC	Risk Management and Compliance Committee
SLA	Service Level Agreement
WO	Work Order
WTP	Water Treatment Plant
YTD	Year to Date

2 KEY FINDINGS AND RECOMMENDATIONS

2.1 LICENSEE'S RESPONSE TO PREVIOUS REVIEW RECOMMENDATIONS

The previous review report covered the period 1 September 2011 to 31 August 2014. The report made two recommendations which have been closed in the current review period of 1 September 2014 to 31 August 2018.

Table 2- Previous review non-compliances and recommendations

Table of Previous Review Ineffective Components Recommendations				
A Resolved before end of previous review period				
Reference (No/ Year)	(Asset management effectiveness rating/ Asset Management System Component & Criteria / Details of the issue)	Auditors' recommendation or action taken	Date resolved	Further action required (Yes/No/Not Applicable) Details of further action required including current recommendation reference if applicable
	Nil			
B Resolved during current review period				
Reference (No/ Year)	(Asset management effectiveness rating/ Asset Management System Component & Criteria / Details of the issue)	Auditors' Recommendation or action taken	Date resolved	Further action required (Yes/No/Not Applicable) Details of further action required including current recommendation reference if applicable
1/2014	<p>B1</p> <p>9(a) Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.</p> <p>APAK's contingency plans and arrangements are currently maintained/ described in different processes and documents.</p>	<p>APAK to identify and record all of its contingency planning arrangements in a single document such as the KPS Contingency Plan.</p>	June 2015	<p>Two documents now drive the emergency response and recovery:</p> <ul style="list-style-type: none"> - the Karratha Power Station (KPS) Emergency Response Plan for the initial response to events; - the KPS Business Continuity Plan (BCP), taking over once the emergency response is in place, where a disaster is acknowledged. <p>Two other documents cover specific events:</p> <ul style="list-style-type: none"> - the GTG Loss of Unit Contingency Plan

				- a KPS Pandemic Plan. Action considered completed.
2/2014	<p>B2</p> <p>12(a) A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current.</p> <p>12(b) Independent reviews (e.g. internal audit) are performed of the asset management system.</p> <p>APAK has not developed a formal process for ensuring the currency of the AMP, including the need for independent review of the AMP and any other references that describes the asset management system, or supports the AMP.</p>	<p>APAK to implement a:</p> <ul style="list-style-type: none"> □ Requirement for its asset management system to be subject to an independent review on a regular basis □ Register or record to capture the reviews conducted on its asset management system and the independence of the associated reviewer. 	June 2015	No
C	Unresolved at end of current review period			
Reference (No/ Year)	(Asset management effectiveness rating/ Asset Management System Component & Criteria / Details of the issue)	Auditors' Recommendation		Further action required (Yes/No/Not Applicable) Details of further action required including current recommendation reference if applicable
	No recommendations outstanding			

2.2 SUMMARY OF REVIEW

The asset management system review summary is covered in this section.

2.2.1 Asset Management Review Effectiveness Summary

The review of the Asset Management System is summarised below in Table 3. The table lists each of the 12 key asset management system processes together with the effectiveness criteria for each key component. Definition of the ratings is given in Table 4 (process and policy definition) and Table 5 (performance).

Table 3: Asset management effectiveness summary

ASSET MANAGEMENT SYSTEM COMPONENT & EFFECTIVENESS CRITERIA	Asset management process and policy definition adequacy ratings	Asset management performance ratings
1. Asset planning	A	1
1.1 Asset management plan covers key requirements.	B	2
1.2 Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning.	B	1
1.3 Service levels are defined.	A	1
1.4 Non-asset options (e.g. demand management) are considered.	NA	NA
1.5 Lifecycle costs of owning and operating assets are assessed. (also at 2.2)	A	1
1.6 Funding options are evaluated.	A	1
1.7 Costs are justified and cost drivers identified.	A	1
1.8 Likelihood and consequences of asset failure are predicted.	A	1
1.9 Plans are regularly reviewed and updated.	B	2
2. Asset creation/ acquisition	A	1

2.1 Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions.	A	1
2.2 Evaluations include all life-cycle costs.	A	1
2.3 Projects reflect sound engineering and business decisions.	A	1
2.4 Commissioning tests are documented and completed.	A	1
2.5 Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood.	A	1
3. Asset disposal	A	1
3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process.	A	1
3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken.	A	1
3.3 Disposal alternatives are evaluated.	A	NR
3.4 There is a replacement strategy for assets.	A	1
4. Environmental analysis	A	1
4.1 Opportunities and threats in the system environment are assessed.	A	1
4.2 Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved.	A	1
4.3 Compliance with statutory and regulatory requirements.	A	1
4.4 Achievement of customer service levels.	A	1
5. Asset operations	A	1
5.1 Operational policies and procedures are documented and linked to service levels required.	A	1
5.2 Risk management is applied to prioritise operations tasks.	A	1

5.3 Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural condition and accounting data.	A	1
5.4 Operational costs are measured and monitored.	A	1
5.5 Staff resources are adequate and staff receive training commensurate with their responsibilities.	A	1
6. Asset maintenance	A	1
6.1 Maintenance policies and procedures are documented and linked to service levels required.	A	1
6.2 Regular inspections are undertaken of asset performance and condition.	A	1
6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule.	A	1
6.4 Failures are analysed and operational/maintenance plans adjusted where necessary.	A	1
6.5 Risk management is applied to prioritise maintenance tasks.	A	1
6.6 Maintenance costs are measured and monitored.	A	1
7. Asset management information system	A	1
7.1 Adequate system documentation for users and IT operators.	B	2
7.2 Input controls include appropriate verification and validation of data entered into the system.	A	1
7.3 Logical security access controls appear adequate, such as passwords.	A	1
7.4 Physical security access controls appear adequate.	A	1
7.5 Data backup procedures appear adequate and backups are tested.	B	2

7.6 Key computations related to licensee performance reporting are materially accurate.	NA	NR
7.7 Management reports appear adequate for the licensee to monitor licence obligations.	A	1
8. Risk management	A	1
8.1 Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system.	A	1
8.2 Risks are documented in a risk register and treatment plans are actioned and monitored.	B	1
8.3 The probability and consequences of asset failure are regularly assessed.	A	1
9. Contingency planning	A	2
9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.	A	2
10. Financial planning	A	1
10.1 The financial plan states the financial objectives and strategies and actions to achieve the objectives.	A	1
10.2 The financial plan identifies the source of funds for capital expenditure and recurrent costs.	A	1
10.3 The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets).	A	1
10.4 The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period.	A	1
10.5 The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services.	A	1

10.6 Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary.	A	1
11. Capital expenditure planning	A	1
11.1 There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates.	A	1
11.2 The plan provides reasons for capital expenditure and timing of expenditure.	A	1
11.3 The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan.	A	1
11.4 There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned.	A	1
12. Review of asset management system	B	2
12.1 A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current.	B	2
12.2 Independent reviews (e.g. internal audit) are performed of the asset management system.	B	1

Note: Where adequacy and performance have not been rated, reasons for the lack of rating are provided in Table 6 - Asset Management System Review.

Table 4: Asset management process and policy definition adequacy ratings

Rating	Description	Criteria
A	Adequately defined	<ul style="list-style-type: none"> Processes and policies are documented. Processes and policies adequately document the required performance of the assets. Processes and policies are subject to regular reviews, and updated where necessary. The asset management information system(s) are adequate in relation to the assets that are being managed.
B	Requires some improvement	<ul style="list-style-type: none"> Process and policy documentation requires improvement. Processes and policies do not adequately document the required performance of the assets. Reviews of processes and policies are not conducted regularly enough. The asset management information system(s) require minor improvements (taking into consideration the assets that are being managed).

Rating	Description	Criteria
C	Requires significant improvements	<ul style="list-style-type: none"> Process and policy documentation is incomplete or requires significant improvement. Processes and policies do not document the required performance of the assets. Processes and policies are significantly out of date. The asset management information system(s) require significant improvements (taking into consideration the assets that are being managed).
D	Inadequate	<ul style="list-style-type: none"> Processes and policies are not documented. The asset management information system(s) is not fit for purpose (taking into consideration the assets that are being managed).

Table 5: Asset management review performance rating scale

Rating	Description	Criteria
1	Performing effectively	<ul style="list-style-type: none"> The performance of the process meets or exceeds the required levels of performance. Process effectiveness is regularly assessed, and corrective action taken where necessary.
2	Opportunity for improvement	<ul style="list-style-type: none"> The performance of the process requires some improvement to meet the required level. Process effectiveness reviews are not performed regularly enough. Process improvement opportunities are not actioned.
3	Corrective action required	<ul style="list-style-type: none"> The performance of the process requires significant improvement to meet the required level. Process effectiveness reviews are performed irregularly, or not at all. Process improvement opportunities are not actioned.
4	Serious action required	<ul style="list-style-type: none"> Process is not performed, or the performance is so poor that the process is considered to be ineffective.

2.3 OBSERVATIONS AND FINDINGS

The observations and findings of the asset management system review are reported in Table 6.

The tables include all the findings, observations and recommendations and rate APAK's policy definition adequacy and performance for the asset management system in accordance with the ERA's requirements. The rating definitions are is given in Table 4 (process and policy definition) and Table 5 (performance).

Where appropriate or where the process and policy definition is rated C or D, or the asset management performance is rated 3 or 4, recommendations are included to address the deficiencies that have resulted in those ratings.

Optionally, recommendations to address opportunities for process improvements (for items rated A, B, 1 or 2) in the review report are also included but are not mandatory.

If applicable, the licensee's corrective actions are included in the separate Post Review Implementation Plan.

2.3.1 Asset Management System Review Findings and Observations

Key findings and recommendations arising from the Asset Management System Review are listed against their Effectiveness Criteria (EC) in Table 6.

KEY TO FINDINGS AND RECOMMENDATIONS

Key	Description
<input type="checkbox"/>	Finding/ Deficiency
1. Text	Recommendations
[OFI]	Opportunity for Improvement

Key	Description
Licence Grant Date	According to the licence document at the start of the audit the licence grant date was the 19 September 2008; this was corrected on version 5 of the licence (1 November 2018) to 19 December 2008.
Audit period	1 September 2014 to 31 August 2018

Table 6 - Asset Management System Review

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
1	Asset Planning	Integration of asset strategies into operational or business plans will establish a framework for existing and new assets to be effectively utilised and their service potential optimised.	
	General: licensee structure	ATCO Power Australia (Karratha) Pty Ltd (APAK), the licensee, provides the engineering, operation and maintenance of the Karratha Power Station (KPS) through its staff and selected contractors and provides corporate systems for accounts, financial, contract, purchasing, human resources, crisis management and IT.	
1.1	Asset management plan covers key requirements.	<p>Overall the Asset Management Plan (AMP) is a mature, detailed and comprehensive document. Some of the areas of the AMP and the process of updating it need improvement.</p> <p>The AMP content is extensive:</p> <ul style="list-style-type: none"> ● the major asset list; ● objectives and strategies; ● the planning process and cycle; ● review; ● levels of service; ● compliance, including compliance with the asset management system (AMS) review requirements of the licence; ● lifecycle management plan; ● risk analysis; ● contingency; ● maintenance strategy and plan, inspection strategy, repair and replacement; ● creation, upgrade and disposal plan; 	<p>ADEQUACY OF CONTROLS: B Requires some improvement</p> <p>PERFORMANCE: 2 Opportunity for improvement</p> <p>Recommendations on review, planning, AMP and AMS are made in section 12.</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<ul style="list-style-type: none"> • asset operation strategy and goals; • training strategy; • description of the Computerised Maintenance Management System (CMMS), MEX; • asset register; • resources; • data information management; • basis for the financial plan, costs, funding; • AMP improvement. <p>The AMP was initially approved in 2010 and reviewed at approximately four years intervals except for 2018 when it was reviewed twice internally and once externally. There appear to be some areas of the AMP that require review and, possibly, improvement:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The process of AMP review described in the AMP is not clear, it is discussed in a number of sections and it is not clear if the reviews are the ones required by the licence and legislation or internally driven by the licensee. There is no written procedure to fully define the review of the AMS (see observations in section 12 Asset Management System Review). <input type="checkbox"/> The review of recent past history and trends in the areas listed below does not appear to be addressed and those changes identified as current drivers: <ul style="list-style-type: none"> (asset performance (say operation over the last review period), (changes in demand (past trends and forecast) and (changes in external factors. <p>The planning strategy appear to still mainly rest on the initial plan from the start of operation.</p> <ul style="list-style-type: none"> (There have been significant changes in the resources sectors and demand since 2011 up to 2016, with a lowering demand and soft labour demand however there did not appear to be an acknowledgment of those trends and the impact on the operation. (In the risk analysis the AMP still is referring to "The [Pilbara] region is experiencing a 	

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<p>sustained period of significant growth and cost pressure is high for both materials and labour in Western Australia.” which does not appear to reflect the state of the region and WA between 2011 and 2016;</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> References are still to old documents, such as compliance reports from 2008-09. <input type="checkbox"/> There are a number of contingency plans however the AMP only refers to the GTG Contingency Plan. <p>The Review has noted that there are Opportunities for Improvement:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The planning process require improvement; <ul style="list-style-type: none"> <input checked="" type="checkbox"/> the AMP must become part of the planning process; <input checked="" type="checkbox"/> the engagement of other internal specialist/functions should assist with widening and optimising the scope and analysis within the AMP to cover all of the AMS elements; <input checked="" type="checkbox"/> lessons learnt should be part of the improvement process and appropriate content, including up-to-date trends included in the AMP (including at least performance, demand and other external factors), possibly in a separate section to highlight the importance of change. 	
1.2	<p>Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning.</p>	<p>The Review found that stakeholders requirements have been incorporated in the planning objectives and the planning process is integrated with business planning.</p> <p>The planning process is shown in a high level diagrams in the AMP. It goes through a business annual cycle starting with strategy definition, risk review, asset life cycle review, update of business plans, asset budgets, work programs and final approval.</p> <p>The Review found that there is a “Property, Plant & Equipment Process Version 2018” which describes the financial side of the process of approval, purchase and recording of fixed assets and related depreciation.</p> <ul style="list-style-type: none"> <input type="checkbox"/> In regard to asset management the Review found that, while there is a simplified planning process diagram for future use in the AMP, there is no formal procedure or a more detailed definition of the planning cycle, for example it is not clear who participates in defining the strategies from year to year, how they are captured in the AMP and the extent of any 	<p>ADEQUACY OF CONTROLS: B Requires some improvement</p> <p>PERFORMANCE: 1 Performing effectively</p> <p>Recommendations on planning and AMP are made in section 12.</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<p>internal peer review of strategies and plans.</p> <p>The operation and objectives of the licensee are governed by the requirements of the sole customer, Horizon Power (HP) and its required service levels in the "Power Purchase Agreement" (PPA). In addition those objectives have been transferred into the maintenance provider contract in the "Plant, Parts and Services Agreement" (PPSA) and its reliability requirements.</p> <p>A detailed and comprehensive maintenance plan in the form of an operation and maintenance (O&M) spreadsheet, based on the maintenance recommendations of the Original Equipment Manufacturer (OEM), shows required maintenance and asset replacement. The O&M spreadsheet is used to transfer the information to a financial plan and creating a plan of monthly and annual budgets.</p> <p>Actual costs are then compared to planned through a set of reports and monthly reviews.</p> <p>In addition to the AMP the Review examined:</p> <ul style="list-style-type: none"> • the "ATCO Power Australia 2016 Business Plan Presentation 11082015"; • "Karratha Power Station Operations Budget 2015" including forecasts for 2016-17; • "Karratha Power Station Operations Budget 2016" including forecasts for 2017-18; • "Monthly Report - APAK Monthly Report - August 2018". 	
1.3	Service levels are defined.	<p>Service levels for the licensee are clearly defined both in the head contract document between the licensee and the single customer, the PPA, and noted in the AMP.</p> <p>The PPA service levels cover a range of parameters including availability, heat rate, water use and compliance with the PPA protocols.</p> <p>The PPA service levels are continually monitored and penalties may apply when they are not met.</p> <p>The AMP defines further other service levels arising from the operation of the plant, including:</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<ul style="list-style-type: none"> • legislative • local government • environmental • occupational safety and health (OSH) • dangerous goods • regulatory. <p>Service level performance is also reported in the Monthly Operating Reports.</p>	
1.4	Non-asset options (e.g. demand management) are considered.	Not applicable to this operation. The operation relies on supplying power required by the customer. The assets are geared to supply as much power as required up to the plant capacity to the customer requirements, therefore there is no demand management as such.	NA
1.5	Lifecycle costs of owning and operating assets are assessed.	<p>There is a process for assessing the asset lifecycle costs.</p> <p>The lifecycle cost of owning and operating the assets was originally calculated in financial plans that were submitted to the ERA during the licence grant application.</p> <p>The lifecycle management plan includes a "Long Range Outage Plan", a "Rolling O&M Forecast" and individual maintenance plans for the assets. Costs of maintenance and replacement are forecast and tied up to the assets' life cycle and summarised in the overall plans. Project cost for activities such as plant improvement are also added to the plans.</p> <p>Actual costs are used to update the plans and improve the forecasts. Actual and planned costs are routinely reported against and reviewed by management.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>
1.6	Funding options are evaluated.	<p>The PPA provides for a full cost recovery model so that, on principle, there is no requirement for alternative funding.</p> <p>Generally funding is evaluated through the budget process. The annual budget process is documented and involves the assessment of past and future activities, associated costs, past and future revenue and cost trends. Once the budget is firmed up it is presented for approval.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<p>Due to the model of full cost recovery agreed in the PPA, between the licensee and the single customer, the business cashflow services the expenditure and funding alternatives have not been necessary however, where beneficial, costs have been adjusted through refinancing and delayed expenditure.</p>	
1.7	<p>Costs are justified and cost drivers identified.</p>	<p>The Review found that cost drivers are adequately identified and there are processes in place to justify costs.</p> <p>Cost drivers are tied up with risk, risks are identified in a "Risk Register" and a "Quality Plan", the associated cost drivers have been identified through analysis of maintenance, improvement, environment, safety etc. Main cost drivers are identified and are covered by revenue from tariffs.</p> <p>The AMP summarises the cost drivers:</p> <ul style="list-style-type: none"> • maintenance accounts for most of the expenditure and exposure has been limited through the PPSA and individual Balance of Plant (BOP) contracts; • maintenance of the GTG, though governed by the PPSA, is subject to Foreign Exchange fluctuations that can impact significantly on the total maintenance expenditure; • retirement of assets; • internal O&M costs. <p>The GTGs represent the major maintenance cost and risk is minimised by the PPSA which is a fixed maintenance contract. Costs due to unplanned plant retirement represent higher risks and are closely monitored.</p> <p>Capital improvement projects receive close scrutiny by both the licensee and the customer and have to go through thorough engineering and financial checks before being submitted for approval.</p> <p>There is a process of budgeting and approval as well as regular review of the financial performance through reporting and monthly meetings.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
1.8	Likelihood and consequences of asset failure are predicted.	<p>The Review found that there is a process in place and evidence that the risks of asset failure, including likelihood and consequences are identified.</p> <p>APAK has a process in place to review and manage risks. The main documents defining the risk management process are:</p> <ul style="list-style-type: none"> • the "ATCO Group Risk Management and Control Policy A-08"; • "AA-RSK-FWK-01 ATCO Australia POS Risk Management Framework"; • the "APAK Risk Register/ KPS Operating Risk Assessment" (last updated 1 August 2017) which captures high level risks for assets and operation; • the "AA-GRC-CH-01 Risk Management and Compliance Committee (RMCC) Charter" which defines the RMCC composition, its scope and operation. <p>The Review found that the following documents are used to record the results of asset risk analysis:</p> <ul style="list-style-type: none"> • the "Current APAK Risk Register/ KPS Operating Risk Assessment" includes risks of asset failures or deficiencies such as: <ul style="list-style-type: none"> └ switchgear failure and arc flash └ insulation fault or malfunction └ gas leakage and exposure to gas └ environmental contamination due to leaking equipment, └ GT failures, └ critical spares, └ IT failures and attacks. <p>The document showed controls and actions resulting from risk review meetings.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (Findings)	Recommendations
1.9	Plans are regularly reviewed and updated.	<p>There was evidence to show that the asset management plan is reviewed and updated however the frequency of reviews has been low and the scope of the update has not been consistent.</p> <p>In discussions with the Senior Manager Operations & Engineering and the Manager, Governance and Compliance it was found that a plan to revise the AMS is in progress and that the upgrade of the AMS is expected to be rolled out in 2020.</p> <p>The AMP was issued in 2010 and revised and updated at approximately four year intervals, however in 2018 it has been subject to one review and an update following an external review completed by June 2018. Last update was on 21 June 2018, after the external review. Whilst the number of the reviews is good there was a significant time gap between reviews during this audit period.</p> <p>There are quarterly meetings with the customer on service levels, monthly reports on performance and business plans annually, however the AMP does not capture the changes at regular intervals:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The AMP is not clear about the frequency of reviews or the extent of internal peer reviews: <ul style="list-style-type: none"> (The Review found that there are three possible interpretation of internal review frequency in the AMP and that there is no clarity on which are Licence/ERA driven reviews and which are internally driven. (The currency of the analysis in the AMP is not clear. In regard to the currency of the AMP review there are some inconsistencies in the analysis of external factors. The AMP notes that “the region is experiencing a sustained period of significant growth and cost pressure is high for both materials and labour in Western Australia”. Whilst this was true of the period up to possibly 2010-11, recently the growth has been limited and the labour market flat: this has not been noted in the AMP. <ul style="list-style-type: none"> ▪ Possibly a wider scope of review involving additional internal stakeholders may have addressed this and may have provided a more up-to-date review. (It was observed that the AMP does not explicitly highlight and analyse recent asset 	<p>ADEQUACY OF CONTROLS: B Requires some improvement</p> <p>PERFORMANCE: 2 Opportunity for improvement</p> <p>Recommendations on review and AMP are made in section 12.</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<p>performance or events in the period between updates. Updated performance is noted in internal reports and quarterly reports of customer's meetings. In general it is beneficial to include in the AMP a summary of the asset status and performance helping to identify critical items that may not be operating optimally and/or will require future attention, thus driving the planning process.</p> <p>Recommendations are made in section 12.</p>	
2	Asset Creation and acquisition	A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery.	
2.1	Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions.	<p>The Review found that there is an adequate process for managing project evaluation:</p> <ul style="list-style-type: none"> • Potential projects are identified in a project register which includes both approved and suggested projects, as well as project parameters such as costs, timing. • The AMP states that a "temporary or permanent change to an asset is required to follow the Management of Change process. A "Management of Change" (MOC) template is followed to analyse all aspects of projects proposals, including impact on the plant, controls, health and safety. • A "Capital Expenditure Justification & Request Form" (CEJR) is prepared and is submitted for approval to the required authority level. • The CEJR forms include assessment of options to address problems, their cost and risk. • Each capital project is separately identified and evaluated, for each significant project, a report is submitted to the Australian Board outlining the requirement for the project and the expected project expenditure. • Financial approval of the capital budget follows an annual cycle documented in the "Property, Plant & Equipment Process". Capital Budget for the power station are created by the operation manager and approved by the Board annually. <p>Both minor and major projects were reviewed and adequate documentation found for the following projects:</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (Findings)	Recommendations
		<ul style="list-style-type: none"> • "Stairways, Access ladders and platforms", December 2017; • "Civil and Structure Work for Major Outage", November 2016; • "SCADA System Upgrade", a major project approved October 2014. 	
2.2	Evaluations include all life-cycle costs.	<p>The Review found that all projects evaluations reviewed included life cycle costing. It is noted that none of the projects that were carried out during the audit period and were examined were complex and required costing evaluation beyond capital expenditure.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>
2.3	Projects reflect sound engineering and business decisions.	<p>The Review found that there is an adequate process and found adequate documentation leading to the approval of projects.</p> <p>The CEJR form records the information necessary for the acquisition process for projects like the upgrade of the SCADA equipment noted at EC No 2.1.</p> <p>Examination of projects noted at EC 2.1 showed that, through the CEJR approval the following processes took place:</p> <ul style="list-style-type: none"> • a definition of the problem and of key drivers; • review and costing of alternative options; • an analysis of risks for proceeding and not proceeding; • recommendation and justification. <p>The projects examined showed that there was sound justification for the project approval.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>
2.4	Commissioning tests are documented and completed.	<p>The Review found evidence that commissioning tests are completed and documented. There were limited instances of significant asset acquisitions or creation during the Review period. In discussion with the Station Supervisor (Karratha) and examination of relevant evidence the Review found that:</p> <ul style="list-style-type: none"> • A major project, the "SCADA System Upgrade", approved October 2014 was subject to in-factory acceptance tests completed in December 2014 as per the "Wonderware Factory Acceptance Testing 8514-IRS" report. 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<ul style="list-style-type: none"> Minor jobs, where minor assets are subject to change, require to follow the Management of Change (MOC) process which is fully documented through a multi-tabbed form with the same name. The form requires documentation of final acceptance tests. 	
2.5	Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood.	<p>Obligations have been documented in an extensive "Obligations Register" and responsibilities assigned. There was evidence of performance of the process through regular reporting against obligations.</p> <p>Obligations of the licensee have been identified and documented through a range of documents:</p> <ul style="list-style-type: none"> the AMP carries a comprehensive summary of obligations of the licensee including: <ul style="list-style-type: none"> legislative local government environmental occupational safety and health dangerous goods regulatory; The Obligations Register lists the requirements of applicable Acts, Regulations and Codes, the appropriate actions required, responsibilities and special reporting; <ul style="list-style-type: none"> the Review examined the requirements of the Environmental Protection Act and found evidence of required annual emission tests through reports on the "Emissions Testing - Karratha Power Station" which were carried out by NATA accredited service provider. 	<p>ADEQUACY OF CONTROLS: A</p> <p>Adequately defined</p> <p>PERFORMANCE: 1</p> <p>Performing effectively</p>
3	Asset Disposal	Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.	
3.1	Under-utilised and under-performing assets are identified as part of a regular systematic review process.	The Review found that through the regular reporting of service levels and asset performance in internal and quarterly external reports there is a process of review and identification of under-utilised and under-performing plant.	<p>ADEQUACY OF CONTROLS: A</p> <p>Adequately defined</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<p>The Review found:</p> <ul style="list-style-type: none"> • The process of performance review is in fundamentally customer driven as the revenue is generated by customer demand under a customer defined performance regime. • The AMP has included strategies for meeting customer service levels and identified the assets that are critical to achieving those service levels. Other plant such as ancillary equipment and some of the Balance of Plant (BOP) are still required but are not subject to the same level of review. • Weekly and monthly internal reports on the plant performance highlight plant operation status, in addition quarterly meetings with the customer, recorded in "Quarterly Operational Communication Meeting Reports" (OpCom Reports) show performance against customer service level and highlight plant performance. • During the audit period no assets were identified as under performing however there were instances where the operation of the main assets such as the GTGs required inspection, adjustments or rectification. Due to the criticality of the plant actions were given high priority and unplanned maintenance was carried out as required in 2015. • In the later part of the audit period both GTGs have been operated intermittently and at low loads causing inefficiency, due to the customer's drop in demand. 	<p>PERFORMANCE: 1 Performance was effective.</p>
3.2	<p>The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken.</p>	<p>The Review found that there is a process for the identification of under-performance and under utilisation and for enabling corrective action.</p> <p>The Review found:</p> <ul style="list-style-type: none"> • Internal weekly "KPS Status Reports" and monthly "KPS Monthly Report" on plant performance highlight plant operation status, in addition quarterly meetings with the customer, recorded in OpCom Reports, show performance against customer service level and highlight plant performance. • During the audit period no assets were identified as under performing however there were instances where the operation of the main assets such as the GTGs required inspection, adjustments or rectification. Due to the criticality of the plant actions were given high priority and unplanned maintenance was carried out as required in 2015. 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<ul style="list-style-type: none"> In the later part of the audit period both GTGs have been operated intermittently and at low loads causing inefficiency, due to customer's drop in demand. <p>The Review examined several internal and external OpCom Reports for the period 2014 to 2018 and found that, as noted above, where lower performance or occasional malfunction were encountered, reasons were found and corrective or improvement actions taken.</p>	
3.3	Disposal alternatives are evaluated.	No significant assets were disposed of during the review period. The AMP identified the maintenance strategy for major items of plant and due to the low age of the plant there has been no need for retiring plant.	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: NR Not rated. No significant assets were disposed of during the review period</p>
3.4	There is a replacement strategy for assets.	<p>The Review found that there is a replacement strategy for the assets which is outlined in the AMP:</p> <ul style="list-style-type: none"> The replacement strategy is based on the criticality of the plant in regard to service levels (e.g. availability, efficiency), cost, redundancy, safety and reliability). Six major items of plant have been analysed through this process in the AMP: <ul style="list-style-type: none"> the initial analysis at the start of the project had identified the criticality of the GTG to the achievement of service levels so that a spare GT rotor was purchased to enable the quick turnaround where a GT needs maintenance; There is a rolling three year O&M plan which includes all recommended maintenance and replacement of assets; Replacement of plant can occur where there are opportunity savings: <ul style="list-style-type: none"> overhaul of air compressor unit was more expensive than purchase of a new unit leading to the replacement of the existing unit, this work was in progress at the time of the Review. 	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (Findings)	Recommendations
4	Environmental Analysis	The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain requirements.	
4.1	Opportunities and threats in the system environment are assessed.	<p>The Review found that there are adequate processes in place to separately assess internal and external risks and opportunities:</p> <ul style="list-style-type: none"> At corporate level the Risk Management & Compliance Committee (RMCC) has a charter which requires regular meetings to “periodically review and assess ATCO Australia’s risk framework, criteria, and profile, monitor the effectiveness of internal controls and assist the Managing Director in the reporting of risk and compliance matters”. Risks are recorded and analysed in the “Current APAK Risk Register-KPS Operating Risk Assessment” which includes both internal and external risks, such as ‘cyber attack’, and provides assessment and mitigation of threat. The RMCC meets biannually and records changes to the risks in its “RMCC Meeting” paper which also includes a compact version of the risk register. The AMP carried out an analysis of likely threats to the operation of the assets including, among others, technological risks, resourcing due to remote location, market exposure, financial, regulatory and political. 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>
4.2	Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved.	<p>The Review found that there is a process for targeting and measuring performance standards. In general performance standards are met however there were instances where they were not achieved and these instances are reviewed under the PPA with the customer.</p> <ul style="list-style-type: none"> The AMP describes the service levels against various criteria including: <ul style="list-style-type: none"> PPA and contract, legislative, regulatory, local government, environmental, safety and dangerous goods; the AMP performance standards are aligned against the service levels. Performance against the standards is reported regularly in internal “KPS Monthly Status Reports” and externally to the customer in OpCom Reports. There were instances where some of the performance standards/customer service levels were not met, those instances were reported by e-mail to the customer, in the quarterly 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<p>OpCom Reports to the customer and registered in registers such as the "10.c 2017 - HP Supply Constraints Register". Under the PPA a certain number of "supply constraints" (supply loss or failures) are allowed, once that number is reached penalties apply.</p>	
4.3	Compliance with statutory and regulatory requirements.	<p>The Review found that there is a system for recording statutory and regulatory requirements and monitoring compliance. The records show that there has been compliance with the requirements.</p> <p>The AMP lists statutory and regulatory requirements and provides a brief description of main obligations.</p> <p>The primary document for controlling compliance to statutory and regulatory requirements is the "Obligations Register". This register contains a listing of requirements of applicable Acts, Regulations and Codes, the actions necessary for compliance, responsibilities and special reporting:</p> <ul style="list-style-type: none"> the Review examined the requirement of the Environmental Protection Act and found evidence of required annual emission tests through reports on the "Emissions Testing - Karratha Power Station" which were carried out by a NATA accredited service provider. <p>The register is reviewed six monthly by its stakeholders and regularly updated by the Manager Governance and Compliance.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>
4.4	Achievement of customer service levels.	<p>The Review found that there is a process for monitoring customer service levels. In general service levels are met however there are instances where the service levels are not achieved which may results in penalties. These instances are reviewed and resolved under the PPA with the customer.</p> <p>Customer service levels are clearly defined in the PPA and are outlined in the AMP. Performance against customer service levels is reported regularly in internal monthly reports, "KPS Monthly Status Reports", and external quarterly reports, the OpCom reports. Availability service level are also notified in "Horizon Power Supply Constraint Notifications" and monitored in registers, "Horizon Power Supply Constraint Notifications Register".</p> <p>By discussion with the Senior Manager Operations and Engineering and the Station Supervisor (Karratha) and review of the PPA, registers and OpCom reports from 2015 to 2018</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p> <p>1. (OFI) Review AMP for the inclusion of defined customer service levels and historical performance of plant against service levels.</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<p>it was found that:</p> <ul style="list-style-type: none"> • the main customer service levels were: <ul style="list-style-type: none"> (related to the availability of the plant (when supply is required), in blocks of half hour; (the efficiency of the plant, measured as heat rate, relative to environmental conditions, GT fired hours, overhaul status of GT and to OEM guaranteed values; (water consumption levels. <p>It was noted that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The PPA between the licensee and the customer defines terms such as USC, PSC, PMSC, which are used as service levels governing the operation and supply policy of the plant. Some of these parameters have limits that result in penalties to the licensee if exceeded. In general asset management systems need to evaluate the compliance with applicable legal and other regulatory or other external requirements at a determined frequency. In general AMPs set service levels and then report on historical performance of plant against service levels <p>The Review found that the AMP does not specify the limits for supply interruption service levels, nor includes definitions of what permitted supply interruptions are, or unauthorised supply interruptions, which are all part of the objectives of the operation of the plant and govern the operation policy. The only reference made is to the PPA which is a confidential document.</p>	
5	Asset Operations	Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.	
5.1	Operational policies and procedures are documented and linked to service levels required.	<p>The Review found that both operational policies and procedures are documented and linked to service levels:</p> <ul style="list-style-type: none"> • The AMP deals at length with policies on the proposed operation of the plant and to the service levels. The policies include: <ul style="list-style-type: none"> (plant performance; 	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<ul style="list-style-type: none"> ⌈ condition monitoring; ⌈ risk assessment on criticality of plant dictating service and spare parts strategies; ⌈ management of data, information and documentation; ⌈ management of change; <ul style="list-style-type: none"> ● service levels are linked to the customer requirements which are spelt out in the PPA, these include generation standards, efficiency standards, whilst the customer is responsible for the quality of the fuel and water. <p>The AMP also refers to the "Operating Protocol" for the day to day operation of the power station. The Operating Protocol sets the framework for the achievement of the customer service levels, in brief it covers:</p> <ul style="list-style-type: none"> ● communication; ● responsibilities for operation; ● planned and unplanned maintenance; ● testing; ● incident reporting and emergency response. <p>A suite of operational procedures, the "Standard Operating Procedures" (SOP), is also available which include among others:</p> <ul style="list-style-type: none"> ● "KPS Work Management - Work Initialisation", which shows the consequences of failure in terms of environmental and regulatory consequences, asset and generation costs, and safety consequences; ● "Managing Defective Plant-Equipment" ● "Manage Hot Work" ● "Hazardous Manual Tasks Procedure" 	

EC No.	AMS Element / Criteria	Review summary (Findings)	Recommendations
		<ul style="list-style-type: none"> • "Emergency Procedure Flipchart". 	
5.2	Risk management is applied to prioritise operations tasks.	<p>Risk management is routinely applied in the operation of the assets. The AMP outlines service levels and strategies for their achievement including:</p> <ul style="list-style-type: none"> • the assessment of operational risks in view of the supply contract (the PPA) and the management of those risks; • assessment of risk for each piece of major equipment under several score categories to determine equipment criticality and the prioritisation of O&M activities; • adherence to OEM scheduling of preventive maintenance and inspection which has been entered in the power station Computerised Maintenance Management System (CMMS) MEX. <p>Reduction of risk extends to:</p> <ul style="list-style-type: none"> • the employment of specialist contractors with the required competency for servicing of critical plant such as the GTGs; • continuous assessment of plant condition through condition monitoring and planned inspections to reduce the risk of plant failures; • appropriate O&M response to plant condition; • review of plant performance through weekly and monthly reports. <p>A set of Standard Operating Procedures (SOP) have been created to help operator in prioritising and carrying out tasks:</p> <ul style="list-style-type: none"> • the "KPS Work Management - Work Initialisation" shows the consequences of failure in terms of environmental and regulatory consequences, asset and generation costs, and safety consequences; • the "KPS Work Management" procedure defines eight levels of priority, starting from the top priority for critical tasks which need immediate action and may result in safety, environmental or contractual risk and not meeting the station's service levels, to the lower 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		priority of non-urgent jobs which can be scheduled within a planned outage.	
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.	<p>The Review found that an Asset Register was in operation, both at the KPS and its Head Office, and it was consistent with the Review criteria.</p> <p>The AMP specifies that range of data that should be present in the MEX Asset Register. This register is used by the asset managers and is held within the MEX CMMS. It contains O&M data for major and minor assets.</p> <p>A search was made for the data stored for the Air Compressor no. 1, the data stored in the MEX register included:</p> <ul style="list-style-type: none"> • the Air Compressor details; • location; • work history from 2014 as well as planned work (managed under "Work Orders"). <p>Air Compressor plans including drawings were stored in the separate Enterprise Information Management System (EIM), records of costs incurred on the equipment were also stored in the EIM and entered in SAP, in the accounting framework.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>
5.4	Operational costs are measured and monitored.	<p>The Review found that operational costs are measured and monitored.</p> <p>The process includes:</p> <ul style="list-style-type: none"> • entry of labour costs into the accounting system in SAP; • parts costs are entered in the Operational Spreadsheet for planning purposes, parts procurement has to go through an approval from the appropriate delegated authority on a "Purchase Order Request" form; • purchasing data such as quote, purchase order number, cost centre, actual cost, are entered; • reports are generated from SAP and circulated to the Operations Supervisor; • the information is entered in the appropriate spreadsheet and reported in Monthly Reports where it is assessed against the forecast expenditure. <p>There were no significant cost variations in the reports reviewed.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
5.5	Staff resources are adequate and staff receive training commensurate with their responsibilities.	<p>Staff numbers appeared adequate for the operating regime of the Power Station. Documentation and performance of the training process appeared adequate.</p> <ul style="list-style-type: none"> • A training matrix is in place and managed by the operational staff. The matrix has information on mandatory in-house and external training, desirable training and recording of primary and additional qualifications. • Staff and training requirements were identified; most of the training had been completed. There was training pending which was found to be caused by either recent addition to the training requirements, staff absence or temporary unavailability of training provider to attend the regional location. • There was evidence of management of processes through structured forms or files that guided the user to perform the necessary steps in order to complete the task (e.g. the "Management of Change" form). 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>
6	Asset Maintenance	Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.	
6.1	Maintenance policies and procedures are documented and linked to service levels required.	<p>The Review found that maintenance policies and procedures were well documented and related to the required service levels.</p> <p>AMP has maintenance objectives, strategy and philosophy including:</p> <ul style="list-style-type: none"> • maintenance levels to be maintained as follows: <ul style="list-style-type: none"> ↳ to Original Equipment manufacturer (OEM) parameters; ↳ through long term service agreement, "Power Plant Service Agreement" (PPSA) with specialist contractor for maintenance of GTGs and other selected assets; ↳ other assets to be maintained through service contracts on "as needed" basis; • maintenance of critical spares to minimize interruptions; • management of change (MOC) process to document the process for implementing changes; • risk assessment on criticality of plant dictating service and spare parts strategies; 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<ul style="list-style-type: none"> • condition monitoring and inspection to support the regime of preventive maintenance; • recording of maintenance activities in the CMMS, MEX; • regular reporting of asset performance and performance against service levels. 	
6.2	Regular inspections are undertaken of asset performance and condition.	<p>The Review found that there is a well controlled regime of asset inspections and regular monitoring of asset performance and condition.</p> <p>A maintenance plan is identified in the O&M spreadsheet. The spreadsheet contains the maintenance regime for the assets based on the OEM Maintenance Manuals and information and includes frequency and timing of maintenance and parts replacement.</p> <p>For every asset a timeline of maintenance activities has been identified.</p> <p>Forthcoming and on-going maintenance is reported in different level of detail in both Weekly Status Reports and Monthly Reports (internally) and OpCom Reports to the customer.</p> <p>Review of O&M activities in the period 2017-2018 showed:</p> <ul style="list-style-type: none"> • 8000hr GE assisted Borescope Inspection on GTG1 and GTG2 in April 2018 as per forecast outage plan; • "Lube Oil Analysis" required every 3 months; examined task Work Order (WO) WO22675, WO Showed which procedure documents were required for the sampling; WO 'History' sighted showed completion of the WO on 11/1/2018. 	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>
6.3	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule.	<p>The Review found that maintenance plans were well documented and were completed as forecast except where the opportunity arose for rescheduling the maintenance to periods more convenient to both the licensee and the customer.</p> <p>Due to a lowering demand for electricity there is a possibility that maintenance may be delayed where appropriate, for example, on the GTGs where the maintenance is carried out based on the number of fired hours.</p> <p>The Review inspected:</p> <ul style="list-style-type: none"> • Preventative maintenance listing in MEX, 	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (Findings)	Recommendations
		<ul style="list-style-type: none"> • 8000hr GE assisted Borescope Inspection on GTG1 and GTG2 in April 2018 as per forecast outage plan. • Lube Oil Analysis every 3 months; • Monthly Fire System Service; • Site security maintenance. <p>As at the end of August 2018, 525 Work Orders (WO) had been closed in the year, 5 were open and had started and one was open but waiting for parts.</p>	
6.4	Failures are analysed and operational/maintenance plans adjusted where necessary.	<p>The Review found that the licensee had a process for investigating and assessing failures and taking corrective measures in operation and maintenance.</p> <p>The system of failure management included:</p> <ul style="list-style-type: none"> • electricity delivery tracked at half hour intervals, also the customer has the facility to monitor the operation of the power station, • details of the requirements for reporting of special events is documented in the PPA and the "Operating Protocol between APAK and Horizon Power" (2009) (OP); • written reports are required under the OP in the event of any interruption, reports need to include reasons and causes of interruptions; • incidents and faults need to be logged in event registers such as the "Operational Events Report Register"; • daily handover of plant from APAK to HP is accompanied by a written note detailing any minor faults or unusual operating conditions. <p>The Review examined the Operational Events Report Register:</p> <ul style="list-style-type: none"> • "GTG1 Vent Fan Drive Relay Module Fault", April 2018, report was sighted; • GTG2 Trip due to system disturbance was sighted; <p>resulting file "ER20180510 - GTG2 Trip due to system disturbance. 125VDC system</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<p>fault" was examined and included:</p> <ul style="list-style-type: none"> ("ATCO Power Karratha Event Report Form" reporting on the fault and actions and recommendation of review of 'Black Start' procedure noted; ("Plant Event Report To Horizon Power" reporting event to HP. <p>In both cases communications showing actions and dates were available as well as, where required, "Management of Change" documentation covering the analysis and changes.</p>	
6.5	Risk management is applied to prioritise maintenance tasks.	<p>The Review found that there is a documented system which is used for the prioritization of maintenance tasks.</p> <p>The Review found:</p> <ul style="list-style-type: none"> • the AMP outlines service levels and strategies for their achievement including maintenance strategies in view of the supply contract (the PPA) and the reduction of risks; • assessment of risk for each piece of major equipment was made under several score categories to determine equipment criticality and the prioritisation of maintenance activities; • adherence to OEM scheduling of preventive maintenance and inspection which has been entered in the power station Computerised Maintenance Management System (CMMS) MEX; • Standard Operating Procedures created to help operators in prioritising and carrying out tasks: <ul style="list-style-type: none"> (the "KPS Work Management - Work Initialisation" procedure shows the consequences of failure in terms of environmental and regulatory consequences, asset and generation costs, and safety consequences; (the "KPS Work Management" procedure defines eight levels of priority, starting from the top priority for critical tasks which need immediate action and may result in safety, environmental or contractual risk and not meeting the station's service levels, to the lower priority of non-urgent jobs which can be scheduled within a planned outage. 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		Review of maintenance task in the CMMS MEX showed that Work Orders for maintenance work had been subject to prioritization.	
6.6	Maintenance costs are measured and monitored.	<p>The Review found that there is a process of measuring maintenance costs and monitoring them.</p> <p>The Review found:</p> <ul style="list-style-type: none"> • there is a process for parts quotations, requests of procurement/expenditure, approval to proceed, Purchase Order creation and recording of costs into the SAP system and financial ledgers; • all labour costs are also entered into the SAP system; • maintenance cost for GTGs are regulated by the PPSA; • all additional costs are reported in the "APAK Monthly Reports" which include the "Business Plan" target for the month and Year to Date (YTD), and 'actuals' figures; • expenditure is also monitored monthly in the Financial Plan and through monthly meetings. <p>Variations were noted in Monthly Reports however there was no commentary except for a note on need to maintain budget without putting the station at risk. Variations are however commented upon in the annual "APAK Budget Papers".</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>
7	Asset Management Information System (AMIS)	The asset management information system provides authorised, complete and accurate information for the day-to-date running of the asset management system. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards.	
7.1	Adequate system documentation for users and IT operators.	<p>The Review found that there is system documentation however there is a lack of definition of the scope, operation and interaction of the various system in use and lack of definition of some of the required data management processes such as back-up and back-up testing.</p> <p>Policy and policy framework of IT systems is provided in a policy document "AA-GOV-FWK-01 Information Management Governance Framework" (IMG Framework). The document outlines</p>	<p>ADEQUACY OF CONTROLS: B Documentation requires some improvements</p> <p>PERFORMANCE: 2 Performance of the process need some improvement</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<p>the establishment of the Enterprise Management System (EIM) and the services provided by specialist support entities, such as Wipro.</p> <p><input type="checkbox"/> The IMG Framework does not provide a definition of the scope of the systems employed (for example there is no definition of what SAP contains, e-mail system policy/operation and back-up etc), or of the processes such as the back-up process and testing, this is left to the support services organisation. As no documentation is available to define the processes there is a gap in the documentation and definition of the system operation.</p> <p>The IMG Framework also states that "Induction Training will refer to the IMG Framework and supporting standards, policies, forms".</p> <p>Staff starting at the KPS have to undergo an Induction that covers IT topics such as:</p> <ul style="list-style-type: none"> • EIM for document management; • Safetrac, SCADA and CMMS (MEX) walkthrough; • IT policy. • Additional MEX training is provided, while further assistance is provided online: <ul style="list-style-type: none"> (MEX provides online help panels that assist the user in navigating and using the system; • Safetrac provides for online training. Annually the Risk Management and Compliance Committee approve the Safetrac training plan, it includes for induction training topics (with yearly refreshers) on: <ul style="list-style-type: none"> (Code of Ethics (Cultural Awareness (Anti-Bullying and Harassment (Discrimination (Workplace health and safety (Cyber Security (Privacy. 	<p>2. Review and identify the gaps in IT system documentation supporting the AMS:</p> <p>2.1. Create a document defining the scope of the different IT systems supporting the AMS, including the scope, operation and interaction (if any) of the systems.</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<p>There is some documentation on the networking of the systems, however this is in the form of diagrams that are not user friendly.</p>	
7.2	<p>Input controls include appropriate verification and validation of data entered into the system.</p>	<p>The Review found that there was sufficient verification and validation of the data used for the calculation of service levels and performance.</p> <p>The Review found:</p> <ul style="list-style-type: none"> • Metering requirements are documented in the "APAK Station metering and measurement manual" <ul style="list-style-type: none"> (the gas flow meters are subject to calibration on a bi-annual basis by an authorised third party; (gas composition is measured by gas chromatographs which are calibrated automatically on a daily basis. • Water and electricity metering equipment is witness inspected and routinely calibrated by APAK and HP. Calibration of metering equipment is performed by third parties, all reports available to both APAK and the customer; <ul style="list-style-type: none"> (electricity delivery is measured by transducers and meters which are checked every 2 years, calibration of the meter/totaliser is carried out every 5 years and calibration of the instrument transformers (Current Transformers and Voltage Transformers) every 10 years. (Routine test report "Engineering Services Report", June 2017, from a contracted third party was sighted, verifying the accuracy of transducers and kWh meter for GTG2. • Data obtained from metering equipment is used for billing and invoicing and checked against tolerances. • Separate 'Fired Hour Meters' are APAK's assets, these do not have the required metering accuracy however provide an independent check of the figures obtained from the primary meters. • Data entered by operational staff on the O&M Plan is checked by the Senior Manager 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<p>Operations and Engineering, the financial figures resulting from this data are checked by the accounting department and subject to review at monthly meetings.</p>	
7.3	<p>Logical security access controls appear adequate, such as passwords.</p>	<p>The Review found evidence of an adequate system for security access control.</p> <p>The Review found:</p> <ul style="list-style-type: none"> • the IMG Framework outlines the policies for security of the enterprise IT systems including EIM and the services provided by specialist support entities, such as Wipro • specialist support entities, such as Wipro are subject to annual audits to ISO 27001:2013; • various policies are in place to direct the operation of security access controls: <ul style="list-style-type: none"> ↳ "Password Management Policy", ↳ "Access Control Policy" ↳ "Remote Access Policy" ↳ "Network Security Policy". <p>The "Password Management Policy", November 2017, has password security requirements such as user proof of identity, control of account creation, level of access, login verification by passwords of adequate length and complexity, regular password change, account lockout, password storage security.</p> <p>There was evidence to show that staff access to the IT system was well controlled.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>
7.4	<p>Physical security access controls appear adequate.</p>	<p>The Review found evidence to show that physical security controls appear adequate.</p> <p>The Review found:</p> <ul style="list-style-type: none"> • corporate policies are in place to provide direction on matters of physical access security such as: <ul style="list-style-type: none"> ↳ "Access Control Policy" which restricts access to services and facilities such as sensitive areas, network and client devices; ↳ "Physical Security Policy" which provides the policy to ensure that assets, facilities, and installations are adequately protected from physical threats; 	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<ul style="list-style-type: none"> • Inspection of site facilities showed that the power station area is protected by security fences and monitored gates; within the power station compound different areas such as the evaporation pond are fenced and locked, asset enclosures and offices are also locked. • Perth head office areas are restricted by card access, visitors are required to enter a log and be accompanied by staff. • Critical services such as Wipro IT services are also subject to security policies which control access to sensitive areas of the supplier's facilities. 	
7.5	Data backup procedures appear adequate and backups are tested.	<p>The Review found that there was sufficient evidence to show that data backup is performed and the backup process appears adequate, however the Review did not find an adequate level of written documentation on the backup procedure or adequate evidence of back-up tests.</p> <p>The Review found:</p> <ul style="list-style-type: none"> • the power station CMMS system, MEX is hosted in the "cloud" by the software supplier MEX; MEX is backed up under a contract with an external service provider, Wipro; • the SCADA data is also backed up by the service providers Provident Solution Australia (PSA); • the EIM which includes the Document Management System (DMS) system is backed up under a contract with the external service provider, Wipro; • there was evidence to show that systems had been backed up through examination of back-up logs both for the MEX system and the EIM corporate systems; <input type="checkbox"/> there was limited written information on the back-up regime of the operations SCADA data and of the other corporate services such as SAP (for accounting and financials), e-mail, working files in Sharepoint etc; <input type="checkbox"/> there is no procedure documenting the details of the back-up regime; <input type="checkbox"/> there was no evidence of tests being carried out in a systematic way to verify the integrity of the back-ups; <input type="checkbox"/> there were several diagrams showing the network configuration however no document was available describing the system operation. 	<p>ADEQUACY OF CONTROLS: B Requires some improvement PERFORMANCE: 2 Opportunity for improvement</p> <p>Refer also to Recommendation at EC7.1</p> <p>3. A plan needs to be created documenting the operation of the back-up of the systems supporting the AMS, including for testing and storage of the back-ups. (this plan could be part of the overall plan described in Recommendation at EC7.1).</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
7.6	Key computations related to licensee performance reporting are materially accurate.	<p>The licensee does not have performance reporting obligations in respect of its generation licence.</p> <p>The AMP documents the performance obligations and reporting requirements.</p> <p>Performance reporting for compliance with other requirements are noted in the "Obligations Register", requirements such as environmental emissions tests are carried out regularly by independent contractors.</p>	<p>ADEQUACY OF CONTROLS: NA</p> <p>PERFORMANCE: NR</p>
7.7	Management reports appear adequate for the licensee to monitor licence obligations.	<p>The licensee has in place a process for monitoring compliance with licence obligations.</p> <p>The Review found:</p> <ul style="list-style-type: none"> • the "Obligations Register" has a list of the requirements of applicable Acts, Regulations and Codes, the actions necessary for compliance, responsibilities and timing; the list includes the requirement for reporting against licence obligations; • the "APAK Compliance Report 2017-18 - due diligence report" provides a summary of the requirements of reporting, the reporting process and approval; • the APAK Compliance Report 2017-18 - due diligence report includes the audit of compliance against all the requirements of the licence, as per the ERA's Compliance Manual; • a formal instruction, the "APAK Electricity Generation Licence Reporting Work Instruction" was in preparation during the audit period (and issued after the period) defining the process of preparation, approval and submission of the annual "Compliance Report" to the ERA, subject to the preparation of the internal "Due Diligence Report". 	<p>ADEQUACY OF CONTROLS: A</p> <p>Adequately defined</p> <p>PERFORMANCE: 1</p> <p>Performing effectively</p>
8	Risk Management	An effective risk management framework is applied to manage risks related to the maintenance of service standards.	
8.1	Risk management policies and procedures exist and are being applied to minimise internal and	The Review found that policies and procedure for risk management exist and processes are in place to assess and minimize internal and external risks associated with the AMS.	<p>ADEQUACY OF CONTROLS: A</p> <p>Adequately defined</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
	external risks associated with the asset management system.	<p>The Review found:</p> <ul style="list-style-type: none"> • A "DRAFT AA-GRC-PO04 Risk Management Policy" was available; • At corporate level the Risk Management & Compliance Committee (RMCC) has a charter which requires regular meetings to "periodically review and assess ATCO Australia's risk framework, criteria, and profile, monitor the effectiveness of internal controls and assist the Managing Director in the reporting of risk and compliance matters". • a "RSK-FWK-01 ATCO Australia POS Risk Management Framework" is in place guiding the management of risk across ATCO Australia; • The AMP outlined likely threats to the operation of the assets including, among others, technological risks, resourcing due to remote location, market exposure, financial, contractual, regulatory and political. <p>Evidence of the application of the policy and procedures was found in:</p> <ul style="list-style-type: none"> • the "Current APAK Risk Register-KPS Operating Risk Assessment", a register where both internal and external risks are recorded and analysed, and responsibility, assessment and mitigation of threat are provided. • reports of the risk review biannual meetings are included in the "RMCC Meeting" papers; the reports record changes to the Risk Register and include a compact version of the risk register. 	<p>PERFORMANCE: 1 Performing effectively</p>
8.2	Risks are documented in a risk register and treatment plans are actioned and monitored.	<p>The Review found that a risk register exists and processes are in place to action and monitor risk treatment plans. The risk register was last formally updated on 23 August 2018. The risk register was missing the recording of action closing dates.</p> <p>The Review found that:</p> <ul style="list-style-type: none"> • the "Current APAK Risk Register-KPS Operating Risk Assessment" is a register that records both internal and external risks and their analysis, responsibility for risk management, assessment of likelihood and consequences of failures and mitigation of risk through actions; 	<p>ADEQUACY OF CONTROLS: B Requires some improvement PERFORMANCE: 1 Opportunity for improvement</p> <p>4. (OFI) Review the Risk Register and associated documentation for minor corrections and address the inclusion of due dates for actions and confirmation</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
		<ul style="list-style-type: none"> • the Risk Management Framework guides risk management; • the Risk Management & Compliance Committee (RMCC) has a charter which requires regular meetings to review and assess the company's risks; • the quarterly meetings of the RMCC are recorded in "RMCC Meeting" papers which record changes to the Risk Register (biannually) and include a compact version of the risk register. <p>The Review examined the Risk Register and some of the risk and actions recommended:</p> <ul style="list-style-type: none"> □ The Risk Register does not include actual dates of completion of actions; □ In regard to due dates for completion of actions, there is a 'Target Date' column however all actions except for one are shown as 'ongoing'. By examination it was noted that, for several actions, implementation of the process and its documentation should have implementation dates. <p>The Review examined some of the risk actions which were entered:</p> <ul style="list-style-type: none"> • For Risk 8: "Annual review, testing and regular update of the Crisis Management Plan (CMP) (including Emergency Response Plans (ERP))"; <ul style="list-style-type: none"> (last review of CMP was June 2017, slightly behind; (last update of ERP for KPS was September 2017, satisfactory; (last test of the CMP was in November 2015, findings are noted under EC9.1. <p>There are variations between the Risk Register and the same register included in the RMCC paper of June 2018, final risk rating for risk 14 is 2 and it is 3 in the RMCC paper; this is due to a change in risk rating in the Risk Register subsequent to the RMCC reviews.</p>	<p>of date of closure of actions.</p>
8.3	The probability and consequences of asset failure are regularly assessed.	The Review found that there is a process for assessing the power station operating risks in a risk register however the risk assessment does not drill down to the analysis of failure of plant like transformers, gas heaters, gas conditioning skids etc.	ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<p>The review found:</p> <ul style="list-style-type: none"> • the "Current APAK Risk Register-KPS Operating Risk Assessment" is a register that records both internal and external risks and their analysis, responsibility for risk management, assessment of likelihood and consequences of failures and mitigation of risk through actions; <ul style="list-style-type: none"> (the Risk Register includes assessment of risks related to <ul style="list-style-type: none"> ▪ health, safety, security and environment ▪ fuel supply ▪ compliance ▪ people ▪ insurance ▪ O&M; • there is a process of risk assessment outlined in the Risk Management Framework and in the Risk Management & Compliance Committee (RMCC) charter which results in the biannual review of the Risk Register; • risks are also analysed in the justification of projects carried out with the CEJR form. <p><input type="checkbox"/> The Review noted that the Risk Register risk assessment does not drill down to an analysis of failure of assets like transformers, gas heaters, gas conditioning skids etc.</p>	<p>Performing effectively</p> <p>5. (OFI) Consider the extension of risk assessment to a broader class of assets such as transformers, gas heaters etc.</p>
9	Contingency Planning	Contingency plans have been developed and tested to minimise any significant disruptions to service standards	
9.1	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.	The review found that the licensee has in place a number of contingency plans. There was evidence that showed that emergency response plan tests are designed, however records were not always available of performance of selected tests, findings, resulting corrective actions and their closure.	ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 2

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<p>The Review found that:</p> <ul style="list-style-type: none"> • several plans are in place to deal with crisis and contingencies: <ul style="list-style-type: none"> ↳ "AA-WHS-PLA-002 Crisis Management Plan" (CMP) for response to corporate crisis; ↳ "KPS-RSK-PL-03 Business Continuity Plan" (BCP) ↳ "APAK-WHS-PLA-002 Emergency Response Plan" (ERP) ↳ "APAK-WHS-PLA-008 Pandemic Plan" ↳ "Karratha Power Station Turbine Contingency Plan", August 2014; • the KPS ERP includes handling of emergencies such as: <ul style="list-style-type: none"> ↳ Emergency evacuation and fire drill test procedure ↳ Uncontrolled gas release ↳ High voltage equipment failure ↳ Electrocutation ↳ Fire incidents ↳ Bushfires ↳ Cyclone emergencies. <p>The CMP requires table top (desktop) exercises to be carried out on an annual basis. There was a record of the CMP being tested, according to section 8 and 9 of the report "Crisis Management Team Exercise Held at Mills St November 24th 2015" this was a desktop exercise and incorporated the BCP.</p> <p><input type="checkbox"/> No records were available of further crisis management response / business continuity plan tests since November 2015.</p> <p>The KPS BCP deals with the measures for establishing the capability of the power station to recover from a disaster and resume business operations with the least delay. The plan includes</p>	<p>Opportunity for improvement</p> <p>6. Strengthen the testing and record keeping of the Business Continuity Plan and Emergency Response exercises to ensure that there is a document trail of performance, findings and action completion.</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<p>for activation of the ERP to respond to the incident and then, based on the severity of the incident, to then assess whether a BCP will be required. The plan includes for annual testing however:</p> <ul style="list-style-type: none"> <input type="checkbox"/> No evidence was available to show that a formal annual Business Continuity Plan test had been carried out. The BCP specifies, in regard to 'Electronic Data Restoration Tests', that "at least one annual test will be carried out to verify that the electronic data can be restored using the backup tape/s stored offsite." <p>The Review found that ERP test exercises had been designed:</p> <ul style="list-style-type: none"> • the "APAK Emergency Response Exercise December 2017"; • the "APAK Emergency Response Exercise August 2016"; • There was a report for the December 2017 Emergency Response Exercise tests; <ul style="list-style-type: none"> <input type="checkbox"/> However no documentation was available of the conduct of the August 2016 Emergency Response Exercise test and resulting actions. 	
10	Financial Planning	A financial plan that is reliable and provides for the long-term financial viability of the services.	
10.1	The financial plan states the financial objectives and strategies and actions to achieve the objectives.	<p>The Review found that there is an adequate process of financial planning leading to long range financial plan based on the operational activities, strategies and objectives.</p> <p>The Review found that:</p> <ul style="list-style-type: none"> • there is no document describing the procedure and the process of creating/updating the financial plan however the process is managed through the use of comprehensive spreadsheets which cover the financial model and the O&M plan and are subject to monthly reviews; • APAK employ a "Financial Model" to plan its operation. The Financial Model includes the model assumptions, the operational income and expenditure model, annual financial performance, reporting on monthly performance and forecast up to 2030; 	<p>ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (Findings)	Recommendations
		<ul style="list-style-type: none"> the financial plan is based on the Operational Plan which incorporates the strategies for meeting the customer requirements such as HP generation forecast demand and includes OEM maintenance activities as well as cost of replacement or refurbishment; the Financial Plan tracks performance with a monthly analysis of prior month activities which are then the subject of a monthly meeting; the financial plan and operational plan performance, forecasts and programmed activities are summarised in a Business Plan and reported to higher Management, the Executive, the Director and the Board; the Business Plan include the operational strategy, HSE and financial reporting; locally a presentation is made to the Executive including the financial plan, key asset management criteria, projects. annual Budget Submissions are documented. 	
10.2	The financial plan identifies the source of funds for capital expenditure and recurrent costs.	The financial plan includes an income and expenditure plan which allows for the identification of revenue and both operating and capital costs. As the financial model is based on the PPA, operating costs are covered by the positive cashflow from the revenue from generation. There is sufficient allowance in the cost recovery model to allow for forecast capital expenditure.	ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively
10.3	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets).	<p>The Review found that APAK Financial Model includes projections of operating statements and statements of financial position.</p> <p>The Review found that:</p> <ul style="list-style-type: none"> the APAK Financial Model spreadsheet has a tab for annual financials that go up to 2030 and include projections of cashflow and financial position; there are quarterly financial reviews by auditors of the whole group including the KPS operation; financial statements (including income and expenditure statement and statement of 	ADEQUACY OF CONTROLS: A Adequately defined PERFORMANCE: 1 Performing effectively

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		financial position) are prepared as part of statutory financial reports for the financial year and are externally audited.	
10.4	The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period.	<p>The financial model provides firm predictions of income over the near term and predictions up to 2030.</p> <p>As the model is based on the PPA the revenue parameters are fully defined. A fixed level of charges ensures that fluctuations in demand do not impact significantly on the total revenue.</p> <p>There is a continuous analysis of income through monthly meetings ensuring that variations, if any, are quickly identified and/or predicted.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>
10.5	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services.	<p>The Review found that there was an adequate process for the inclusion of all expenditure in the financial plan.</p> <p>The review found that the financial model is based on the O&M plan and therefore includes for all of the costs associated with the operation and maintenance of the assets. Capital expenditure is identified through operational reports and added to a project list in the O&M plan, once the projects are approved they are added to the financial plan.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>
10.6	Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary.	<p>The Review found that there is a continuous and adequate process to identify and manage variations:</p> <ul style="list-style-type: none"> • monthly meetings highlight any trends and possible variances; • the financial model for the assets is very stable as there is only one contract with one customer; • variances are limited but may happen due to: <ul style="list-style-type: none"> (fluctuations in overseas currency with which the GT maintenance contract is based; (OEM activity, which can cause a deviation from projections; (change in demand from the customer, however this tends to result in reduced or 	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (Findings)	Recommendations
		<p>delayed O&M and lower costs.</p> <p>If variations are expected the Chief Financial Officer will initiate discussion of the variation to identify whether a cost saving can be made, or expenditure can be deferred to allow for increase in the other cost. There is a process for escalating the review if the variation cannot be managed without a drop in revenue and risk assessment where expenditure is postponed.</p> <p>Evidence of the operation of controls was given:</p> <ul style="list-style-type: none"> • in the financial model 'Project YTD' tab, which records the cost of every projects and tracks the expenditure by month which is checked on a monthly basis; • 'memo' 15/11/16 from Station Manager to Financial Manager, CFO and Operation Manager showing the deferral or cancellation of projects and the reasons for changing the discretionary expenditure. 	
11	Capital Expenditure Planning	A capital expenditure plan that provides reliable forward estimates of capital expenditure and asset disposal income, supported by documentation of the reasons for the decisions and evaluation of alternatives and options.	
11.1	There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates.	<p>A capital expenditure (CAPEX) plan is in place and, together with the associated documentation addresses the reasons for expenditures, the options and risks and the proposed timing.</p> <p>The capital expenditure (CAPEX) plan resides in a tab in the financial model. The operating plan has a list of proposed projects, once the projects go through the project approval process they are included in the financial model.</p> <p>The "Capital Expenditure Justification & Request Form" (CEJR) is prepared and is submitted for approval to the required authority level for any capital expenditure. The CEJR form identifies the proponent, it includes assessment of options to address problems, their cost, risk and timing.</p>	<p>ADEQUACY OF CONTROLS: A Documentation meets requirements</p> <p>PERFORMANCE: 1 Performance meets requirements</p>

EC No.	AMS Element / Criteria	Review summary (□ Findings)	Recommendations
11.2	The plan provides reasons for capital expenditure and timing of expenditure.	<p>The documentation associated with the Financial Model/CAPEX plan provides the reasons and the details of capital expenditure such as timing;</p> <ul style="list-style-type: none"> • CAPEX has to be justified and approved through the “Capital Expenditure Justification and Request Form” (CEJR). This form includes for: <ul style="list-style-type: none"> └ description of issues and reasons for expenditure; └ alternative solutions, costs and risk; └ time frame for projects. <p>Evidence of CEJRs was reviewed including:</p> <ul style="list-style-type: none"> • project for “Stairways and Access Ladders”, planned for December 2017 to December 2018; • project for “SCADA System Upgrade”, planned for July 2014 to March 2015. 	<p>ADEQUACY OF CONTROLS: A Documentation meets requirements</p> <p>PERFORMANCE: 1 Performance meets requirements</p>
11.3	The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan.	<p>The Financial Model and the included CAPEX plan are based on the O&M Plan and therefore consistent with the assets condition identified in the plan.</p> <p>Outage data for 2021 was reviewed and showed that planned capital expenditure had been allowed in the Financial Model in accordance with the O&M Plan.</p>	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>
11.4	There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned.	<p>The Review found that the Financial Model and the included CAPEX plan are subject to continuous review through the monthly meetings.</p> <p>The review found that:</p> <ul style="list-style-type: none"> • there is a continuous process to identify and manage cost variations in the Financial Model, monthly meetings highlight any trends and possible variances; • cost of projects are recorded in the Financial Model ‘Project YTD’ tab, which tracks the expenditure by month and is checked on a monthly basis; • the Review examined a memo 15/11/16 from the Station Manager to the Financial Manager, CFO and Operation Manager showing the deferral or cancellation of projects 	<p>ADEQUACY OF CONTROLS: A Adequately defined</p> <p>PERFORMANCE: 1 Performing effectively</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		and the reasons for changing CAPEX discretionary expenditure.	
12	Review of AMS	Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency.	
12.1	A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current.	<p>The Review found that a review process was in place to keep the AMP current. The AMP appears to be at a mature stage and addresses adequately most of the components of the AMS as defined in the ERA’s model however the documentation of the AMP and AMS review process needs improvement.</p> <p>The AMP and the asset management system review process has undergone changes during the audit period:</p> <ul style="list-style-type: none"> during the audit period the AMP received two internal reviews, one in 2014 (appears to have been limited to roles and responsibilities) and one in 2018, and one update following an external review in 2018. <p>The AMP defines an improvement regime:</p> <ul style="list-style-type: none"> in the improvement section the AMP states that the “asset management plan will be audited annually to check its level of compliance with the generation licence conditions... this plan will also be reviewed during budget preparation and amended accordingly”. <p>It is noted that the AMP/AMS are also subject to the external reviews required by the licence at interval specified by the ERA.</p> <p>The Review noted that, as far as ensuring that the “asset management plan and the asset management system described therein are kept current” as per the Effectiveness Criteria:</p> <ul style="list-style-type: none"> In discussion with the Senior Manager Operations & Engineering and the Manager, Governance and Compliance it was found that APAK has a long range outage planner and has a dispatch factor in the financial model which takes into account changes in competition and the prospect of lower demand. <p><input type="checkbox"/> The extent of peer review of the AMP/AMS was not clear:</p>	<p>ADEQUACY OF CONTROLS: B Requires some improvement PERFORMANCE: 2 Opportunity for improvement</p> <p>7. Documentation of the process of review of the AMP and AMS needs to be improved possibly with the creation of a defined process;</p> <p>7.1. the scope of the review needs to include all aspects of the AMS including, for example, all of the IT systems supporting the AMS, including but not limited to the financials, accounting, training and the reliability of back-ups and back-up testing.</p> <p>7.2. the engagement of other internal specialist/functions should assist with widening and optimising the scope and analysis within the AMP to cover all of the AMS elements;</p> <p>7.3. separate external independent review, by internal audit or other external specialist, needs also address the whole of the</p>

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
		<p><input type="checkbox"/> The Review identified areas of the AMP that could benefit from reviews by a wider internal forum to strengthen the assessment of external factors such as the prospect of lower demand due to competition from other generation which has not been discussed in the AMP (trends of demand have not been explicitly analysed in the AMP) and which could result in lower efficiency and the need for strategies to address this.</p> <p><input type="checkbox"/> As observed at EC1.9, the AMP notes that “the [Pilbara] region is experiencing a sustained period of significant growth and cost pressure is high for both materials and labour in Western Australia”. Whilst this was true of the period up to possibly 2010-11, recently the growth has been limited and the labour market flat:</p> <p><input type="checkbox"/> The Review noted that there is no documented procedure on the review of the AMS and AMP, the AMP offers conflicting statements on review frequency and reviewers:</p> <p><input type="checkbox"/> the AMP states that it will be reviewed and updated every two years however in the section 6.3 on monitoring it also states that “This plan will also be reviewed during budget preparation and amended accordingly”, which implies an annual review;</p> <p><input type="checkbox"/> in section 1.4 the AMP states that the ERA reviews will take place at 24 months intervals but in section 6.3 at 48 months intervals;</p> <p><input type="checkbox"/> as noted in section 1.1 of the AMS Review, the process of AMP review is not clear, it is treated in a number of sections and it is not clear if the reviews are the ones required by the licence and legislation or internally driven by the licensee.</p> <p>The Review found the following:</p> <p><input type="checkbox"/> There is not a clear review in the AMP of recent asset operational history; lessons learnt, trends in asset performance, demand and external factors are not identified in a separate section to highlight the importance of change.</p> <p>The Review noted that:</p> <p><input type="checkbox"/> The AMP/AMS review process needs to ensure that the internal review is done more systematically.</p>	<p>elements of the AMS and is to be carried out at planned intervals.</p> <p>8. The AMP needs to be revised to clarify or remove the conflicting review statements (e.g. sections 1.1, 1.4 and 6.3).</p> <p>9. The AMP needs to become part of the planning process.</p> <p>9.1. Lessons learnt need to be part of the improvement process and appropriate content, including up-to-date trends included in the AMP (including at least performance, demand and other external factors), possibly in a separate section to highlight the importance of change.</p>
12.2	Independent reviews (e.g. internal	The Review found that an external review was carried out on the AMP.	ADEQUACY OF CONTROLS: B

EC No.	AMS Element / Criteria	Review summary (<input type="checkbox"/> Findings)	Recommendations
	<p>audit) are performed of the asset management system.</p>	<p>An external review of the AMP was carried out during the audit period, following one of the findings and recommendations of the AMS Review 2014. The recommendation from the 2014 audit resulted in the following corrective actions:</p> <ul style="list-style-type: none"> • "the AMS to be subject to independent reviews on a regular basis" and • "register or record to capture the reviews conducted on its AMS and the independence of the associated reviewer". <p>The Review found that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The AMP states that an external independent review will be carried out by an independent expert, this requirement corresponds to the prescribed requirements of the licence and legislation. <ul style="list-style-type: none"> (In accordance with the Effectiveness Criteria EC12.2 the AMP should give specific directions for separate independent reviews of the AMS which could be performed by ATCO's internal audit or by external specialists. <p>The Review noted that:</p> <ul style="list-style-type: none"> • The scope of independent review should cover the whole of the elements of the AMS, including, among others, the IT systems supporting the AMS, including the financials, accounting, training and the reliability of back-ups and back-up testing. 	<p>Requires some improvement</p> <p>PERFORMANCE: 1</p> <p>Performing effectively</p> <p>Recommendations are made at EC12.1.</p>

3 CHANGES TO THE LICENCE

No changes to the licence conditions are recommended in respect of the Asset Management System review.

4 RECOMMENDATIONS

4.1 CURRENT REVIEW ASSET SYSTEM DEFICIENCIES/RECOMMENDATIONS

Recommendations on the actions to be taken by the licensee to address process deficiencies are listed in Table 7 and Table 8.

Table 7-Current Review Asset System Deficiencies / Recommendations (Resolved)

Table of Current Review Asset System Deficiencies/ Recommendations				
A. Resolved during current Review period				
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Date Resolved (& management action taken)	Auditors Comments
		No actions resolved during current review period.		

Table 8- Current Review Asset System Deficiencies / Recommendations (Unresolved)

Table of Current Review Asset System Deficiencies/ Recommendations				
B. Unresolved during current Review period				
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation	Management action taken by end of Review period
1	1.1	B2 Asset Planning Asset management plan covers key requirements. The process of AMP review described in the AMP is not clear, it is discussed in a number of sections and it is not clear if the reviews are the ones required by the licence and	Recommendations on review, planning, AMP and AMS are made under EC12.1	

Table of Current Review Asset System Deficiencies/ Recommendations				
B. Unresolved during current Review period				
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation	Management action taken by end of Review period
		<p>legislation or internally driven by the licensee.</p> <p>The AMS review process needs to be clarified.</p> <p>The review of recent past history and trends in the areas listed below does not appear to be addressed and those changes identified as current drivers:</p> <ul style="list-style-type: none"> ◦ asset performance (say operation over the last review period), ◦ in demand (past trends and forecast) and ◦ changes in external factors. 		
2	1.2	<p>B1</p> <p>Asset Planning</p> <p>Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning.</p> <p>In regard to asset management the Review found that, while there is a simplified planning process diagram for future use in the AMP, there is no formal procedure or a more detailed definition of the planning cycle, for example it is not clear how the strategies are defined from year to year, how they are captured in the AMP and the extent of any peer review of strategies and plans.</p>	Recommendations on planning and AMP are made under EC12.1	
3	1.9	<p>B2</p> <p>Asset Planning</p> <p>Plans are regularly reviewed and updated.</p> <p>The AMP is not clear about the frequency of reviews or the extent of internal peer reviews.</p> <p>The currency of the analysis in the AMP is not clear. In regard to the</p>	Recommendations on review and AMP are made in EC12.1	

Table of Current Review Asset System Deficiencies/ Recommendations				
B. Unresolved during current Review period				
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation	Management action taken by end of Review period
		currency of the AMP review there are some inconsistencies in the analysis of external factors. The AMP notes that "the region is experiencing a sustained period of significant growth and cost pressure is high for both materials and labour in Western Australia". Whilst this was true of the period up to possibly 2010-11, recently the growth has been limited and the labour market flat: this has not been noted in the AMP.		
4	4.4	<p>A1 Environmental Analysis Achievement of customer service levels.</p> <p>The AMP does not specify the limits for supply interruption service levels, nor includes definitions of what permitted supply interruptions are, or unauthorised supply interruptions, which are all part of the objectives of the operation of the plant and govern the operation policy. The only reference made is to the Power Purchase Agreement (PPA) which is a confidential document.</p>	1/2018 (OFI) Review AMP for the inclusion of defined customer service levels and historical performance of plant against service levels.	
5	7.1	<p>B2 Asset Management Information System Adequate system documentation for users and IT operators.</p> <p>The Information Management Governance Framework does not provide a definition of the scope of the systems employed (for example there is no definition of what SAP contains, e-mail system policy/ operation and back-up etc), or of the processes such as the back-up process and testing, this is left to the support services organisation.</p>	<p>2/2018 Review and identify the gaps in IT system documentation supporting the AMS:</p> <p>2.1. Create a document defining the scope of the different IT systems supporting the AMS, including the scope, operation and interaction (if any) of the systems.</p>	

Table of Current Review Asset System Deficiencies/ Recommendations				
B. Unresolved during current Review period				
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation	Management action taken by end of Review period
		As no documentation is available to define the processes there is a gap in the documentation and definition of the system operation.		
6	7.5	<p>B2</p> <p>Asset Management Information System</p> <p>Data backup procedures appear adequate and backups are tested.</p> <p>There was limited written information on the back-up regime of the operations SCADA data and of the other corporate services such as SAP (for accounting and financials), e-mail, working files in Sharepoint etc.</p> <p>There is no procedure documenting the details of the back-up regime.</p> <p>There was no evidence of tests being carried out in a systematic way to verify the integrity of the back-ups;</p>	<p>3/2018</p> <p>A plan needs to be created documenting the operation of the back-up of the systems supporting the AMS, including for testing and storage of the back-ups. (this plan could be part of the overall plan described in Recommendation at EC7.1).</p>	
7	8.2	<p>B1</p> <p>Risk Management</p> <p>Risks are documented in a risk register and treatment plans are actioned and monitored.</p> <p>The Risk Register does not include actual dates of completion of actions.</p> <p>In regard to due dates for completion of actions, there is a 'Target Date' column however all actions except for one are shown as 'ongoing'. By examination it was noted that, for several actions, implementation of the process and its documentation should have implementation dates.</p>	<p>4/2018</p> <p>(OFI) Review the Risk Register and associated documentation for minor corrections and address the inclusion of due dates for actions and confirmation of date of closure of actions.</p>	
8	8.3	<p>A1</p> <p>Risk Management</p> <p>The probability and consequences of</p>	<p>5/2018</p> <p>(OFI) Consider the extension of risk assessment to a broader class of assets such as transformers, gas heaters etc.</p>	

Table of Current Review Asset System Deficiencies/ Recommendations				
B. Unresolved during current Review period				
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation	Management action taken by end of Review period
		<p>asset failure are regularly assessed.</p> <p>The Risk Register risk assessment does not drill down to an analysis of failure of assets like transformers, gas heaters, gas conditioning skids etc.</p>		
9	9.1	<p>A2</p> <p>Contingency Planning</p> <p>Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.</p> <p>No records were available of further crisis management response / business continuity plan tests since November 2015.</p> <p>No evidence was available to show that a formal annual Business Continuity Plan (BCP) test had been carried out. The BCP specifies, in regard to 'Electronic Data Restoration Tests', that "at least one annual test will be carried out to verify that the electronic data can be restored using the backup tape/s stored offsite."</p> <p>No documentation was available of the conduct of the August 2016 Emergency Response Exercise test and resulting actions.</p>	<p>6/2018 Strengthen the testing and record keeping of the Business Continuity Plan and Emergency Response exercises to ensure that there is a document trail of performance, findings and action completion.</p>	
10	12.1	<p>B2</p> <p>Review of AMS</p> <p>A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current.</p> <p>The extent of peer review of the AMP/AMS was not clear.</p> <p>Areas of the AMP could benefit from</p>	<p>7/2018 Documentation of the process of review of the AMP and AMS needs to be improved possibly with the creation of a defined process;</p> <p>7.1. the scope of the review needs to include all aspects of the AMS including, for example, all of the IT systems supporting the AMS, including but not limited to the financials, accounting, training and the reliability of back-ups and back-</p>	

Table of Current Review Asset System Deficiencies/ Recommendations				
B. Unresolved during current Review period				
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation	Management action taken by end of Review period
		<p>reviews by a wider internal forum to strengthen the assessment of external factors such as the prospect of lower demand due to competition from other generation which has not been discussed in the AMP (trends of demand have not been explicitly analysed in the AMP) and which could result in lower efficiency and the need for strategies to address this.</p> <p>The AMP notes that “the [Pilbara] region is experiencing a sustained period of significant growth and cost pressure is high for both materials and labour in Western Australia”. Whilst this was true of the period up to possibly 2010-11, recently the growth has been limited and the labour market flat.</p> <p>There is no documented procedure on the review of the AMS and AMP; the AMP offers conflicting statements on review frequency and reviewers.</p> <p>There is not a clear review of recent asset operational history; lessons learnt, trends in asset performance, demand and external factors.</p>	<p>up testing.</p> <p>7.2. the engagement of other internal specialist/functions should assist with widening and optimising the scope and analysis within the AMP to cover all of the AMS elements;</p> <p>7.3. separate external independent review, by internal audit or other external specialist, needs also address the whole of the elements of the AMS and is to be carried out at planned intervals.</p> <p>8/2018 The AMP needs to be revised to clarify or remove the conflicting review statements (e.g. sections 1.1, 1.4 and 6.3).</p> <p>9/2018 The AMP needs to become part of the planning process.</p> <p>9.1. Lessons learnt need to be part of the improvement process and appropriate content, including up-to-date trends included in the AMP (including at least performance, demand and other external factors), possibly in a separate section to highlight the importance of change.</p>	
11	12.2	<p>B1</p> <p>Review of AMS</p> <p>Independent reviews (e.g. internal audit) are performed of the asset management system.</p> <p>The AMP states that an external independent review will be carried out by an independent expert, this requirement corresponds to the prescribed requirements of the licence and legislation.</p> <p>In accordance with the Effectiveness Criteria EC12.2 the AMP should give specific directions for separate independent reviews of the AMS which could be performed by ATCO's</p>	Recommendations are made at EC12.1	

Table of Current Review Asset System Deficiencies/ Recommendations				
B. Unresolved during current Review period				
Item No	EC Ref	Rating / AMS Component Effectiveness Criteria / Details of Deficiency	Auditors' Recommendation	Management action taken by end of Review period
		internal audit or by external specialists.		

5 POST REVIEW IMPLEMENTATION PLAN

The Post Review Implementation Plan (PRIP) is a separate document that, if applicable, will be prepared by the licensee in response to the recommendations made in the review. As it represents the licensee's views and actions, it does not form part of the review report, however it includes all key review findings and recommendations that have been made in the review. For each recommendation the licensee records responses and corrective actions, responsibility for the actions and a proposed date for completion.

Appendix A - Documentation reviewed

Key Documentation Reviewed

1. Electricity Generation Licence EGL21
2. Electricity Generation Licence Performance Audit 2014
3. Review Report 2014
4. Post Audit Implementation Plan 2014 - Status
5. ERA Generation Licence Compliance Procedure
6. APAK Compliance Report 2017-18 - due diligence report
7. ERA letter noting receipt of Compliance Report
8. Economic Regulation Authority Letters on Status of Post Audit Implementation Plan 2014
9. Updated Post-Audit and Post-Review Implementation Plan – 2015
10. Asset Management Plan
11. Power Purchase Agreement extract
12. Power Plant Service Agreement
13. Operating Protocol between APAK and Horizon Power (2009)
14. HPCO ATCO – HP Operating Protocol Revision 4 (Draft, April 2018)
15. Financial Model and Plan
16. APAK Budget Papers
17. Licence fee payments
18. Audited Reports
19. Property, Plant & Equipment Process.
20. O&M Plan
21. CEJR Stairways, Access ladders and platforms, December 2017;
22. CEJR Civil and Structure Work for Major Outage, November 2016;
23. CEJR SCADA System Upgrade, October 2014
24. Wonderware Factory Acceptance Testing 8514-IRS report
25. Emissions Testing - Karratha Power Station
26. APAK and Horizon Power - Quarterly Operational Communication Meeting Reports
27. KPS Status Reports
28. KPS Monthly Report
29. Current APAK Risk Register-KPS Operating Risk Assessment
30. RMCC Meeting papers
31. 10.c 2017 - HP Supply Constraints Register
32. Horizon Power Supply Constraint Notifications
33. Standard Operating Procedures

34. Operational Events Report Register
35. GTG1 Vent Fan Drive Relay Module Fault report, April 2018
36. ER20180510 - GTG2 Trip due to system disturbance. 125VDC system fault
37. ATCO Power Karratha Event Report Form
38. Plant Event Report To Horizon Power
39. APAK Station metering and measurement manual
40. Engineering Services Report (GTG2), June 2017
41. DRAFT AA-GRC-PO04 Risk Management Policy
42. RSK-FWK-01 ATCO Australia POS Risk Management Framework
43. Crisis Management Team Exercise Held at Mills St November 24th 2015