

Alinta Cogeneration Pinjarra Pty Ltd

**Electricity Generation Licence
(EGL10)**

**2017 Asset Management
System Review Report**

December 2017



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11 December 2017

Dear Steve

**Alinta Cogeneration Pinjarra Pty Ltd Electricity Generation Licence (EGL 10) –
2017 Asset Management System review report**

We have completed the Electricity Generation Licence Asset Management System review for Alinta Cogeneration Pinjarra Pty Ltd for the period 1 July 2013 to 30 June 2017 and are pleased to submit our report to you.

I confirm that this report is an accurate presentation of the findings and conclusions from our review procedures.

If you have any questions or wish to discuss anything raised in the report, please contact Andrew Baldwin on 0414 924 346 or me on 0411 603 644.

Yours sincerely

Richard Thomas _____
Partner
Deloitte Risk Advisory Pty Ltd

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1 Independent Reviewer's report

With the approval of the Economic Regulation Authority (the **ERA**), Alinta Cogeneration Pinjarra Pty Ltd (**Alinta Pinjarra**) engaged Deloitte Risk Advisory Pty Ltd (**Deloitte**) to conduct a review of the effectiveness of Alinta Pinjarra's Asset Management System (**AMS**) relating to its Electricity Generation Licence No.6 (EGL 10) (the **Licence**) for the period 1 July 2013 to 30 June 2017 (**review period**). Deloitte engaged KT & Sai Associates Pty Ltd to provide advice where technical expertise was required. Deloitte conducted the review as a limited assurance engagement.

Alinta Pinjarra's responsibility for maintaining an effective AMS

Alinta Pinjarra is responsible for establishing and maintaining an effective AMS for the assets subject to the License as measured by the effectiveness criteria in the Guidelines. This responsibility includes implementing and maintaining policies, procedures and controls, which are designed to provide for an effective AMS for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines.

Deloitte's responsibility

Our responsibility is to express a conclusion, based on our procedures, on the effectiveness of Alinta Pinjarra's AMS for assets subject to the Licence. The limited assurance engagement has been conducted in accordance with the Australian Standard on Assurance Engagements (**ASAE**) *3500 Performance Engagements* issued by the Australian Auditing and Assurance Standards Board, in order to state whether, in all material respects, based on the work performed, anything has come to our attention to indicate that Alinta Pinjarra had not established and maintained an effective AMS for assets subject to the Licence, as measured by the effectiveness criteria in the April 2014 issue of the *Audit and Review Guidelines: Electricity and Gas Licences* issued by the ERA (the **Guidelines**) and in operation during the review period.

ASAE 3500 also requires us to comply with the relevant ethical requirements of the Australian professional accounting bodies.

Our procedures consisted primarily of:

- Utilising the Guidelines as a guide for development of a risk assessment and document review to assess controls
- Development of a Review Plan for approval by the ERA and an associated work program
- Interviews with and representations from relevant Alinta Pinjarra staff to gain an understanding of the development and maintenance of policies and procedural type documentation
- Examination of documented policies and procedures for key functional requirements and consideration of their relevance to Alinta Pinjarra's AMS requirements and standards
- Physical visit to Alinta Pinjarra's operations site
- Consideration of reports and references evidencing activity
- Consideration of the installation's function, normal modes of operation and age
- Reporting of findings to Alinta Pinjarra for review and response.

Limitations of use

This report is made solely for the information and internal use of Alinta Pinjarra and is not intended to be, and should not be, used by any other person or entity. No other person or entity is entitled to rely, in any manner, or for any purpose, on this report.

We understand that a copy of the report will be provided to the ERA for the purpose of reporting on the effectiveness of Alinta Pinjarra's AMS. We agree that a copy of this report may be provided to the ERA for its information in connection with this purpose but only on the basis that we accept no duty, liability or responsibility to the ERA in relation to the report. We accept no

duty, responsibility or liability to any party, other than Alinta Pinjarra, in connection with the report or this engagement.

Inherent limitations

A limited assurance engagement is substantially more limited in scope than a reasonable assurance engagement conducted in accordance with ASAE 3500 and consequently does not allow us to obtain assurance that we would become aware of all significant matters that might be identified in a reasonable assurance engagement. Accordingly, we will not express an opinion providing reasonable assurance.

Because of the inherent limitations of any compliance procedure, it is possible that fraud, error or non-compliance may occur and not be detected. We cannot, in practice, examine every activity and procedure, nor can we be a substitute for management's responsibility to maintain adequate controls over all levels of operations and its responsibility to prevent and detect irregularities, including fraud. Accordingly, readers of our reports should not rely on the report to identify all potential instances of AMS deficiencies, which may occur.

Any projection of the evaluation of the effectiveness of AMS processes and procedures to future periods is subject to the risk that the processes and procedures may become inadequate because of changes in conditions, or that the degree of compliance with management procedures may deteriorate.

Independence

In conducting our engagement, we have complied with the independence requirements of the Australian professional accounting bodies.

Conclusion

Based on our work described in this report, in all material respects, nothing has come to our attention to indicate that Alinta Pinjarra had not established and maintained an effective AMS for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines and in operation during the period 1 July 2013 to 30 June 2017.

Table 3 of this report provides the effectiveness ratings for each of the 12 key processes in the asset management life-cycle assessed by this engagement. For those aspects of Alinta Pinjarra's AMS that were assessed as having opportunities for improvement, relevant observations, recommendations and action plans are summarised at section 2.4 of this report and detailed at section 4 of this report.

DELOITTE RISK ADVISORY PTY LTD

Richard Thomas _____
Partner
Perth, 11 December 2017

2 Executive summary

2.1 Introduction and background

The Economic Regulation Authority (the **ERA**) has under the provisions of the Electricity Industry Act 2004 (**Electricity Act**), issued to Alinta Cogeneration Pinjarra Pty Ltd (**Alinta Pinjarra**) the Electricity Generation Licence No.10 (EGL10) (**the Licence**).

Section 14 of the Act requires Alinta Pinjarra to provide to the ERA an asset management system (**AMS**) review (the **review**) conducted by an independent expert acceptable to the ERA not less than once in every 24 month period (or any longer period that the ERA allows). The ERA set the period to be covered by the review as 1 July 2013 to 30 June 2017 (**review period**).

At the request of Alinta Pinjarra, Deloitte Risk Advisory Pty Ltd (**Deloitte**) has undertaken a limited assurance review of Alinta Pinjarra's AMS.

The Licence relates to Alinta Pinjarra's operation of electricity generating works at its Pinjarra cogeneration facilities, which supply electricity to the South West Interconnected System (**SWIS**).

The Pinjarra Power Station is a 285MW gas fuelled cogeneration plant located at Alcoa of Australia Ltd.'s (**Alcoa**) Pinjarra refinery in South-West WA. The Pinjarra Power Station operates as a base load power station. Alinta Pinjarra has established an Operations and Maintenance Agreement (**O&M Agreement**) with Alcoa for Alcoa to manage, operate and maintain the power station on Alinta Pinjarra's behalf.

The review has been conducted in accordance with the April 2014 issue of the *Audit and Review Guidelines: Electricity and Gas Licences* (the **Guidelines**), which sets out 12 key processes in the asset management life-cycle. The limited assurance review was undertaken in order to state whether, based on the work performed, in all material respects, anything has come to our attention to indicate that Alinta Pinjarra had not established and maintained an effective AMS for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines and in operation during the period 1 July 2013 to 30 June 2017.

2.2 Findings

In considering Alinta Pinjarra's internal control procedures, structure and environment, its compliance arrangements and its information systems specifically relevant to those effectiveness criteria subject to review, we observed that:

- Throughout the period subject to review, Alinta Pinjarra had maintained consistent procedures and controls within its AMS
- Alinta Pinjarra has an ongoing effective working arrangement with Alcoa, which has an established asset management framework in place, contributing to the overall effective performance of the plant
- Alinta Pinjarra staff appeared to have a good understanding of their roles, particularly displaying an understanding of the asset management processes within their area of responsibility
- Alinta Pinjarra has a small number of further opportunities to strengthen aspects of its AMS, as described throughout this report.

This review assessed that, of the 56 elements of Alinta Pinjarra's AMS:

- For the asset management process and policy definition adequacy ratings:
 - 51 are rated as "Adequately defined"
 - Four are rated as "Requires some improvement"
 - One is not rated
- For the asset management performance ratings:
 - 48 are rated as "Performing effectively"
 - Seven are rated as "Opportunity for improvement"
 - One is not rated
- There are a total of seven observations (across eight elements) where further action is recommended.

Specific assessments for each criterion are summarised at **Table 3** in section 3 "Summary of ratings" of this report.

Detailed findings, including relevant observations, recommendations and action plans are located in section 4 "Detailed findings, recommendations and action plans" of this report.

2.3 Alinta Pinjarra's response to previous review recommendations

This review considered how Alinta Pinjarra has progressed against the six outstanding action items from the 2013 and 2010 reviews.

Based on our examination of relevant documents, discussion with staff and consideration of the results of this review's testing against the criteria, of the six action plans identified:

- Alinta Pinjarra has closed out five action plans, of which:
 - Three require no further action:
 - *Incorporation of OEM drawings for Unit 2 into Alcoa's maintenance drawings*
 - *Installation Unit 2 analyser*
 - *Formal review and update of AMP*
 - Two were actioned in August 2017, after the end of the review period:
 - *Both relating to finalisation of the site Compliance Manual*
- One has not yet been actioned:
 - *Independent review of Asset Management System.*

Refer to section 5 of this report for further detail.

2.4 Recommendations and action plans

A. Resolved at end of current review period

Not applicable.

B. Unresolved at end of current review period

| AMS Key Process and Effectiveness Criteria | Adequacy rating | Issue 1/2017 |
|--|--|---|
| Asset planning 1(a) Asset management plan covers key requirements | Requires some improvement (B) | Although the Alinta Energy Pinjarra Cogeneration Plant – Asset Management Plan FY2018 - FY2022 (AMP) generally reflects Alinta Pinjarra’s expectations and requirements for managing its generation assets, the AMP can be further improved as it does not clearly address the following elements expected by Alinta Energy’s Asset Management Framework: <ul style="list-style-type: none"> Contingency plans designed to mitigate the business impact of incidents or emergencies arising as a result of realised asset related risks A brief description of any known and significant risks relating to assets Consideration and documentation of legal and compliance requirements. |
| | Performance rating Opportunity for improvement (2) | |
| Recommendation 1/2017 Alinta Pinjarra update its AMP to explicitly incorporate the following elements of its Asset Management Framework and EGL obligations: <ul style="list-style-type: none"> Contingency plans Known and significant risks relating to key assets Legal and compliance requirements. | | Action Plan 1/2017 Alinta Pinjarra will update its AMP to explicitly incorporate the following elements of its Asset Management Framework and EGL obligations: <ul style="list-style-type: none"> Contingency plans Known and significant risks relating to key assets Legal and compliance requirements. Responsible Person: Head of Asset Management Target Date: August 2018 |

| AMS Key Process and Effectiveness Criteria | Adequacy rating | Issue 2/2017 |
|--|---|---|
| Environmental Analysis 4(c) Compliance with statutory and regulatory requirements. | Requires some improvement (B) | In response to a finding of the previous (2013) AMS review that Alinta Pinjarra’s site Compliance Manual remained in draft form, Alinta Pinjarra devised an action plan for the Manual to be reviewed and finalised. As the Manual had not been formally reviewed and approved as a final document as at 30 June 2017, the issue and action plan remained outstanding for the purpose of this review. In August 2017, the Compliance Manual was reviewed and updated to reflect the current legal, safety and environmental obligations relating to Alinta Pinjarra’s operations. <i>No further action is required.</i> |
| | Performance rating Performing effectively (1) | |
| Recommendation 2/2017 Not applicable – the necessary corrective action was taken in August 2017. | | Action Plan 2/2017 Complete – August 2017. |

| AMS Key Process and Effectiveness Criteria | Adequacy rating | Issue 3/2017 |
|--|---|--|
| <p>Asset Operations 5(a) Operational policies and procedures are documented and linked to service levels required</p> <p>Asset Maintenance 6(a) Maintenance policies and procedures are documented and linked to service levels required</p> | <p>Adequately defined (A)</p> <p>Performance rating</p> <p>Opportunity for improvement (2)</p> | <p>In 2014, NEM Energy [heat recovery steam generator (HRSG) manufacturer] was commissioned by Alinta Pinjarra to design and implement major modifications to the Plant's cogeneration units to improve steam production capacity at low GT Loads.</p> <p>The updated drawings relating to those modifications are not yet fully integrated into the O&M system managed by Alcoa on Alinta Pinjarra's behalf.</p> |
| <p>Recommendation 3/2017</p> <p>Alinta Pinjarra work with Alcoa to ensure updated drawings of the modified HRSG units are fully integrated within the O&M system.</p> | | <p>Action Plan 3/2017</p> <p>Alinta Pinjarra will work with Alcoa to ensure updated drawings of the modified HRSG units are fully integrated within the O&M system.</p> <p>Responsible Person: Head of Asset Management and Alcoa WA Operations CoGen Supervisor</p> <p>Target Date: June 2018</p> |

| AMS Key Process and Effectiveness Criteria | Adequacy rating | Issue 4/2017 |
|--|--|--|
| <p>Asset Maintenance</p> <p><i>6(e) Risk management is applied to prioritise maintenance tasks</i></p> <p>Risk management</p> <p><i>8(a) Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system</i></p> | <p>6(e) Adequately defined (A)</p> <p>8(a) Requires some improvement (B)</p> <hr/> <p>Performance rating</p> <hr/> <p>Opportunity for improvement (2)</p> | <p>Alinta Pinjarra applies the Alinta Energy group-wide risk management framework across its asset management activities. Alcoa also applies a structured, risk based approach to its O&M activities, performed in accordance with the O&M Agreement.</p> <p>However, Alinta Pinjarra has not yet captured clear evidence of some of those risk management activities to demonstrate that its risk management philosophies and approach are consistently applied. For example:</p> <ul style="list-style-type: none"> • A consistent approach and timeframe has not been designed for preparing and reviewing risk treatment plans and reports, other than through the annual review of the AMP • The AMP does not provide a clear and consistent reference to specific risk assessment and management activities, including preparation of risk treatment plans (which often result in allocation of capital expenditure) and links to insurer risk reduction recommendations. For example, in relation to Alinta Pinjarra’s decision to extend the Unit 1 critical rotor inspection to be delayed until the 3rd major inspection in 2023, the impact of that decision (e.g. on other maintenance activity and cost forecasts) had not been reflected in Alinta Pinjarra’s records of the risks associated with the Unit 1 gas turbine rotor prior to and subsequent to the decision • The Pinjarra site risk register does not capture all risk elements identified through the contingency planning process (refer to Issue 5/2017) or the insurer risk reduction recommendations. <p>In relation to <i>6(e) Risk management is applied to prioritise maintenance tasks</i>:</p> <ul style="list-style-type: none"> • In relation to the major inspection of a “U1 Gas Turbine Rotor” initially scheduled for November/December 2017 and classified in the AMP as a medium risk, Alinta Pinjarra engaged MHI to assess whether the major inspection could be delayed. In April 2016, MHI concluded that it was possible for the critical rotor inspection to be delayed until the 3rd major inspection scheduled for 2023, enabling Alinta Pinjarra to make a decision not to purchase a replacement rotor. Although Alinta Pinjarra had demonstrated its assessment of risk in prioritising maintenance tasks, the impact of that decision had not been reflected in Alinta Pinjarra’s records of the risks and related treatments associated with the Unit 1 gas turbine rotor prior to and subsequent to the decision. |

| | |
|--|--|
| <p>Recommendation 4/2017</p> <p>Alinta Pinjarra:</p> <p>(a) Establish a clear approach and timeframe for assessing risks, implementing treatment plans and monitoring status on a more frequent basis than the annual review of the AMP</p> <p>(b) Further develop its site Risk Register to include all risk elements relevant to its management of the power station assets, including the contingency planning process and insurer risk reduction recommendations.</p> | <p>Action Plan 4/2017</p> <p>Alinta Pinjarra will:</p> <p>(a) Establish a clear approach and timeframe for assessing risks, implementing treatment plans and monitoring status on a more frequent basis than the annual review of the AMP</p> <p>(b) Further develop its site Risk Register to include all risk elements relevant to management of the power station assets, including the contingency planning process and insurer risk reduction recommendations.</p> <p>Responsible Person: Head of Asset Management and Alcoa WA Operations CoGen Supervisor</p> <p>Target Date: March 2018</p> |
|--|--|

| AMS Key Process and Effectiveness Criteria | Adequacy rating | Issue 5/2017 |
|--|---|---|
| <p>Contingency Planning</p> <p><i>9(a) Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks</i></p> | <p>Requires some improvement (B)</p> <p>Performance rating</p> <p>Opportunity for improvement (2)</p> | <p>As Alinta Pinjarra’s contingency plans and arrangements are currently maintained/described in different processes and documents, it has the opportunity to further ensure the completeness and consistency of its contingency planning arrangements by capturing all of its plans and processes in one single reference. Such an approach would be consistent with Alinta Energy’s Asset Management Framework.</p> |
| <p>Recommendation 5/2017</p> <p>Alinta Pinjarra:</p> <p>(a) Establish a formal process for ensuring that contingency arrangements in place for all key risks to the power station’s operations and availability (such as fuel and water supply) are rigorously challenged and tested</p> <p>(b) Prepare a clear overarching “umbrella” document to capture all contingency plans in place for each of the key risks to Alinta Pinjarra’s assets’ operations and availability.</p> | <p>Action Plan 5/2017</p> <p>Alinta Pinjarra will:</p> <p>(a) Establish a formal process for ensuring that contingency arrangements in place for all key risks to the power station’s operations and availability (such as fuel and water supply) are rigorously challenged and tested</p> <p>(b) Prepare a clear overarching “umbrella” document to capture all contingency plans in place for each of the key risks to Alinta Pinjarra’s assets’ operations and availability.</p> <p>Responsible Person: Head of Asset Management</p> <p>Target Date: March 2018</p> | |

| AMS Key Process and Effectiveness Criteria | Adequacy rating | Issue 6/2017 |
|--|--|---|
| AMS Review 12(b) Independent reviews (e.g. internal audit) are performed of the asset management system | Adequately defined (A) | Although components of Alinta Pinjarra's asset management system are subject to regular review and update, Alinta Pinjarra has not applied a formal process for ensuring a sufficient degree of independence in any regular review of the asset management plan and underlying asset management system. |
| | Performance rating | |
| | Opportunity for improvement (2) | |
| Recommendation 6/2017 In accordance with the Alinta Energy Asset Management Framework, Alinta Pinjarra implement: <ul style="list-style-type: none"> (a) The requirement for its asset management system to be subject to an independent review on a regular basis (b) A register or record to capture the reviews conducted on its asset management system and the independence of the associated reviewer. | Action Plan 6/2017 Alinta Pinjarra will implement: <ul style="list-style-type: none"> (a) The requirement for its AMS to be subject to an independent review on a regular basis (b) A register or record to capture the reviews conducted on its AMS and the independence of the associated reviewer. Responsible Person: Head of Asset Management Target Date: August 2018 | |

2.5 Scope and objectives

In accordance with the Review Guidelines, the review considered the effectiveness of Alinta Pinjarra's existing control procedures within the 12 key processes in the asset management life-cycle as outlined below at Table 1. Each key process and effectiveness criteria is applicable to Alinta Pinjarra's Licence and as such was individually considered as part of the review.

Table 1 – Asset management system key processes and effectiveness criteria

| # | Key process | Effectiveness criteria |
|---|--------------------------------|--|
| 1 | Asset planning | <ul style="list-style-type: none"> (a) Asset management plan covers key requirements (b) Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning (c) Service levels are defined (d) Non-asset options (e.g. demand management) are considered (e) Lifecycle costs of owning and operating assets are assessed (f) Funding options are evaluated (g) Costs are justified and cost drivers identified (h) Likelihood and consequences of asset failure are predicted (i) Plans are regularly reviewed and updated. |
| 2 | Asset creation and acquisition | <ul style="list-style-type: none"> (a) Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions (b) Evaluations include all life-cycle costs (c) Projects reflect sound engineering and business decisions (d) Commissioning tests are documented and completed (e) Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood. |
| 3 | Asset disposal | <ul style="list-style-type: none"> (a) Under-utilised and under-performing assets are identified as part of a regular systematic review process (b) The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken (c) Disposal alternatives are evaluated (d) There is a replacement strategy for assets. |

| # | Key process | Effectiveness criteria |
|---|--|---|
| 4 | Environmental analysis (all external factors that affect the system) | <ul style="list-style-type: none"> (a) Opportunities and threats in the system environment are assessed (b) Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved (c) Compliance with statutory and regulatory requirements (d) Achievement of customer service levels. |
| 5 | Asset operations | <ul style="list-style-type: none"> (a) Operational policies and procedures are documented and linked to service levels required (b) Risk management is applied to prioritise operations tasks (c) 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 (d) Operational costs are measured and monitored (e) Staff resources are adequate and staff receive training commensurate with their responsibilities. |
| 6 | Asset maintenance | <ul style="list-style-type: none"> (a) Maintenance policies and procedures are documented and linked to service levels required (b) Regular inspections are undertaken of asset performance and condition (c) Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule (d) Failures are analysed and operational/maintenance plans adjusted where necessary (e) Risk management is applied to prioritise maintenance tasks (f) Maintenance costs are measured and monitored. |
| 7 | Asset management information system | <ul style="list-style-type: none"> (a) Adequate system documentation exists for users and IT operators (b) Input controls include appropriate verification and validation of data entered into the system (c) Logical security access controls appear adequate, such as passwords (d) Physical security access controls appear adequate (e) Data backup procedures appear adequate and backups are tested (f) Key computations related to licensee performance reporting are materially accurate (g) Management reports appear adequate for the licensee to monitor licence obligations. |
| 8 | Risk management | <ul style="list-style-type: none"> (a) Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the AMS (b) Risks are documented in a risk register and treatment plans are actioned and monitored (c) The probability and consequences of asset failure are regularly assessed. |
| 9 | Contingency planning | <ul style="list-style-type: none"> (a) Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks. |

| # | Key process | Effectiveness criteria |
|----|-----------------------------------|---|
| 10 | Financial planning | (a) The financial plan states the financial objectives and strategies and actions to achieve the objectives (b) The financial plan identifies the source of funds for capital expenditure and recurrent costs (c) The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) (d) The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period (e) The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services (f) Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary. |
| 11 | Capital expenditure planning | (a) There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates (b) The plan provides reasons for capital expenditure and timing of expenditure (c) The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan (d) There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned. |
| 12 | Review of Asset Management System | (a) A review process is in place to ensure that the asset management plan and the AMS described therein are kept current (b) Independent reviews (e.g. internal audit) are performed of the AMS. |

Each key process and effectiveness criterion is applicable to Alinta Pinjarra's Licence and as such was individually considered as part of the review. The Review Plan set out at Appendix A details the risk assessments made for and review priority assigned to each key process and effectiveness criterion.

2.6 Approach

Our approach for this review involved the following activities, which were undertaken during the period August to October 2017:

- Utilising the Guidelines as a guide, development of a risk assessment, which involved discussions with key staff and document review to assess relevant controls
- Development of a Review Plan (see **Appendix A**) for approval by the ERA
- Correspondence and interviews with Alinta Pinjarra staff to gain understanding of process controls in place (see **Appendix B** for staff involved)
- Visited Alinta's Pinjarra power station site with a focus on understanding the facility, its function and normal mode of operation, its age and an assessment of the facility against the AMS review criteria
- Review of documents, processes and controls to assess the overall effectiveness of Alinta Pinjarra's asset management systems (see **Appendix B** for reference listing)
- Consideration of the resourcing applied to maintaining those controls and processes
- Reporting of findings to Alinta Pinjarra for review and response.

2.7 Inherent limitations

A limited assurance engagement is substantially more limited in scope than a reasonable assurance engagement conducted in accordance with ASAE 3500 and consequently does not allow us to obtain assurance that we would become aware of all significant matters that might

be identified in a reasonable assurance engagement. Accordingly, we will not express an opinion providing reasonable assurance.

Because of the inherent limitations of any compliance procedure, it is possible that fraud, error or non-compliance may occur and not be detected. We cannot, in practice, examine every activity and procedure, nor can we be a substitute for management's responsibility to maintain adequate controls over all levels of operations and its responsibility to prevent and detect irregularities, including fraud. Accordingly, readers of our reports should not rely on the report to identify all potential instances of non-compliance which may occur.

Any projection of the evaluation of the effectiveness of asset management system processes and procedures to future periods is subject to the risk that the processes and procedures may become inadequate because of changes in conditions, or that the degree of compliance with management procedures may deteriorate.

3 Summary of ratings

In accordance with the Guidelines, the assessment of both the process and policy definition adequacy rating (refer to **Table 1**) and the performance rating (refer to **Table 2**) for each of the key asset management system processes is performed using the below ratings.

For the avoidance of doubt, these ratings do not provide reasonable assurance.

Table 1: 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). |
| C | Requires significant improvement | <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 2: Asset management performance ratings

| 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. |

This report provides:

- A breakdown of each function of the asset management system into sub-components as described in the Guidelines. This approach is taken to enable a more thorough review of key processes where individual components within a larger process can be of greater risk to the business therefore requiring different review treatment
- A summary of the ratings applied by the review (**Table 3**) for each of:
 - Asset management process and policy definition adequacy (**definition adequacy rating**)
 - Asset management performance (**performance rating**).
- Detailed findings, including relevant observations, recommendations and action plans (**Section 4**). Descriptions of the effectiveness criteria can be found in section 4 and the Review Plan at Appendix A.

Table 3: AMS effectiveness summary

| Ref | Effectiveness criteria | Review Priority | Ratings | |
|--|--|-----------------|---------------------|-------------|
| | | | Definition adequacy | Performance |
| 1. Asset planning | | | A | 1 |
| 1(a) | Asset management plan covers key requirements | Priority 4 | B | 2 |
| 1(b) | Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning | Priority 5 | A | 1 |
| 1(c) | Service levels are defined | Priority 5 | A | 1 |
| 1(d) | Non-asset options (e.g. demand management) are considered | Priority 5 | A | 1 |
| 1(e) | Lifecycle costs of owning and operating assets are assessed | Priority 4 | A | 1 |
| 1(f) | Funding options are evaluated | Priority 5 | A | 1 |
| 1(g) | Costs are justified and cost drivers identified | Priority 5 | A | 1 |
| 1(h) | Likelihood and consequences of asset failure are predicted | Priority 2 | A | 1 |
| 1(i) | Plans are regularly reviewed and updated | Priority 5 | A | 1 |
| 2. Asset creation and acquisition | | | A | 1 |
| 2(a) | Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions | Priority 4 | A | 1 |
| 2(b) | Evaluations include all life-cycle costs | Priority 4 | A | 1 |
| 2(c) | Projects reflect sound engineering and business decisions | Priority 4 | A | 1 |
| 2(d) | Commissioning tests are documented and completed | Priority 4 | A | 1 |
| 2(e) | Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood | Priority 4 | A | 1 |
| 3. Asset disposal | | | A | 1 |
| 3(a) | Under-utilised and under-performing assets are identified as part of a regular systematic review process | Priority 5 | A | 1 |
| 3(b) | The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken | Priority 5 | A | 1 |
| 3(c) | Disposal alternatives are evaluated | Priority 5 | A | 1 |
| 3(d) | There is a replacement strategy for assets | Priority 5 | A | 1 |
| 4. Environmental analysis | | | A | 1 |
| 4(a) | Opportunities and threats in the system environment are assessed | Priority 2 | A | 1 |
| 4(b) | Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved | Priority 4 | A | 1 |
| 4(c) | Compliance with statutory and regulatory requirements | Priority 3 | B | 1 |
| 4(d) | Achievement of customer service levels | Priority 4 | A | 1 |
| 5. Asset operations | | | A | 1 |
| 5(a) | Operational policies and procedures are documented and linked to service levels required | Priority 4 | A | 2 |
| 5(b) | Risk management is applied to prioritise operations tasks | Priority 4 | A | 1 |
| 5(c) | 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 | Priority 4 | A | 1 |

| Ref | Effectiveness criteria | Review Priority | Ratings | |
|---|--|-----------------|---------------------|-------------|
| | | | Definition adequacy | Performance |
| 5(d) | Operational costs are measured and monitored | Priority 4 | A | 1 |
| 5(e) | Staff resources are adequate and staff receive training commensurate with their responsibilities | Priority 4 | A | 1 |
| 6. Asset maintenance | | | A | 2 |
| 6(a) | Maintenance policies and procedures are documented and linked to service levels required | Priority 2 | A | 2 |
| 6(b) | Regular inspections are undertaken of asset performance and condition | Priority 2 | A | 1 |
| 6(c) | Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule | Priority 2 | A | 1 |
| 6(d) | Failures are analysed and operational/maintenance plans adjusted where necessary | Priority 2 | A | 1 |
| 6(e) | Risk management is applied to prioritise maintenance tasks | Priority 2 | A | 2 |
| 6(f) | Maintenance costs are measured and monitored | Priority 4 | A | 1 |
| 7. Asset management information system | | | A | 1 |
| 7(a) | Adequate system documentation exists for users and IT operators | Priority 5 | A | 1 |
| 7(b) | Input controls include appropriate verification and validation of data entered into the system | Priority 5 | A | 1 |
| 7(c) | Logical security access controls appear adequate, such as passwords | Priority 5 | A | 1 |
| 7(d) | Physical security access controls appear adequate | Priority 5 | A | 1 |
| 7(e) | Data backup procedures appear adequate and backups are tested | Priority 4 | A | 1 |
| 7(f) | Key computations related to licensee performance reporting are materially accurate | Priority 5 | NR | NR |
| 7(g) | Management reports appear adequate for the licensee to monitor licence obligations | Priority 5 | A | 1 |
| 8. Risk management | | | B | 2 |
| 8(a) | Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the AMS | Priority 2 | A | 1 |
| 8(b) | Risks are documented in a risk register and treatment plans are actioned and monitored | Priority 4 | B | 2 |
| 8(c) | The probability and consequences of asset failure are regularly assessed | Priority 2 | A | 1 |
| 9. Contingency planning | | | B | 2 |
| 9(a) | Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks | Priority 2 | B | 2 |
| 10. Financial planning | | | A | 1 |
| 10(a) | The financial plan states the financial objectives and strategies and actions to achieve the objectives | Priority 5 | A | 1 |
| 10(b) | The financial plan identifies the source of funds for capital expenditure and recurrent costs | Priority 5 | A | 1 |
| 10(c) | The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) | Priority 5 | A | 1 |
| 10(d) | The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period | Priority 5 | A | 1 |
| 10(e) | The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services | Priority 4 | A | 1 |
| 10(f) | Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary | Priority 4 | A | 1 |
| 11. Capital expenditure planning | | | A | 1 |
| 11(a) | There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates | Priority 4 | A | 1 |
| 11(b) | The plan provides reasons for capital expenditure and timing of expenditure | Priority 5 | A | 1 |
| 11(c) | The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan | Priority 4 | A | 1 |
| 11(d) | There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned | Priority 5 | A | 1 |
| 12. Review of AMS | | | A | 2 |
| 12(a) | A review process is in place to ensure that the asset management plan and the AMS described therein are kept current | Priority 5 | A | 1 |
| 12(b) | Independent reviews (e.g. internal audit) are performed of the AMS | Priority 5 | A | 2 |

4 Detailed findings, recommendations and action plans

Summary of operations subject to review

The Alinta Pinjarra cogeneration plant is located within Alcoa's Alumina Refinery Facilities at Pinjarra. The plant comprises two gas turbine cogeneration units with heat recovery steam generation boilers. The units were commissioned in 2005 and 2006 respectively. Key details relating to the units are as follows:

- Unit #1 has a nameplate generation capacity of 140MW. Electricity from this unit is transmitted via a 132kV transmission line to Western Power's substation located at the Pinjarra refinery
- Unit #2 has a similar electricity generation capacity. Electricity from this unit is transmitted via a 7.4km, 330kV transmission line to Western Power's substation located at Oakley.

The two heat recovery steam generators are fitted with duct burners and are rated to produce 400 tonnes per hour of high pressure steam that is supplied to the Alcoa refinery to meet the refinery process steam requirements. Alinta Pinjarra currently maintains an Operating and Maintenance Agreement with Alcoa, which requires Alcoa to maintain Alinta Pinjarra's cogeneration asset management system. Alinta Pinjarra has also established a Long Term Service Agreement with Alstom for the maintenance of the gas turbines.

A loss of Alinta Pinjarra's cogeneration capability has the following effect:

- In the event that Alinta Pinjarra's cogeneration equipment fails, there is a direct loss of generation for the Western Power operated grid. Loss of one Alinta Pinjarra cogeneration unit has manageable impact on the Alcoa refinery. A loss of both units is likely to have a direct impact on refinery production
- Loss of Alinta Pinjarra cogeneration steam capacity may also directly impact refinery production. Owing to the cost impact, lost production is significant; therefore concerted effort is made to ensure high availability and reliability of major steam equipment.

The following tables contain:

- *Findings*: the reviewer's understanding of the process and any issues that have been identified during the review
- *Recommendations (where applicable)*: recommendations for improvement or enhancement of the process or control
- *Action plans (where applicable)*: Alinta Pinjarra's formal response to review recommendations, providing details of action to be implemented to address the specific issue raised by the review.

4.1 Asset planning

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

Expected outcome: 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

Overall Adequacy/Performance rating: Adequately defined (A) / Performing effectively (1)

| No | Effectiveness Criteria | Findings |
|------|---|--|
| 1(a) | Asset management plan covers key requirements | <p>Through discussion with the General Manager Power Generation and the Head of Asset Management, and consideration of Alinta Pinjarra's business planning processes, we determined that Alinta Pinjarra's business planning model accommodates its operation and maintenance of the Pinjarra power station site in accordance with its contractual arrangements and regulatory requirements.</p> <p>From a business planning perspective, we determined that Alinta Pinjarra has established asset management processes and mechanisms to assimilate the requirements of its various stakeholders. In particular, we observed that Alinta Pinjarra has:</p> <ul style="list-style-type: none"> Adopted an AMS (which aligns with ISO55000:2014, ISO 55001:2014 and ISO 55002:2014 and the British Publicly Available Specification (PAS) Asset Management Standard PAS 55-1:2008) Developed a supporting Asset Management Plan (AMP) for operating and maintaining the various components of the power station to achieve optimum performance over the entire life of those assets. The AMP defines Alinta Pinjarra's broader and long term plans and is reviewed on an annual basis. <p>Although the Alinta Energy Pinjarra Power Station – Asset Management Plan FY2018 - FY2022 generally reflects Alinta Pinjarra's expectations and requirements for managing its generation assets, the AMP can be further improved as it does not clearly address the following elements expected by Alinta Energy's Asset Management Framework:</p> <ul style="list-style-type: none"> Contingency plans designed to mitigate the business impact of incidents or emergencies arising as a result of realised asset related risks A brief description of any known and significant risks relating to assets Consideration and documentation of legal and compliance requirements. |
| | | <p>Adequacy Rating: Requires some improvement (B)</p> <p>Performance Rating: Opportunity for improvement (2)</p> |
| | | <p>Recommendation 1/2017 Alinta Pinjarra update its AMP to explicitly incorporate the following elements of its Asset Management Framework and EGL obligations:</p> <ul style="list-style-type: none"> Contingency plans Known and significant risks relating to key assets Legal and compliance requirements. <p>Action Plan 1/2017 Alinta Pinjarra will update its AMP to explicitly incorporate the following elements of its Asset Management Framework and EGL obligations:</p> <ul style="list-style-type: none"> Contingency plans Known and significant risks relating to key assets Legal and compliance requirements. <p>Responsible Person: Head of Asset Management Target Date: August 2018</p> |

| No | Effectiveness Criteria | Findings | |
|------|--|--|---|
| 1(b) | Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning | <p>Through discussion with the General Manager Power Generation, Head of Asset Management, Lead Engineering Planner and Finance Manager - Power Generation, and consideration of Alinta Pinjarra's business planning processes, we determined that:</p> <ul style="list-style-type: none"> • Alinta Pinjarra's business planning model and planning documentation is developed in consultation with a range of business functions including: <ul style="list-style-type: none"> ○ Senior management ○ Engineering ○ Site-based management ○ Finance • A formal delegation of authority framework is in place across the stakeholder functions (operations, finance and compliance) and integrated into its SharePoint information storage portal for project task and expenditure approval. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 1(c) | Service levels are defined | <p>Through discussion with the Head of Asset Management and Lead Engineering Planner, and examination of Alinta Pinjarra's AMP and contractual documentation, we determined that the plant's required service levels have been:</p> <ul style="list-style-type: none"> • Summarised in the AMP to facilitate the achievement of those service levels. The AMP references relevant operational information for each item of equipment and is updated on an annual basis • Defined in Alinta Pinjarra's maintenance standards, which are integrated into Alcoa's eAM maintenance management system • Programmed into Alcoa's eAM asset management work order system to track routine maintenance requirements across all asset components. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 1(d) | Non-asset options (e.g. demand management) are considered | <p>Through discussion with the General Manager Power Generation, Head of Asset Management and Lead Engineering Planner, and examination of the business case development process for new projects and major acquisitions, we determined that Alinta Pinjarra has the following procedures in place for the consideration of non-asset options:</p> <ul style="list-style-type: none"> • Prior to detailing a business case for the purchase of assets, the applicant is required to complete an investigation approval form, which is an initial feasibility assessment that is used to allocate resources and timing to the business case development • If the investigation is approved, the applicant is required to complete a business case • As part of its business case process for the acquisition of new assets, the applicant is required to detail alternative project options (including consideration of maintaining the status quo). | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 1(e) | Lifecycle costs of owning and operating assets are assessed | <p>Through discussion with the Head of Asset Management and examination of Alinta Pinjarra's AMP and finance models, we determined that assessment of lifecycle costs of owning and operating the assets is reflected in the AMP, which addresses each major equipment component and provides specific details, including:</p> | |

| No | Effectiveness Criteria | Findings |
|------|--|--|
| | | <ul style="list-style-type: none"> • Operating and maintenance philosophy • Key lifecycle issues and how they are addressed • Lifecycle plan and critical outages • Performance improvement opportunities • Critical reinvestments • Retirement/disposal consideration at end of plant life • Capex and Opex forecast for a five year period. <p>Alinta Pinjarra also uses an economic evaluation model as part of the budgeting and forecasting process to assess the cost associated with the overall plant life and forecast expenditure up to FY 2049.</p> |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 1(f) | Funding options are evaluated | <p>Through discussion with the Head of Asset Management and Finance Manager – Power Generation; and examination of Alinta Pinjarra’s AMP and financial models, we determined that:</p> <ul style="list-style-type: none"> • Day to day operating expenses are funded from operating cash flows • Funding options are considered and evaluated by means of the Request for Commitment on the AMP Expenditure Project Delivery Site (integrated within SharePoint), which details: <ul style="list-style-type: none"> ○ Expenditure description relative to plan (budget vs unbudgeted) ○ Expenditure type (Opex/Capex) • A Delegated Financial Authority matrix and automated workflow system within the ‘Request for Commitment’ approval process (within SharePoint) helps ensure that fund requests above specified levels are required to be authorised by the appropriate level of management. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 1(g) | Costs are justified and cost drivers identified | <p>Through discussion with the Head of Asset Management and Finance Manager – Power Generation; and consideration of Alinta Pinjarra’s AMP and financial models, we determined that the:</p> <ul style="list-style-type: none"> • AMP includes a detailed lifecycle plan that identifies and assesses all lifecycle costs and cost drivers associated with the power station • Business case approval process and associated templates require the costs and cost drivers (in the form of a business case) to be identified. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 1(h) | Likelihood and consequences of asset failure are predicted | <p>Through discussion with the Head of Asset Management and examination of Alinta Pinjarra’s AMP and relevant supporting documentation, we determined that:</p> <ul style="list-style-type: none"> • The AMP is a major tool used for predicting the likelihood and consequence of asset failure. The AMP considers each major item of equipment and provides specific details of its operation and maintenance strategy and key lifecycle issues and remedial plans |

| No | Effectiveness Criteria | Findings | |
|------|---|--|---|
| | | <ul style="list-style-type: none"> • The O&M Agreement requires Alcoa to provide and operate an asset management system on Alinta Pinjarra's behalf. Alcoa has applied the following mechanisms for identifying consequence and likelihood of powerhouse asset failure: <ul style="list-style-type: none"> ○ Asset integrity audits, which are completed on a five yearly basis. Audit findings are maintained in a database and tracked through to completion ○ Other audits, which feed results into Alcoa's Business Improvement System. Similarly, audit findings are stored and tracked for completion ○ Loss prevention inspections, as a major aspect of Alcoa's risk management activities directed at powerhouse operations ○ Classified plant inspections, which are conducted as per statutory requirements • During scheduled outages (e.g. long term shutdowns), main components of the facility's plant are inspected for defects by Alcoa site staff and external contractors. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 1(i) | Plans are regularly reviewed and updated. | Through discussions with Head of Asset Management and consideration of Alinta Pinjarra's AMP and relevant supporting asset planning documentation, we determined that the AMP has been reviewed and revised on an annual basis. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |

4.2 Asset creation and acquisition

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

Expected outcome: A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery

Overall Adequacy/Performance rating: Adequately defined (A) / Performing effectively (1)

| No | Effectiveness Criteria | Findings |
|------|---|---|
| 2(a) | Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions | <p>Through consideration of relevant supporting documentation and discussion with the Head of Asset Management and Finance Manager – Power Generation, we determined that Alinta Pinjarra has adopted expenditure approval procedures, which outline the requirement for project evaluations to be undertaken prior to seeking funds approval. As part of the project evaluation process, Alinta Pinjarra requires the following to be completed:</p> <ul style="list-style-type: none"> • A full business case, which provides approval criteria for instigating new projects including; financial and capital requirements, current state assessment, asset/non-asset alternatives and timeline • Economic evaluation modelling in support of the business case. The modelling utilises a standard set of high level economic assumptions to assess the cost associated with the overall plant life and generate cost predictions over the 40 years of plant life • Consideration of non-asset options. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 2(b) | Evaluations include all life-cycle costs | <p>Through discussion with the Head of Asset Management and Finance Manager – Power Generation, and examination of the procedures for expenditure approval and associated forms and templates, we determined that Alinta Pinjarra has the following process in place to assess lifecycle costs of owning and operating assets:</p> <ul style="list-style-type: none"> • Assessment of lifecycle costs of owning and operating the assets is reflected in the AMP, which addresses each major equipment component and provides specific details, including: <ul style="list-style-type: none"> ○ Operating and maintenance philosophy ○ Key lifecycle issues and how they are addressed ○ Lifecycle plan and critical outages ○ Performance improvement opportunities ○ Critical reinvestments ○ Retirement/disposal consideration at end of plant life • An economic evaluation model is utilised as part of budgeting and forecasting process to assess the cost associated with the overall plant life and forecast expenditure up to 2049 • Project evaluations provide for estimates of the amount of investment required as well as identifying the source of funds. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |

| No | Effectiveness Criteria | Findings |
|------|--|--|
| 2(c) | Projects reflect sound engineering and business decisions | <p>Through discussion with the Head of Asset Management and Finance Manager – Power Generation, and examination of Alinta Pinjarra’s AMP, expenditure approval process (including the automated approval process through Alinta’s SharePoint site) and associated forms and templates, we determined that Alinta Pinjarra has the following procedures in place to assess the commercial and technical competence of projects:</p> <ul style="list-style-type: none"> • Project evaluations are performed with the input from engineering and finance personnel and results detailed and approved by relevant department stakeholders to ensure all engineering, finance, environmental, health and safety aspects are addressed • Project modelling tools are applied to project evaluations, taking into account relevant economic measures • Commercial sign-off is required, which incorporates the above considerations and addresses any potential contract risks when engaging external parties. <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 2(d) | Commissioning tests are documented and completed | <p>Through discussion with the Head of Asset Management and consideration of relevant procedures, we observed that:</p> <ul style="list-style-type: none"> • Alinta Pinjarra (and its external contractors) performed commissioning tests during the review period as part of its standard process for adding/replacing asset components (e.g. during planned shutdowns) • Commissioning tests form part of the project lifecycle, which is recorded on SharePoint • Where Alinta Pinjarra engages external contractors to perform commissioning tests: <ul style="list-style-type: none"> ○ Testing reports are prepared by the site engineering team and stored on SharePoint ○ Service requirements are governed by contractual terms relating to any major service required. <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 2(e) | Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood. | <p>Through discussion with the General Manager Power Generation and examination of relevant supporting documentation, we determined that, for the purpose of its ongoing asset management obligations Alinta Pinjarra has:</p> <ul style="list-style-type: none"> • Identified legal, environmental and safety obligations relating to its power station assets • Assigned responsibilities to staff on site and in the Perth office for managing Alinta Pinjarra’s environmental and safety obligations in accordance with OHS and Environmental management plans • Implemented an organised document management system within SharePoint for housing regulatory obligations such as licences, related management plans and monitoring/compliance reports • Assigned responsibilities to its national legal team for monitoring any updates or changes to regulatory obligations and reporting requirements. <p>We sighted evidence of Alinta Pinjarra’s Compliance Manual, which demonstrates identification, assessment and treatment of risks relating to its legal, environmental and safety obligations within the Pinjarra site.</p> <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |

4.3 Asset disposal

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

Expected outcome: Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs

Overall Adequacy/Performance rating: Adequately defined (A) / Performing effectively (1)

| No | Effectiveness Criteria | Findings |
|------|--|--|
| 3(a) | Under-utilised and under-performing assets are identified as part of a regular systematic review process | <p>Through discussion with the Head of Asset Management and Lead Engineering Planner, examination of relevant supporting documentation, and walkthrough of Alinta Pinjarra's Incident Management System, we determined that Alinta Pinjarra has applied the following mechanisms for identifying under-utilised and under-performing assets:</p> <ul style="list-style-type: none"> The AMP considers each major item of equipment and provides details of the facility's operations and maintenance strategy, key lifecycle issues and remedial plans A detailed forward maintenance program is maintained by Alcoa in accordance with manufacturer's guidelines and expert experience for the plant The operational performance of the Pinjarra facilities is monitored through the Honeywell Experion system, with weekly performance dashboard reports presented to management for review Results of these assessments and inspections are included in the rolling five year plans Unexpected asset failures are logged in the Incident Management System, which details: <ul style="list-style-type: none"> Incident description Relevant Workgroup responsible Incident Type (e.g. equipment, environmental etc.) Incident Status. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 3(b) | The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken | <p>Through discussion with the Head of Asset Management and examination of relevant supporting documentation, we determined that Alinta Pinjarra has applied the mechanisms at Asset Disposal (s.3(a)) to facilitate the examination of under-utilised and under-performing assets by:</p> <ul style="list-style-type: none"> Undertaking root cause analyses of under-utilisation or poor performance of power station assets Applying a project evaluation approach as part of the capital expenditure approval process, which requires a justification of why the upgrade/purchase of equipment is crucial to the condition of the asset Incorporating assessments into rolling five year plans that detail the major capital projects planned for the coming financial year. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 3(c) | Disposal alternatives are evaluated | <p>Through discussion with the Head of Asset Management and the Lead Engineering Planner; and examination of supporting documentation, we determined that Alinta Pinjarra's processes require:</p> <ul style="list-style-type: none"> Consideration of alternatives for decommissioning, removal or storage of key plant |

| No | Effectiveness Criteria | Findings | |
|------|---|---|---|
| | | <ul style="list-style-type: none"> The rolling five year plans to provide details of the major projects planned for each asset in the coming financial year, including any equipment replacement requirements Asset disposals to be performed in accordance with Project Management processes (including the Management of Change system process) and the AMP. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 3(d) | There is a replacement strategy for assets. | <p>Through discussion with the Head of Asset Management and consideration of Alinta Pinjarra's AMP and decommissioning documentation we observed that:</p> <ul style="list-style-type: none"> The AMP considers each major item of equipment and provides specific details of the facility's operations and maintenance strategy, key lifecycle issues and remedial plans Alinta developed an organisation-wide Decommissioning Policy in March 2013 Alinta Pinjarra engages an external contractor (Jacobs) to provide a decommissioning analysis (including projection of costs) Rolling five year plans provide details of the major projects planned for each asset in the coming financial year, including any equipment replacement requirements. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |

4.4 Environmental analysis

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

Expected outcome: The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements.

Overall Adequacy/Performance rating: Adequately defined (A) / Performing effectively (1)

| No | Effectiveness Criteria | Findings |
|------|--|---|
| 4(a) | Opportunities and threats in the system environment are assessed | <p>Through discussion with the Alcoa WA Operations CoGen Supervisor and General Manager Power Generation, and examination of supporting documentation, we determined that:</p> <ul style="list-style-type: none"> • Alinta Pinjarra maintains a site-based Compliance Manual, which outlines: <ul style="list-style-type: none"> ○ NOx emissions targets and requirements ○ Greenhouse gas emissions obligations under the NGER Act ○ Occupational Health and Safety Regulations. Alinta's Energy Occupational Health and Safety Management Framework accommodates Alinta's core focus on safety ○ Additional licence and Standard requirements (e.g. Dangerous Goods Storage Licence requirements and Plant and Pressure Vessel Registration) • Under the O&M Agreement, Alcoa is obligated to maintain compliance with the site's environmental performance standards, as reported in Environmental Ministerial Performance and Compliance Reports (we sighted the December 2016 report as an example) • Risks and incidents can be logged by any employee/contractor onto the Environmental, Health and Safety Incident Management System (EHSIMS), which are then assessed by the Environmental Team • Incidents logged via the EHSIMS are reviewed at daily Powerhouse and refinery meetings • Alinta Pinjarra recently created an initiative to develop an Environmental Aspects and Impacts procedure, which will further strengthen Alinta Pinjarra's capability to: <ul style="list-style-type: none"> ○ Ensure the systematic review of environmental aspects and impacts ○ Facilitate the identification and assessment of opportunities and threats to the Pinjarra operations system environment ○ Comply with ISO 14001, Dangerous Goods regulations and health and safety requirements. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |

| No | Effectiveness Criteria | Findings | |
|------|--|---|---|
| 4(b) | Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved | <p>Through discussion with the General Manager Power Generation and the Lead Engineering Planner, and consideration of Alinta Pinjarra's performance monitoring practices, we determined that:</p> <ul style="list-style-type: none"> • The O&M Agreement requires Alcoa to report on key environmental aspects on a monthly basis, which are incorporated into Alinta Pinjarra's management reports. Environmental matters relevant to Alinta Pinjarra's generation operations are accommodated through established Alcoa WA Operations environmental management mechanisms, through which performance standards specific to Alinta Pinjarra's cogeneration facilities are identified and managed • Alinta Pinjarra is required to report any breaches of emission limits (e.g. for SO₂ and NO_x) to the Department of Environment. Alinta Pinjarra monitors its emissions in sufficient detail to flag any instance where its emission limits are breached • Performance of the plant is also measured by means of maintenance metrics, such as: <ul style="list-style-type: none"> ○ Planned work ratio, which measures how much of the total week is spent on planned work ○ Planned work complete, which measures how much of the work that was planned for the week actually was completed. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 4(c) | Compliance with statutory and regulatory requirements | <p>Through discussion with the General Manager Power Generation and consideration of relevant supporting documentation and sample Ministerial compliance reports, we determined that:</p> <ul style="list-style-type: none"> • Alinta Pinjarra operates and monitors its operations in accordance with the following statutory and regulatory requirements: <ul style="list-style-type: none"> ○ Mines Safety and Inspection Regulations ○ WA Gas Standards (Gas fitting & Consumer Gas Installations) Regulations 1999 ○ Environmental Operating Licence, which includes NO_x emissions targets and requirements. We observed that monitoring of NO_x emissions is undertaken on a continuous basis to enable reporting of any breaches in accordance with the environmental licence requirements. Alcoa has maintained the ISO-14001 standard and as such is required to maintain an effective Environmental Management System (EMS) that monitors all obligations that have an environmental focus ○ Environmental Noise Regulations licence, which specifies the maximum night and day noise levels as measured at the boundary ○ Occupational Health and Safety Regulations. Alinta's Energy Occupational Health and Safety Management Framework accommodates Alinta Pinjarra's core focus on safety • In response to previous AMS Review recommendations referring to noise level requirements, Alinta Pinjarra engaged independent engineering consultants to undertake a Combustion Tuning report and a Cogeneration Steam Venting Noise Testing Assessment. In examining these reports, we determined that: <ul style="list-style-type: none"> ○ Emissions testing demonstrated compliance with licence requirements ○ Installation of the new steam silencers to both units in quarter 2 2014 has made a slight, but not significant difference to noise levels at the boundary | |

| No | Effectiveness Criteria | Findings | |
|------|--|---|---|
| | | <ul style="list-style-type: none"> Although Alinta Pinjarra may be challenged to maintain compliance levels during start up when steam venting is undertaken and noise levels are higher, the frequency and duration of this occurrence can be managed to ensure compliance. <p>In response to a finding of the previous (2013) AMS review that Alinta Pinjarra's site Compliance Manual remained in draft form, Alinta Pinjarra devised an action plan for the Manual to be reviewed and finalised. As the Manual had not been formally reviewed and approved as a final document as at 30 June 2017, the issue and action plan remained outstanding for the purpose of this review.</p> <p>In August 2017, the Compliance Manual was reviewed and updated to reflect the current legal, safety and environmental obligations relating to Alinta Pinjarra's operations. <i>No further action is required.</i></p> | |
| | | Adequacy Rating: Requires some improvement (B) | Performance Rating: Performing effectively (1) |
| | | Recommendation 2/2017 Not applicable – the necessary corrective action was taken in August 2017. | Action Plan 2/2017 Complete - August 2017 |
| 4(d) | Achievement of customer service levels | <p>Through discussion with the Alcoa WA Operations CoGen Supervisor and General Manager Power Generation and consideration of supporting procedures and reporting documentation, we determined that:</p> <ul style="list-style-type: none"> Other than in the supply of electricity and steam to Alcoa as part of its commercial obligations, Alinta Pinjarra does not have specific customer service levels to attain in relation to its power operations Alinta Pinjarra's and Alcoa's processes provide for continuous monitoring of performance standards through weekly reporting mechanisms and live reporting data The above personnel (and examination of reporting data) did not raise any issues with failing to meet customer service levels. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |

4.5 Asset operations

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

Expected outcome: Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved

Overall Adequacy/Performance rating: Adequately defined (A) / Performing effectively (1)

| No | Effectiveness Criteria | Findings | |
|------|--|--|--|
| 5(a) | Operational policies and procedures are documented and linked to service levels required | <p>Through discussion with the General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, and consideration of supporting documentation, we determined that:</p> <ul style="list-style-type: none"> • Reporting dashboards have been established to provide a weekly summary of the site's performance • The O&M Agreement requires Alcoa to operate a functioning asset management system. Alcoa has: <ul style="list-style-type: none"> ○ Documented its powerhouse related policies, procedures and protocols with the Alcoa WA Operations Performance Support System ○ Developed procedures, which specifically refer to required service levels (where appropriate) for the operation of the specific item of equipment, or specific electrical or mechanical procedures ○ Developed control plans for major items of plant. <p>In 2014, NEM Energy (HRSG manufacturer) was commissioned by Alinta Pinjarra to design and implement major modifications to the plant's cogeneration units to improve steam production capacity at low GT Loads. The updated drawings relating to those modifications are not yet fully integrated into the O&M system managed by Alcoa on Alinta Pinjarra's behalf.</p> | |
| | | <p>Adequacy Rating: Adequately defined (A)</p> | <p>Performance Rating: Opportunity for improvement (2)</p> |
| | | <p>Recommendation 3/2017 Alinta Pinjarra work with Alcoa to ensure updated drawings of the modified HRSG units are fully integrated within the O&M system.</p> | <p>Action Plan 3/2017 Alinta Pinjarra will work with Alcoa to ensure updated drawings of the modified HRSG units are fully integrated within the O&M system. Responsible Person: Head of Asset Management and Alcoa WA Operations CoGen Supervisor Target Date: June 2018</p> |
| 5(b) | Risk management is applied to prioritise operations tasks | <p>Through discussion with the General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, examination of Alinta Pinjarra's site risk register and consideration of Alinta's and Alcoa's application of their respective risk management and reporting frameworks, we determined that</p> <ul style="list-style-type: none"> • Alinta Energy's Enterprise Risk Management Framework has been applied to Alinta Pinjarra's operations to enable Alinta Pinjarra to make risk based decisions in relation to operational matters • Alcoa also applies a structured, risk based approach to its O&M activities, performed in accordance with the O&M Agreement. In particular, operational tasks focus on people and safety risks first, followed by environmental risks, then customer related risks. | |
| | | <p>Adequacy Rating: Adequately defined (A)</p> | <p>Performance Rating: Performing effectively (1)</p> |

| No | Effectiveness Criteria | Findings |
|--|--|---|
| 5(c) | 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>Through discussion with the Lead Engineering Planner and Finance Manager - Power Generation, General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, and examination of the Pinjarra Cogeneration Plant – AMP FY2018 - FY2022, supporting documents and information systems, we determined that:</p> <ul style="list-style-type: none"> • Alcoa, on Alinta Pinjarra's behalf, manages powerhouse equipment through its electronic asset maintenance system, eAM. eAM contains the following information for major equipment: <ul style="list-style-type: none"> ○ Unique asset identification (asset ID) ○ Equipment details, including type, location, components, operational capacity, age, expected life ○ Equipment history, including condition ○ Maintenance procedures ○ Maintenance intervals ○ Purchase cost, depreciation rates and net book value • Alinta Pinjarra monitors the value of assets (including depreciation) through its Financial Assets Register. |
| Adequacy Rating: Adequately defined (A) | | Performance Rating: Performing effectively (1) |
| 5(d) | Operational costs are measured and monitored | <p>Through discussion with the Finance Manager – Power Generation, General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, we determined that:</p> <ul style="list-style-type: none"> • The O&M Agreement requires Alcoa to provide Alinta Pinjarra with a monthly report detailing: <ul style="list-style-type: none"> ○ Operational costs incurred ○ Capital expenditure ○ Analysis of actual expenditure against budgeted expenditure • Alcoa's reports are incorporated into Alinta Pinjarra's monthly management reports • Significant variances between actual and budgeted expenditure are scrutinised by Alinta Finance staff, with the assistance of Alcoa personnel • Costs are allocated to assets automatically based on the work order and external costs are allocated to the relevant cost centre, which has relevant links to assets. |
| Adequacy Rating: Adequately defined (A) | | Performance Rating: Performing effectively (1) |
| 5(e) | Staff resources are adequate and staff receive training commensurate with their responsibilities | <p>Through discussion with the General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, and consideration of Alinta Pinjarra's staff resourcing and training arrangements, we determined that:</p> <ul style="list-style-type: none"> • Details of staff training requirements (including qualifications and competence) and training undertaken is maintained through Alcoa's central LMS Training Package • Alcoa's Powerhouse Training Report provides up-to-date statistics on staff training performed and compliance levels achieved • Alcoa utilises its WA Operations Operator Traineeship Program to enable its powerhouse operators to be fully trained in all key aspects of powerhouse operations, relevant to each individual's position • Staff are adequately qualified for their respective roles and their required licences are current. |
| Adequacy Rating: Adequately defined (A) | | Performance Rating: Performing effectively (1) |

4.6 Asset maintenance

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

Expected outcome: Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.

Overall Adequacy/Performance rating: Adequately defined (A) / Opportunity for improvement (2)

| No | Effectiveness Criteria | Findings |
|------|--|---|
| 6(a) | Maintenance policies and procedures are documented and linked to service levels required | <p>Through discussion with the General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, and consideration of the Pinjarra Cogeneration Plant – AMP FY2018 - FY2022, Alinta Pinjarra’s Long Term Service Agreement (LTSA) with the turbine manufacturer Mitsubishi Heavy Industries (MHI) and Combustion Inspection Scope of Works, we determined that:</p> <ul style="list-style-type: none"> Alcoa utilises the Oracle eAM computerised maintenance management system. Alcoa’s eAM system references major equipment maintenance procedures, equipment details, maintenance intervals, costs and equipment history and is linked to service levels required Alcoa has developed maintenance policies, procedures and protocols, which specifically refer to required service levels (where appropriate) for the operation of the specific item of equipment, or specific electrical or mechanical procedures. Those procedures are documented within the Alcoa WA Operations Performance Support System Performance reporting of the Pinjarra site is reviewed on a weekly basis by the Alinta Management team All Major Inspections and Outage Works during the review period have been undertaken by MHI, Turbine Services Australia (TSA) and/or HRL (asset integrity consultant). Those inspections and outage works are well scoped and documented. <p>In 2014, NEM Energy (HRSG manufacturer) was commissioned by Alinta Pinjarra to design and implement major modifications to the plant’s cogeneration units to improve steam production capacity at low GT Loads. The updated drawings relating to those modifications are not yet fully integrated into the O&M system managed by Alcoa on Alinta Pinjarra’s behalf.</p> |
| | | <p>Adequacy Rating: Adequately defined (A)</p> |
| | | <p>Performance Rating: Opportunity for improvement (2)</p> |
| | | <p>Recommendation 3/2017 <i>Refer to 5(a) above.</i></p> |
| | | <p>Action Plan 3/2017 <i>Refer to 5(a) above.</i></p> |

| No | Effectiveness Criteria | Findings | |
|------|---|--|---|
| 6(b) | Regular inspections are undertaken of asset performance and condition | <p>Schedule 1, Part 3, Section 7 of the O&M Agreement outlines Alcoa’s responsibility for all routine, maintenance and repair service in relation to the cogeneration facilities and for that maintenance to be carried out at scheduled times. The required tasks include:</p> <ul style="list-style-type: none"> • Routine and periodic visual inspection of the facilities • Routine and periodic testing of the facilities • Routine, scheduled, non-scheduled and emergency maintenance and repair • Periodic maintenance, shut down and inspection. <p>Through discussion with the General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, and examination of the MHI Combustion Inspection Report and TSA Outage Report, we observed that:</p> <ul style="list-style-type: none"> • Alcoa applies a structured program for key mechanical and electrical assets (such as turbines, feedwater pumps, transformers, generators, switchgear) to be condition monitored using online vibration monitoring devices and for earthing systems and protection relays to be regularly tested (including partial discharge) to avoid unplanned outages or failures • Equipment assessment and inspection reports (e.g. Pinjarra cogeneration Unit 1 major combustion inspection) are generated and made available to staff and management, providing information on equipment condition and performance • Alinta Pinjarra has entered into a LTSA with the turbine manufacturer MHI for condition monitoring and maintenance of Pinjarra units. <p>We examined the recent combustion inspection report for the Pinjarra facility, which shows minimal wear and tear. The units show high availability and reliability performance statistics. These results are indicative of maintenance processes being applied as described above.</p> | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |

| No | Effectiveness Criteria | Findings | |
|------|---|---|---|
| 6(c) | Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule | <p>Through discussion with the General Manager Power Generation and Alcoa WA Operations CoGen Supervisor and consideration of Alcoa's eAM system, the Pinjarra Cogeneration Plant – AMP FY2018 - FY2022, Powerhouse Meeting Minutes and Oracle Work Order Tracking, we observed that:</p> <ul style="list-style-type: none"> • For each cogeneration facility major equipment, the eAM system contains plans for scheduled maintenance as well as required emergency and corrective works • All maintenance work undertaken is recorded in the eAM system • Alcoa's operational requirements lead to emergency and corrective works having the highest priority due to the impact on refinery production • Maintenance schedules are monitored • Alinta's maintenance philosophy for the cogeneration facilities is to systematically analyse production assets to ensure they are achieving business objectives • Maintenance strategies are reviewed on a yearly basis or when there are significant events that affect the assets • Section 6 and 7 of the AMP details the inspection history and key results of the Pinjarra cogeneration units. <p>We sighted examples of maintenance work order activity reports, which contain information on completion rates and overdue work orders categorised by priority.</p> | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 6(d) | Failures are analysed and operational/maintenance plans adjusted where necessary | <p>Through discussion with the General Manager Power Generation and Alcoa WA Operations CoGen Supervisor and examination of a TSA Outage Report and Scope of Works for Combustion Inspection Tender, we determined that:</p> <ul style="list-style-type: none"> • Failures are analysed and operational/maintenance plans are adjusted to reduce the likelihood of the failure to be repeated • Emergency and corrective actions were taken followed by a root cause analysis of the failure event such as a trip or fail-to-start • Where the failure required adjustments to the maintenance procedure, the adjustment was effected. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |

| No | Effectiveness Criteria | Findings | |
|------|--|---|--|
| 6(e) | Risk management is applied to prioritise maintenance tasks | <p>Through discussion with the General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, examination of Alinta Pinjarra’s Risk Register and Pinjarra Cogeneration Plant – AMP FY2018 - FY2022, and consideration of Alinta Pinjarra’s risk management and reporting framework, we determined that:</p> <ul style="list-style-type: none"> • All maintenance activities are based on a risk management approach, whereby the maintenance tasks addressing higher risk issues are performed first in order, followed by lower priority tasks • Daily meetings are used to arrange: <ul style="list-style-type: none"> ○ Daily work plans ○ Plans for upcoming work ○ Outage plans for major scheduled outages. • In relation to the major inspection of a “U1 Gas Turbine Rotor” initially scheduled for November/December 2017 and classified in the AMP as a medium risk, Alinta Pinjarra engaged MHI to assess whether the major inspection could be delayed. In April 2016, MHI concluded that it was possible for the critical rotor inspection to be delayed until the 3rd major inspection scheduled for 2023, enabling Alinta Pinjarra to make a decision not to purchase a replacement rotor • Although Alinta Pinjarra had demonstrated its assessment of risk in prioritising maintenance tasks, the impact of that decision had not been reflected in Alinta Pinjarra’s records of the risks and related treatments associated with the Unit 1 gas turbine rotor prior to and subsequent to the decision. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Opportunity for improvement (2) |
| | | Recommendation 4/2017 <i>Refer to 8(a) below.</i> | Action Plan 4/2017 <i>Refer to 8(a) below.</i> |
| 6(f) | Maintenance costs are measured and monitored. | <p>Through discussion with the General Manager Power Generation and the Finance Manager – Power Generation, and examination of the Pinjarra Cogeneration Plant – AMP FY2018 - FY2022, we determined that:</p> <ul style="list-style-type: none"> • Section 8 of the AMP outlines the OPEX commitments for Pinjarra Assets • The O&M Agreement requires Alcoa to provide Alinta Pinjarra with a monthly report detailing: <ul style="list-style-type: none"> ○ Maintenance costs incurred ○ Capital expenditure ○ Analysis of actual expenditure against budgeted expenditure • Alcoa’s reports are incorporated into Alinta Pinjarra’s monthly management reports • Significant variances between actual and budgeted expenditure are scrutinised by Alinta Finance staff, with the assistance of Alcoa personnel • Costs are allocated to assets automatically based on the work order and external costs are allocated to the relevant cost centre, which has relevant links to assets. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |

4.7 Asset management information system

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

Expected outcome: 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.

Overall Adequacy/Performance rating: Adequately defined (A) / Performing effectively (1)

| No | Effectiveness Criteria | Findings |
|------|--|---|
| 7(a) | Adequate system documentation for users and IT operators | <p>Through discussion with the IT Infrastructure and Security Manager and the Lead Engineering Planner and consideration of relevant Alinta and Alcoa system documentation, we determined that:</p> <ul style="list-style-type: none"> • Alcoa utilises the Oracle eAM computerised maintenance management system • Technical documentation for Alcoa's Oracle eAM application is managed and maintained through Alcoa's Oracle support arrangement with its Global Support Centre • Documents are stored in the Alcoa Performance Support System to provide document version control • User guides are kept up to date by the Alcoa Functional Support Representative and key users • Alinta Pinjarra monitors live plant performance through the Alinta Group's Honeywell Experion software • Alinta's IT policies are stored on Alinta's SharePoint site and are readily accessible for all users. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 7(b) | Input controls include appropriate verification and validation of data entered into the system | <p>Through discussion with the IT Infrastructure and Security Manager and consideration of relevant Alinta and Alcoa system documentation, we determined that:</p> <ul style="list-style-type: none"> • Input controls are managed through built-in checks in the Oracle eAM system and through additional manual processes • Processes are in place to verify and validate data entered into the eAM system, including: <ul style="list-style-type: none"> ○ Data reconciliation between old and new systems ○ Checking data transferred between one system to another is accurate, timely and complete ○ Validating data as close as possible to the point of origin, which includes the ability to trace data back to the source document. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 7(c) | Logical security access controls appear adequate, such as passwords | <p>Through discussion with the IT Infrastructure and Security Manager and consideration of relevant Alinta and Alcoa system documentation, we determined that:</p> <ul style="list-style-type: none"> • In relation to Alcoa's Oracle software, to which eAM belongs: <ul style="list-style-type: none"> ○ Alcoa's Security Access Policy (Australia) is based on Alcoa's global security standards as outlined in its Security Access Account Management Standard ○ Alcoa's logical security access is managed through the Alcoa's Access Request Facility (ARF) systems, where all users are assigned a unique user account and password |

| No | Effectiveness Criteria | Findings | |
|------|---|--|---|
| | | <ul style="list-style-type: none"> ○ Alcoa's account password requirements require a minimum of eight characters, which includes a mixture of alphabetical, numerical and special characters. Alcoa's security policy requires a user to change their password every 60 days ○ Passwords for the Oracle environment are synchronised to the Windows environment using a password management tool • In relation to the Alinta Group's Honeywell Experion software: <ul style="list-style-type: none"> ○ The process of granting and managing access is undertaken online through Alinta's IT helpdesk. Access requests are required to be approved by the relevant departmental head prior to being processed by IT ○ End-users are granted the minimum level of access privileges required to perform their job function and to prevent segregation of duties conflicts ○ Password requirements are maintained to authenticate user access to the Alinta network and the Honeywell Experion system, including a minimum number of characters, minimum specified types of characters and restrictions on the use of recent passwords. Alinta's group IT policy requires a user to change their password every 30 days. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 7(d) | Physical security access controls appear adequate | <p>Through discussion with the IT Infrastructure and Security Manager, consideration of relevant Alinta and Alcoa IT system supporting documentation and observations made during our visits to site and to Alinta's Perth office, we determined that:</p> <ul style="list-style-type: none"> • Processes and procedures relating to the access of facilities and the physical protection of information assets and systems are in use at Alcoa's and Alinta's Perth offices, as well as on site • Site access is restricted by security fencing and swipe card entry to the premises • General safety precautions are maintained to contain fire and other damaging events in computer rooms on site. <p>We determined that Alcoa has maintained the following physical security access controls over its data centre:</p> <ul style="list-style-type: none"> • Physical access to the data centre is restricted and logged through the use of swipe cards • Access cards are returned to Building Management and access is revoked on the termination of an employee • Access to the data centre is reviewed on a quarterly basis by the Alcoa Data Centre Manager • Visitors are required to be accompanied by appropriate IT personnel when entering the data centre. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 7(e) | Data backup procedures appear adequate and backups are tested | <p>Through discussion with the IT Infrastructure and Security Manager and consideration of relevant Alinta and Alcoa IT system supporting documentation, we determined that procedures for managing data backup and data restore of servers include:</p> <ul style="list-style-type: none"> • In relation to the Alinta Group's Honeywell Experion software: <ul style="list-style-type: none"> ○ The main on-site data centre (tier 1) is located in Adelaide ○ Nightly backups are performed through UNIX commands | |

| No | Effectiveness Criteria | Findings | |
|------|---|---|---|
| | | <ul style="list-style-type: none"> ○ Regular backups are performed in accordance with defined schedules and media rotation rules. A full backup is performed every weekday and a weekly backup is performed each Friday ○ Backup tapes are stored securely and protected from environmental harm and unauthorised access ○ End of calendar year and end of financial year backups are maintained indefinitely ○ Recall has been engaged to manage off-site backup tapes at a secure location ○ Testing of backups is performed on a quarterly basis, with archived emails being more commonly tested ○ Access to the backup tapes is limited to a sub-set of IT Operations personnel and examined quarterly ○ Data recovery and restoration procedures are periodically tested ● In relation to Alcoa’s Oracle software: <ul style="list-style-type: none"> ○ Backups of production data occur on a daily basis ○ EBS data, which includes eAM, is mirrored to another set of disks before being transferred to backup tapes overnight ○ Recall has been engaged to manage off-site backup tapes at a secure location ○ Data recovery and restoration procedures are periodically tested. We observed that Alcoa had tested its backup and system recovery processes (which include eAM data) during the review period. Results of those tests are integrated into the appendices of the relevant procedural documents (e.g. the “Application Recovery Plan – Enterprise Asset Management”). | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 7(f) | Key computations related to licensee performance reporting are materially accurate | Alinta Pinjarra’s asset management information system does not directly provide data used in any computation related to Alinta Pinjarra’s licence performance reporting. | |
| | | Adequacy Rating: Not rated | Performance Rating: Not rated |
| 7(g) | Management reports appear adequate for the licensee to monitor licence obligations. | <p>Through discussions with the IT Infrastructure and Security Manager, the Lead Engineering Planner and the Head of Asset Management and consideration of relevant supporting documentation and management reporting procedures, we determined that:</p> <ul style="list-style-type: none"> ● Management reports (i.e. weekly performance reports) are generated to provide performance information on plant operations and routine and first line intervention maintenance ● A daily generation report is produced for daily operator meetings on site and contains relevant information on the volume of MW hours produced and the quantity of fuel consumed ● The Finance team also prepares a monthly management pack to monitor costs from a financial perspective ● The Experion and Ellipse systems are capable of generating a variety of scheduled reports. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |

4.8 Risk management

Key process: Risk management involves the identification of risks and their management within an acceptable level of risk.

Expected outcome: An effective risk management framework is applied to manage risks related to the maintenance of service standards.

Overall Adequacy/Performance rating: Requires some improvement (B) / Opportunity for improvement (2)

| No | Effectiveness Criteria | Findings | |
|---------------------------|---|--|---|
| 8. Risk Management | | | |
| 8(a) | Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system | <p><i>Criteria 8(a) and (b)</i></p> <p>Through discussion with the General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, examination of Alinta Pinjarra's site risk register and consideration of Alinta Pinjarra's risk management and reporting framework, we determined that:</p> <ul style="list-style-type: none"> Alinta Energy's Enterprise Risk Management Framework applies throughout Alinta Energy's business structure, including Alinta Pinjarra's operations Alcoa also applies a structured, risk based approach to its O&M activities, performed in accordance with the O&M Agreement. In particular, all maintenance activities are based on Alcoa's risk management approach, whereby the maintenance tasks addressing higher risk issues are performed first in order, followed by lower priority tasks Although Alinta Pinjarra has applied the Alinta Energy group-wide risk management framework, it has not yet captured clear evidence of some of those risk management activities to demonstrate that its risk management philosophies and approach are consistently applied. For example, a consistent approach and timeframe has not been designed for preparing and reviewing risk treatment plans and reports, other than through the annual review of the AMP The AMP does not provide a clear and consistent reference to specific risk assessment and management activities, including preparation of risk treatment plans (which often result in allocation of capital expenditure) and links to insurer risk reduction recommendations. For example, in relation to Alinta Pinjarra's decision to extend the Unit 1 critical rotor inspection to be delayed until the 3rd major inspection in 2023, the impact of that decision (e.g. on other maintenance activity and cost forecasts) had not been reflected in Alinta Pinjarra's records of the risks associated with the Unit 1 gas turbine rotor prior to and subsequent to the decision The Pinjarra site risk register does not capture all risk elements identified through the contingency planning process (refer to Issue 5/2017) or the insurer risk reduction recommendations. | |
| 8(b) | Risks are documented in a risk register and treatment plans are actioned and monitored | <p>Adequacy Rating: Requires some improvement (B)</p> <p>Performance Rating: Opportunity for improvement (2)</p> | |
| | | <p>Recommendation 4/2017</p> <p>Alinta Pinjarra:</p> <p>(a) Establish a clear approach and timeframe for assessing risks, implementing treatment plans and monitoring status on a more frequent basis than the annual review of the AMP</p> <p>(b) Further develop its site Risk Register to include all risk elements relevant to its management of the power</p> | <p>Action Plan 4/2017</p> <p>Alinta Pinjarra will:</p> <p>(a) Establish a clear approach and timeframe for assessing risks, implementing treatment plans and monitoring status on a more frequent basis than the annual review of the AMP</p> <p>(b) Further develop its site Risk Register to include all risk elements relevant to management of the power</p> |

| No | Effectiveness Criteria | Findings | |
|------|---|---|--|
| | | station assets, including the contingency planning process and insurer risk reduction recommendations. | station assets, including the contingency planning process and insurer risk reduction recommendations. Responsible Person: Head of Asset Management and Alcoa WA Operations CoGen Supervisor Target Date: March 2018 |
| 8(c) | The probability and consequences of asset failure are regularly assessed. | <p>Through discussion with the Head of Asset Management, General Manager Power Generation and Alcoa WA Operations CoGen Supervisor, examination of Alinta Pinjarra's AMP and consideration of Alinta Pinjarra's asset planning and risk management practices, we determined that Alinta Pinjarra has applied the following mechanisms for identifying and assessing the consequence and likelihood of power station asset failure:</p> <ul style="list-style-type: none"> • The AMP is a major tool used for predicting the likelihood and consequences of asset failure. The AMP considers each major item of equipment and provides specific details of its operation and maintenance strategy and key lifecycle issues and remedial plans • During scheduled outages (e.g. long term shutdowns), main components of the plant are inspected for defects by Alcoa site staff and external contractors • Classified plant inspections are conducted in accordance with the statutory requirements imposed upon the plant • Condition monitoring techniques are employed on a frequent basis to identify defects, including: <ul style="list-style-type: none"> ○ Oil analysis ○ Vibration analysis ○ Radiography and thermography to identify any surface or internal defects • The management and maintenance of the plant assets is reviewed on a day-to-day basis at an operational level and on an annual basis, primarily through the review of the AMP • A high level of priority is accorded to minimising instances of asset failure and the duration of any such failure • The management structures, skills and resources assigned by Alinta Pinjarra and by Alcoa to the required asset management processes appear to be appropriate for enabling the regular assessment of the probability and consequences of asset failure. <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> | |

4.9 Contingency planning

Key process: Contingency plans document the steps to deal with the unexpected failure of an asset

Expected outcome: Contingency plans have been developed and tested to minimise any significant disruptions to service standards

Overall Adequacy/Performance rating: Requires some improvement (B) / Opportunity for improvement (2)

| No | Effectiveness Criteria | Findings |
|--------------------------------|--|---|
| 9. Contingency Planning | | |
| 9(a) | Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks. | <p>Alinta Pinjarra's O&M agreement with Alcoa includes provision for outages and emergencies, stating that Alcoa will take such action as may be reasonable and necessary to prevent, avoid or mitigate injury, damage or loss. As part of Alcoa's overall business continuity management framework, Alcoa has developed a series of system recovery plans, including black/brown start procedures for each powerhouse, in the event of a major failure of site assets or systems. Through discussion with the Alcoa Principal Mechanical Engineer WAO Powerhouse and examination of relevant supporting documentation, we observed that:</p> <ul style="list-style-type: none"> Alcoa's process provides for all relevant staff to be assessed for competency in performing brown and black start procedures on a six monthly basis. We sighted formal records of such competency assessments, which are captured in Alcoa's LMS training register Alcoa's powerhouse workforce is specifically resourced and trained to respond to powerhouse equipment losses, to minimise the interruption to operations System recovery plans are subject to a high-level review twice annually or when triggered by a major equipment change or reconfiguration. <p>Although Alcoa's plans and activities provide considerable support to Alinta Pinjarra's contingency planning arrangements, Alinta Pinjarra has the opportunity to consolidate the completeness and consistency of its contingency planning arrangements by capturing all of its plans and processes in one single reference. Such an approach would be consistent with Alinta Energy's Asset Management Framework. Currently, those contingency planning arrangements are maintained or described in different processes and documents, such as risk registers, supply contracts and Alcoa's system recovery plans and emergency response plans.</p> |
| | | <p>Adequacy Rating: Requires some improvement (B)</p> <p>Performance Rating: Opportunity for improvement (2)</p> |
| | <p>Recommendation 5/2017</p> <p>Alinta Pinjarra:</p> <p>(a) Establish a formal process for ensuring that contingency arrangements in place for all key risks to the power station's operations and availability (such as fuel and water supply) are rigorously challenged and tested</p> <p>(b) Prepare a clear overarching "umbrella" document to capture all contingency plans in place for each of the key risks to its assets' operations and availability.</p> | <p>Action Plan 5/2017</p> <p>Alinta Pinjarra will:</p> <p>(a) Establish a formal process for ensuring that contingency arrangements in place for all key risks to the power station's operations and availability are rigorously challenged and tested</p> <p>(b) Prepare a clear overarching "umbrella" document to capture all contingency plans in place for each of the key risks to Alinta Pinjarra's assets' operations and availability.</p> <p>Responsible Person: Head of Asset Management</p> <p>Target Date: March 2018</p> |

4.10 Financial planning

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

Expected outcome: A financial plan that is reliable and provides for the long-term financial viability of the services

Overall Adequacy/Performance rating: Adequately defined (A) / Performing effectively (1)

| No | Effectiveness Criteria | Findings |
|-------|---|---|
| 10(a) | The financial plan states the financial objectives and strategies and actions to achieve the objectives | <p>Through discussion with the Finance Manager – Power Generation and consideration of Alinta Pinjarra’s financial planning mechanisms, we observed that:</p> <ul style="list-style-type: none"> Alinta Pinjarra’s financial plan takes the form of an operational budget that is prepared on a rolling five year basis, reflecting its financial objectives and strategies that are driven by its contractual agreements for generation and supply of electricity and steam The financial plan puts together the financial elements of the plant’s operations to reflect its financial viability over the long term. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 10(b) | The financial plan identifies the source of funds for capital expenditure and recurrent costs | <p>Through discussion with the Finance Manager – Power Generation and consideration of Alinta Pinjarra’s financial planning mechanisms, we determined that operational cash flows are retained for budgeted maintenance and capital expenditure, based on retained funds or by submission through the Alinta Group corporate structure for non-budgeted expenditure.</p> |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 10(c) | The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) | <p>Through discussion with the Finance Manager – Power Generation and consideration of Alinta Pinjarra’s financial planning mechanisms, we determined that:</p> <ul style="list-style-type: none"> Alinta Pinjarra’s financial plan constitutes a summary of budgeted income and expenditure from the supply of electricity and steam under its contractual agreements, which is prepared and updated annually and includes a rolling forecast for the next five years An income statement and a position statement are prepared as part of consolidated financial statements on a six-monthly and annual basis. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 10(d) | The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period | <p>Through discussions with the Finance Manager – Power Generation and consideration of Alinta Pinjarra’s financial planning mechanisms, we observed that Alinta Pinjarra’s financial plan:</p> <ul style="list-style-type: none"> Is prepared on an annual basis and updated for the projections of income and expenses based on five year outage and maintenance schedules and also taking into account Consumer Price Index movements Includes a summary of planned capital expenditure projects for the next five years with a brief description of the intended purpose of the project Utilises an economic evaluation model as part of budgeting and forecasting process to assess the cost associated with the overall plant life and to generate cost predictions over the 40 years of plant life. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |

| No | Effectiveness Criteria | Findings | |
|-------|---|--|---|
| 10(e) | The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services | Through discussions with the Finance Manager – Power Generation and examination of Alinta Pinjarra’s financial plans for the four years relevant to this review, we observed that Alinta Pinjarra’s financial plans: <ul style="list-style-type: none"> • Provide a detailed monthly view of operational expenditure i.e. operations maintenance and administration expenses on a rolling five year basis • Include a summary of current and planned capital expenditure projects over the following five years, with a brief description of each project’s purpose and assumptions. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 10(f) | Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary. | Through discussions with the Finance Manager – Power Generation and examination of Alinta Pinjarra’s financial planning mechanisms, we observed that: <ul style="list-style-type: none"> • On a monthly basis, a variance analysis report is produced in a management package to: <ul style="list-style-type: none"> ○ Assess actual versus budgeted income and expenditure ○ Identify areas that are over budget or problematic and determine necessary corrective action • Finance holds quarterly discussions with site personnel to analyse site expenditure and determine whether forecast adjustments are required. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |

4.11 Capital expenditure planning

Key process: The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years. Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates

Expected outcome: 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

Overall Adequacy/Performance rating: Adequately defined (A) / Performing effectively (1)

| No | Effectiveness Criteria | Findings |
|-------|--|---|
| 11(a) | There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates | <p>Through discussions with the Financial Manager – Power Generation and consideration of Alinta Pinjarra’s capital planning procedures and examination of the capital plan (and supporting model) for the four years relevant to this review, we determined that:</p> <ul style="list-style-type: none"> • A capital expenditure plan is included in the annual financial plan • Capital expenditure planning is undertaken along with financial planning on a rolling five year basis • The plan provides information on the amount, purpose and description of budgeted capital expenditure • The plan also provides information on project responsibilities and the estimated dates of funds release. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 11(b) | The plan provides reasons for capital expenditure and timing of expenditure | <p>Through discussions with the Financial Manager – Power Generation, consideration of Alinta Pinjarra’s capital planning procedures and examination of the capital plan (and supporting model) for the four years relevant to this review, we determined that the capital expenditure plan outlines the:</p> <ul style="list-style-type: none"> • Details of the financial year in which the capital expenditure amount is planned • Reasons for the capital expenditure. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |
| 11(c) | The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan | <p>Through discussions with the Financial Manager – Power Generation, consideration of Alinta Pinjarra’s capital planning procedures and examination of the capital expenditure model for the four years relevant to this review, we determined that:</p> <ul style="list-style-type: none"> • Alinta Pinjarra’s procedures require lifecycle costs of assets to be assessed and recorded in the AMP for each major item of equipment, including key lifecycle issues, critical outages and operating & maintenance philosophy • The capital expenditure plan concurs with the assessed lifecycle costs of the plant’s assets. |
| | | <p>Adequacy Rating: Adequately defined (A) Performance Rating: Performing effectively (1)</p> |

| No | Effectiveness Criteria | Findings | |
|-------|---|---|---|
| 11(d) | There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned. | <p>Through discussions with the Financial Manager – Power Generation, consideration of Alinta Pinjarra’s capital planning procedures and examination of the capital plan (and supporting model) for the four years relevant to this review, we determined that:</p> <ul style="list-style-type: none"> • The capital expenditure budget is tracked on a monthly basis and any variances analysed to determine impact on the scheduled maintenance and outage plans • An economic evaluation model is utilised as part of budgeting and forecasting process to assess the cost associated with the overall plant life and to generate cost predictions over the 40 years of plant life • For non-budgeted capital expenditure, an application for expenditure is required to be made that evaluates the project rationale in conjunction with the economic evaluation model • On completion, the projects are reviewed against the approved criteria to test whether the project objectives were met • Daily site meetings are held at the plant to review the ongoing maintenance projects and schedules, including any relevant capital expenditure projects. Site liaises with the Finance team on a quarterly basis to update the expenditure models. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |

4.12 Review of Asset Management System

Key process: The asset management system is regularly reviewed and updated

Expected outcome: Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency

Overall Adequacy/Performance rating: Adequately defined (A) / Opportunity for improvement (2)

| No | Effectiveness Criteria | Findings | |
|-------|--|---|---|
| 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>Through discussion with the Head of Asset Management and General Manager Power Generation and review of Alinta's AMS documentation, we observed that:</p> <ul style="list-style-type: none"> • Since the last review (submitted in November 2013), Alinta has strengthened its AMS through refined policies and procedures and improved data recording and reporting mechanisms • The Pinjarra Power Station AMP, which is the main reference to the AMS, has been reviewed (and updated where necessary) on an annual basis. With the support of a designated Mechanical Engineer, the Manager, Asset Management and Engineering has the primary responsibility for that annual review, with the Executive Director Power Generation responsible for approving the revised version • Alinta Energy's Asset Management Framework provides for asset management activities to be subject to performance assessment and continuous improvement. | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Performing effectively (1) |
| 12(b) | Independent reviews (e.g. internal audit) are performed of the asset management system. | <p>Although components of Alinta Pinjarra's AMS are subject to regular review and update, Alinta Pinjarra has not applied a formal process for ensuring a sufficient degree of independence in any regular review of the asset management plan and underlying AMS (excluding this licence review).</p> | |
| | | Adequacy Rating: Adequately defined (A) | Performance Rating: Opportunity for improvement (2) |
| | | <p>Recommendation 6/2017</p> <p>In accordance with the Alinta Energy Asset Management Framework, Alinta Pinjarra implement:</p> <p>(a) The requirement for its AMS to be subject to an independent review on a regular basis</p> <p>(b) A register or record to capture the reviews conducted on its AMS and the independence of the associated reviewer.</p> | <p>Action Plan 6/2017</p> <p>Alinta Pinjarra will implement:</p> <p>(a) The requirement for its AMS to be subject to an independent review on a regular basis</p> <p>(b) A register or record to capture the reviews conducted on its AMS and the independence of the associated reviewer.</p> <p>Responsible Person: Head of Asset Management</p> <p>Target Date: August 2018</p> |

5 Follow-up of previous review action plans

| Reference (no./year) | (Asset management effectiveness rating/ AMS Component & Criteria / details of the issue) | Reviewer's Recommendation or action taken | Date Resolved | Further action required |
|--|---|--|---------------|-------------------------|
| A. Resolved before end of previous Review period | | | | |
| N/A - The 2013 AMS Review report did not contain any recommendations or action plans which were resolved before the end of the previous review period. | | | | |
| B. Resolved during current Review period | | | | |
| 1/2008 | <i>Asset Operations and Asset Maintenance</i> The 2008 review report detailed an action plan for Alinta to monitor Alcoa's integration of the Pinjarra cogeneration units into Alcoa's operations and maintenance system. | In conjunction with Alcoa, Alinta closed out the remaining OEM drawings for Unit 2, which were incorporated into Alcoa's maintenance drawing system. | June 2014 | N/A |
| 7/2008 | <i>Environmental Analysis</i> <i>4(c) Compliance with statutory and regulatory requirements</i> The 2008 review report detailed an action plan for Alinta to investigate, understand and comply with the statutory and regulatory noise level requirements for the Pinjarra cogeneration plant. | Alinta installed (with Alcoa's assistance) the analyser on unit 2. | June 2014 | N/A |
| 1/2013 | <i>Asset Planning</i> <i>1(b) Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning</i> Alinta has established a new plan called Pinjarra Power Station Strategic Asset Management Plan (SAMP). This plan is still in | The Pinjarra AMP is now formally reviewed and updated annually. | January 2014 | N/A |

| Reference (no./year) | (Asset management effectiveness rating/ AMS Component & Criteria / details of the issue) | Reviewer's Recommendation or action taken | Date Resolved | Further action required |
|--|---|--|---------------|--------------------------------|
| | draft and is replacing the previous Pinjarra Power Station Asset Life Plan. The SAMP has not been approved and presently is established as an uncontrolled copy without dissemination of information to the other personnel. | | | |
| C. Unresolved at end of current Review period | | | | |
| 6/2008 | <p><i>Asset Creation/Acquisition</i></p> <p><i>2(e) Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood</i></p> <p>The 2008 review report detailed an action plan for Alinta to establish and maintain a full record and understanding of its legal requirements as an electricity generation and transmission owner.</p> | Alinta converted the gap analysis into a scheduled action plan, then collated that information into a Compliance Manual, which remained in draft until August 2017, at which time it was finalised, approved and issued for compliance and monitoring. | August 2017 | No |
| 2/2013 | <p><i>Environmental Analysis</i></p> <p><i>4(c) Compliance with statutory and regulatory requirements</i></p> <p>Alinta utilise a Compliance Manual that appears to have minor errors. The manual has been reviewed but does not appear to have been finalised for distribution and compliance.</p> | The Compliance Manual remained in draft until August 2017, at which time it was finalised, approved and issued for compliance and monitoring. | August 2017 | No - refer to finding 2/2017. |
| 3/2013 | <p><i>Review of AMS</i></p> <p><i>12(b) Independent reviews (e.g. internal audit) are performed of the asset management system</i></p> <p>There is no independent review of the Asset Management System which Alinta referred to as the Pinjarra Power Station SAMP. This was recommended in the previous audit issue 3/10.</p> | <p><i>2013 recommendation</i></p> <p>The Licensee should ensure that an independent review/audit is conducted of the Asset Management System. This should be reflected in the Pinjarra Power Station SAMP as a documented requirement.</p> | N/A | Yes - refer to finding 6/2017. |

Appendix A – Review plan

**Alinta Cogeneration
Wagerup Pty Ltd.**

and

**Alinta Cogeneration
Pinjarra Pty Ltd.**

**Electricity Generation Licences
(EGL 6 – EGL 10)**

**2017 Asset Management System
Review**

Review Plan

August 2017

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1 Introduction

Overview

The Economic Regulation Authority (the **ERA**) has under the provisions of the Electricity Industry Act 2004 (**Electricity Act**), issued to Alinta Cogeneration Wagerup Pty Ltd (Alinta Wagerup) and Alinta Cogeneration Pinjarra Pty Ltd. (Alinta Pinjarra) (hereinafter together "**Alinta**") respectively the Electricity Generation Licence No.6 (EGL6) and Electricity Generation Licence No.10 (EGL10) (**the Licences**).

Section 14 of the Electricity Act requires Alinta to provide the ERA an asset management systems review (the **review**) conducted by an independent expert acceptable to the ERA not less than once in every 24-month period unless otherwise approved by the ERA. With the ERA's approval, Deloitte Risk Advisory Pty Ltd (**Deloitte**) has been appointed to conduct the review for the period 1 July 2013 to 30 June 2017 (**review period**).

The Licences relate to Alinta's operation of electricity generating works at its Wagerup and Pinjarra cogeneration facilities, which supply electricity to the South West Interconnected System (**SWIS**)

The Wagerup Power Station is a 380MW open cycle, gas fired gas turbine power plant located adjacent to Alcoa of Australia Ltd's (**Alcoa**) Wagerup refinery in South-West WA. The power station operates as a peaking power station.

The Pinjarra Power Station is a 285MW gas fuelled cogeneration plant located at Alcoa's Pinjarra refinery in South-West WA. The Pinjarra Power Station operates as a base load power station.

Alinta established Operations and Maintenance Agreements (**O&M Agreement**) with Alcoa for Alcoa to manage, operate and maintain the power stations on Alinta's behalf. The O&M Agreement for the Wagerup Power Station ceased on 2 May 2017, after which Alinta took up the responsibility for managing, operating and maintaining the power station.

The review will be conducted in accordance with the ERA's April 2014 issue of the Audit and Review Guidelines: Electricity and Gas Licences (**Review Guidelines**). In accordance with the Review Guidelines this document represents the Review Plan (the **Plan**) that is to be agreed upon by Deloitte and Alinta and presented to the ERA for approval.

The Plan has been developed in relation to both reviews (i.e. for the EGL6 and EGL10 Licences) and represents our approach in combining our work to assess both Licences concurrently. All references to 'review' assumes applicability to both Asset Management System reviews. Two separate review reports will be prepared, outlining the findings relevant to each Licence.

Objective

The objective of the review is to independently examine the effectiveness and performance of the respective asset management systems established for assets subject to Alinta's Licences during the review period.

Scope

In accordance with the Review Guidelines, the review will consider the effectiveness of Alinta's existing control procedures within the 12 key processes in the asset management life-cycle as outlined below at Table 1. Each key process and effectiveness criteria is applicable to Alinta's Licences and as such will be individually considered as part of the review.

Table 1 – Asset management system key processes and effectiveness criteria

| # | Key processes | Effectiveness criteria |
|---|--|--|
| 1 | Asset planning | <ul style="list-style-type: none"> Asset management plan covers key requirements Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning Service levels are defined Non-asset options (e.g. demand management) are considered Lifecycle costs of owning and operating assets are assessed Funding options are evaluated Costs are justified and cost drivers identified Likelihood and consequences of asset failure are predicted Plans are regularly reviewed and updated. |
| 2 | Asset creation and acquisition | <ul style="list-style-type: none"> Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions Evaluations include all life-cycle costs Projects reflect sound engineering and business decisions Commissioning tests are documented and completed Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood. |
| 3 | Asset disposal | <ul style="list-style-type: none"> Under-utilised and under-performing assets are identified as part of a regular systematic review process The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken Disposal alternatives are evaluated There is a replacement strategy for assets. |
| 4 | Environmental analysis (all external factors that affect the system) | <ul style="list-style-type: none"> Opportunities and threats in the system environment are assessed Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved Compliance with statutory and regulatory requirements Achievement of customer service levels. |
| 5 | Asset operations | <ul style="list-style-type: none"> Operational policies and procedures are documented and linked to service levels required Risk management is applied to prioritise operations tasks Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural condition and accounting data Operational costs are measured and monitored Staff resources are adequate and staff receive training commensurate with their responsibilities. |
| 6 | Asset maintenance | <ul style="list-style-type: none"> Maintenance policies and procedures are documented and linked to service levels required Regular inspections are undertaken of asset performance and condition Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule Failures are analysed and operational/maintenance plans adjusted where necessary Risk management is applied to prioritise maintenance tasks Maintenance costs are measured and monitored. |

| # | Key processes | Effectiveness criteria |
|----|-------------------------------------|--|
| 7 | Asset management information system | <ul style="list-style-type: none"> • Adequate system documentation exists for users and IT operators • Input controls include appropriate verification and validation of data entered into the system • Logical security access controls appear adequate, such as passwords • Physical security access controls appear adequate • Data backup procedures appear adequate and backups are tested • Key computations related to licensee performance reporting are materially accurate • Management reports appear adequate for the licensee to monitor licence obligations. |
| 8 | Risk management | <ul style="list-style-type: none"> • Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system • Risks are documented in a risk register and treatment plans are actioned and monitored • The probability and consequences of asset failure are regularly assessed. |
| 9 | Contingency planning | <ul style="list-style-type: none"> • Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks. |
| 10 | Financial planning | <ul style="list-style-type: none"> • The financial plan states the financial objectives and strategies and actions to achieve the objectives • The financial plan identifies the source of funds for capital expenditure and recurrent costs • The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) • The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period • The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services • Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary. |
| 11 | Capital expenditure planning | <ul style="list-style-type: none"> • There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates • The plan provides reasons for capital expenditure and timing of expenditure • The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan • There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned. |
| 12 | Review of Asset Management System | <ul style="list-style-type: none"> • A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current • Independent reviews (e.g. internal audit) are performed of the asset management system. |

Alinta's responsibility for maintaining an effective asset management system

Alinta is responsible for putting in place policies, procedures and controls, which are designed to provide for an effective asset management system for assets subject to the Licences.

Deloitte's responsibility

Our responsibility is to express a conclusion on the effectiveness of Alinta's asset management systems to meet Licence requirements based on our procedures. The engagement will be conducted in accordance with Australian Standard on Assurance Engagements (**ASAE**) 3500 Performance

Engagements issued by the Australian Auditing and Assurance Standards Board and the Guidelines, to state whether, in all material respects, based on the work performed, anything has come to our attention to indicate that Alinta had not established and maintained an effective asset management system for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines and the systems have not operated effectively for the period 1 July 2013 to 30 June 2017. These standards also require us to comply with the relevant ethical requirements of the Australian professional accounting bodies. Our engagement provides limited assurance as defined in ASAE 3500.

Limitations of use

Our reports will be produced solely for the information and internal use of Alinta, and is not intended to be and should not be used by any other person or entity. No other person or entity is entitled to rely, in any manner or for any purpose, on the reports.

We understand that a copy of our reports will be provided to the ERA for the purpose of meeting Alinta's reporting requirements of section 14 of the Act. We agree that a copy of our reports may be provided to the ERA for its information in connection with this purpose, but only on the basis that we accept no duty, liability or responsibility to the ERA in relation to the report. We accept no duty, responsibility or liability to any party, other than Alinta, in connection with the reports or this engagement.

Inherent limitations

A limited assurance engagement is substantially less in scope than a reasonable assurance engagement conducted in accordance with ASAE 3500 and consequently does not allow us to obtain assurance that we would become aware of all significant matters that might be identified in a reasonable assurance engagement. Accordingly, we will not express an opinion providing reasonable assurance. We cannot, in practice, examine every activity and procedure, nor can we be a substitute for management's responsibility to maintain adequate controls over all levels of operations and their responsibility to prevent and detect irregularities, including fraud. Accordingly, readers of our reports should not rely on the reports to identify all potential opportunities for improvement which may be required. Any projection of the evaluation of the level of effectiveness to future periods is subject to the risk that the systems may become inadequate because of changes in conditions, or that the degree of effectiveness with management procedures may deteriorate.

Independence

In conducting our engagement, we will comply with the independence requirements of the Australian professional accounting bodies.

2 Approach

The review will be conducted in three distinct phases, being a risk assessment, system analysis/policy and procedure review and examination of performance. From the review results, a report will be produced to outline findings, overall assessments and recommendations for improvement in line with the Review Guidelines. Each step of the review is discussed in detail below.

Risk assessment

The review will focus on identifying or assessing those activities and management control systems to be examined and the matters subject to review. Therefore, the purpose of conducting the risk assessment as a preliminary phase enables the reviewer to focus on pertinent/high risk areas of Alinta’s asset management systems established for the assets subject to the Licence. The risk assessment gives specific consideration to changes to Alinta’s systems and processes and any matters of significance raised by the ERA and/or Alinta. The level of risk and materiality of the process determine the level of review required i.e. the greater the materiality and the higher the risk, the more effort will be applied.

The first step of the risk assessment is the rating of the potential consequences of Alinta not effectively maintaining an asset management system for the assets subject to its Licences, in the absence of mitigating controls. The consequence rating descriptions listed at Table 10 of the Review Guidelines (refer to **Appendix 1-1**), provides the risk assessment with context to enable the appropriate consequence rating to be applied to each component of the asset management system subject to review.

Once the consequence has been determined, the likelihood of Alinta not maintaining an asset management system for the assets subject to its Licences (with reference to the defined effectiveness criteria) is assessed using the likelihood rating listed at Table 16 of the Review Guidelines (refer to **Appendix 1-2**). The assessment of likelihood is based on the expected frequency of non-performance against the defined criteria, over a period of time.

Table 2 below (sourced from Table 17 of the Review Guidelines) outlines the combination of consequence and likelihood ratings to determine the level of inherent risk associated with each individual effectiveness criteria.

Table 2: Inherent risk rating

| | Consequence | | |
|------------|-------------|----------|-------|
| Likelihood | Minor | Moderate | Major |
| Likely | Medium | High | High |
| Probable | Low | Medium | High |
| Unlikely | Low | Medium | High |

Once the level of inherent risk has been determined, the adequacy of existing controls is assessed in order to determine the level of control risk. Controls are assessed and prioritised as weak, moderate or strong dependant on their suitability to mitigate the risks identified. The control adequacy ratings used by this risk assessment are aligned to the ratings listed at Table 19 of the Review Guidelines (refer to **Appendix 1-3**).

Once inherent risks and control risks are established, the review priority can then be determined using the matrix listed at Table 20 of the Review Guidelines (refer to **Table 3** below). Essentially, the higher the level of risk the greater the level of examination is required.

Table 3: Assessment of Review Priority

| | Adequacy of existing controls | | |
|---------------|-------------------------------|-------------------|--------|
| Inherent Risk | Weak | Moderate | Strong |
| High | Review priority 1 | Review priority 2 | |
| Medium | Review priority 3 | Review priority 4 | |
| Low | Review priority 5 | | |

The following table outlines the review requirement for each level of review priority. Testing can range from extensive substantive testing around the controls and activities of particular processes (including physical inspection of asset infrastructure, which will be given greater attention for those processes with a review priority of 1, 2 or 3) to confirming the existence of controls through discussions with relevant staff. Review procedures to be performed will be selected from those procedures included in *Table 1: Example of possible audit procedures for each audit priority* of the Guidelines.

Table 4: Review Priority Table

| Priority Rating and Resulting Review Procedures | |
|---|--|
| Rating | Review requirement |
| Priority 1 | <ul style="list-style-type: none"> • Controls testing and extensive substantive testing of activities • Follow-up and if necessary, re-test matters previously reported. |
| Priority 2 | <ul style="list-style-type: none"> • Controls testing and moderate substantive testing of activities • Follow-up and if necessary, re-test matters previously reported. |
| Priority 3 | <ul style="list-style-type: none"> • Limited controls testing (moderate sample size). Only substantively test activities if further control weakness found • Follow-up of matters previously reported. |
| Priority 4 | <ul style="list-style-type: none"> • Confirmation of existing controls via observation and walk through testing • Follow-up of matters previously reported. |
| Priority 5 | <ul style="list-style-type: none"> • Confirmation of existing controls via observation, discussions with key staff and/or reliance on key references ("desktop review"). |

The risk assessment has been discussed with stakeholders to gain their input as to the appropriateness and factual accuracy of risk and control ratings and associated explanations. The key sources considered in reaching our preliminary assessment of the risk and control ratings were:

- Prior assessments of the state of controls during preliminary discussions with Alinta representatives
- Our understanding of Alinta's assets and internal processes
- Our understanding of the electricity industry and regulatory environment
- Any other factors that may have an effect on the level of risk or strength of controls.

At this stage, the risk assessment can only be a preliminary assessment based on reading of documentation and interviews by the reviewers. It is possible that the ratings and risk assessment comments may be revised as we conduct our work and new evidence comes to light. Accordingly, the risk assessment for the asset management system review is a preliminary draft, not a final report, and no reliance should be placed on its findings. It is however an invaluable tool for focussing the review effort.

The asset management system review risk assessment is attached at **Appendix 2**.

Systems analysis/walkthrough

The level of policy and procedure review required will be determined utilising the aforementioned priority scale. Once the priority level has been defined, the review will consist of:

- Interviewing key operational and administrative staff responsible for the development and maintenance of policies and procedural type documentation
- Examination of documented policies and procedures for key functional requirements and consideration of their relevance to Alinta's asset management system requirements and standards.

The policy and procedure definition element of the asset management system review will be performed to provide a rating as defined under Table 5 (refer below).

Key documents which may be subject to review are not specifically disclosed in this plan. A list of documents examined will be included in the review reports.

Examination of performance

The actual performance of the relevant controls and processes in place will then be examined via:

- Consideration of reports and references evidencing activity
- Interviews with key operational staff
- Physical visits to the Wagerup and Pinjarra power stations
- Consideration of Alinta’s management of planned outage rates
- Consideration of the level of staff resourcing applied to maintaining those controls and processes
- Consideration of each installation’s function, normal modes of operation and age.

A full work program will be completed to record the specific aspects of our review and examination of the performance of each asset management system key process. This work program will be based on:

- The review priority determined by the risk assessment to be applicable to each effectiveness criteria
- The results of the policy and procedure review, as described above
- The location of personnel and activity to be tested.

The performance effectiveness element of the asset management system review will be performed to provide a rating as defined under **Table 6** (refer below).

Reporting

In accordance with the Review Guidelines, the reviewer must provide an assessment of both the process and policy definition rating (refer to **Table 5** below and also **Table 8** of the Review Guidelines) and the performance rating (refer to **Table 6** below and also **Table 9** of the Review Guidelines) for each of the key processes in Alinta’s asset management system.

Table 5: 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). |
| C | Requires significant improvement | <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 6: Asset management performance ratings

| 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. |

The asset management review report will be structured to address all key components expected by the Review Guidelines, including:

- Response to previous review recommendations (refer to **Appendix 3**)
- Performance summary and rating for each effectiveness criteria (Table 1), utilising the asset management process and policy definition adequacy ratings (Table 5) and the asset management performance ratings (Table 6)
- Review observations for each effectiveness criteria
- Status and response to recommendations from the previous review
- Where appropriate, recommendations on actions required to address opportunities for improvement or process deficiencies.

Where appropriate, Alinta will provide a post review implementation plan for incorporation into the report as an appendix.

3 General information

All aspects of the review will undergo quality assurance and review procedures as outlined in our previous communications. Before delivery of a final report, full quality procedures will be applied, including second partner review.

Key Alinta contacts

The key contacts for this review are:

- Alinta Energy General Manager East Coast and SWIS O&M
- Alinta Energy Wagerup Power Station Manager
- Alinta Energy Manager, Asset Management & Engineering
- Alinta Energy Finance Manager – Power Generation
- Alinta Energy Lead Engineering Planner
- Alinta Energy Ellipse Team Leader
- Alinta Energy Manager Regulatory Compliance
- Alinta Energy Alinta Wholesale Regulation Manager

Key Alcoa contacts

- WAO Principal Mechanical Engineer
- WAO Principal Electrical Engineer
- WAO Powerhouse Manager.

Deloitte staff

Deloitte staff who will be involved with this assignment are:

- Richard Thomas Partner
- Andrew Baldwin Specialist Leader, Regulatory Compliance
- David Herbert Senior Analyst
- Manuela Cervellera Senior Analyst
- Emlyn King Senior Compliance Specialist
- Bryn Durrans Manager (Engineer)
- Kobus Beukes QA Partner
- Shailesh Tyagi Technical QA Lead.

Resumes for key Deloitte staff are outlined in the proposal accepted by Alinta and subsequently presented to the ERA.

Timing

The initial risk assessment phase was completed on 31 July 2017 after which the review plan and detailed risk assessment were presented to the ERA for review and comment. The remainder of the fieldwork phase is scheduled to be performed in August and early September 2017.

Deloitte's time and staff commitment to the completion of the review is outlined in the proposal accepted by Alinta and subsequently presented to the ERA. In summary, the estimated time allocated to each activity is as follows:

- Planning (including risk assessment): 16 hours
- Fieldwork (including system analysis/policy & procedure review and examination of performance): 100 hours
- Reporting: 34 hours.

Site visits

The review will include a physical site visit by Deloitte's Engineer and Technical Specialist to the Wagerup and Pinjarra power stations.

Appendix 1 - Risk assessment key

Appendix 1 – 1 Consequence ratings

Source: Review Guidelines – Electricity and Gas Licences April 2014

| Examples of non-compliance | | | |
|----------------------------|--|---|---|
| Rating | Supply quality and reliability | Consumer protection | Breaches of legislation or other licence conditions |
| Minor | <p>Breaches of supply quality or reliability standards - affecting a small number of customers.</p> <p>Delays in providing a small proportion of new connections.</p> | <p>Customer complaints procedures not followed in a few instances.</p> <p>Small percentage of disconnections or reconnections not completed on time.</p> <p>Small percentage of bills not issued on time.</p> | <p>Legislative obligations or licence conditions not fully complied with, minor impact on customers or third parties.</p> <p>Compliance framework generally fit for purpose and operating effectively.</p> |
| Moderate | <p>Supply quality breach events that significantly impact customers; large number of customers affected and/or extended duration and/or damage to customer equipment.</p> <p>Supply interruptions affecting significant proportion of customers on the network for up to one day.</p> <p>Significant number of customers experiencing excessive number of interruptions per annum.</p> <p>Significant percentage of new connections not provided on time/ some customers experiencing extended delays.</p> | <p>Significant percentage of complaints not being correctly handled.</p> <p>Customers not receiving correct advice regarding financial hardship.</p> <p>Significant percentage of bills not issued on time.</p> <p>Ongoing instances of disconnections and reconnections not completed on time, remedial actions not being taken or proving ineffective. Instances of wrongful disconnection.</p> | <p>More widespread breaches of legislative obligations or licence conditions over time.</p> <p>Compliance framework requires improvement to meet minimum standards.</p> |
| Major | <p>Supply interruptions affecting significant proportion of customers on the network for more than one day.</p> <p>Majority of new connections not completed on time/ large number of customers experiencing extended delays.</p> | <p>Significant failure of one or more customer protection processes leading to ongoing breaches of standards.</p> <p>Ongoing instances of wrongful disconnection</p> | <p>Wilful breach of legislative obligation or licence condition.</p> <p>Widespread and/or ongoing breaches of legislative obligations or licence conditions.</p> <p>Compliance framework not fit for purpose, requires significant improvement.</p> |

Appendix 1 – 2 Likelihood ratings

Source: Review Guidelines – Electricity and Gas Licences April 2014

| Level | Criteria |
|----------|---|
| Likely | Non-compliance is expected to occur at least once or twice a year. |
| Probable | Non-compliance is expected to occur every three years. |
| Unlikely | Non-compliance is expected to occur at least once every 10 years or longer. |

Appendix 1 – 3 Adequacy ratings for existing controls

Source: Review Guidelines – Electricity and Gas Licences April 2014

| Rating | Description |
|----------|---|
| Strong | Strong controls that are sufficient for the identified risks. |
| Moderate | Moderate controls that cover significant risks; improvement possible. |
| Weak | Controls are weak or non-existent and have minimal impact on the risks. |

Appendix 2 – Risk assessment

| 1 | | Asset Planning | | | | |
|---------------------|--|---|------------|----------------------|---------------------|-----------------|
| Key Process: | | Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price). | | | | |
| Outcome: | | 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. | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 1(a) | Asset management plan covers key requirements | Moderate | Probable | Medium | Moderate | Priority 4 |
| 1(b) | Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning | Minor | Probable | Low | Moderate | Priority 5 |
| 1(c) | Service levels are defined | Minor | Unlikely | Low | Moderate | Priority 5 |
| 1(d) | Non-asset options (e.g. demand management) are considered | Minor | Unlikely | Low | Moderate | Priority 5 |
| 1(e) | Lifecycle costs of owning and operating assets are assessed | Moderate | Probable | Medium | Moderate | Priority 4 |
| 1(f) | Funding options are evaluated | Minor | Probable | Low | Moderate | Priority 5 |
| 1(g) | Costs are justified and cost drivers identified | Minor | Probable | Low | Moderate | Priority 5 |
| 1(h) | Likelihood and consequences of asset failure are predicted | Major | Probable | High | Moderate | Priority 2 |
| 1(i) | Plans are regularly reviewed and updated | Minor | Unlikely | Low | Moderate | Priority 5 |

| 2 | | Asset Creation and Acquisition | | | | |
|---------------------|---|--|------------|----------------------|---------------------|-----------------|
| Key Process: | | Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay | | | | |
| Outcome: | | A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery. | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 2(a) | Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions | Moderate | Unlikely | Medium | Moderate | Priority 4 |
| 2(b) | Evaluations include all life-cycle costs | Moderate | Unlikely | Medium | Moderate | Priority 4 |
| 2(c) | Projects reflect sound engineering and business decisions | Moderate | Unlikely | Medium | Moderate | Priority 4 |
| 2(d) | Commissioning tests are documented and completed | Moderate | Unlikely | Medium | Moderate | Priority 4 |
| 2(e) | Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood | Moderate | Unlikely | Medium | Moderate | Priority 4 |

| 3 | | Asset Disposal | | | | |
|---------------------|--|--|------------|----------------------|---------------------|-----------------|
| Key Process: | | Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms. | | | | |
| Outcome: | | Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs. | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 3(a) | Under-utilised and under-performing assets are identified as part of a regular systematic review process | Minor | Unlikely | Low | Moderate | Priority 5 |
| 3(b) | The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken | Minor | Unlikely | Low | Moderate | Priority 5 |
| 3(c) | Disposal alternatives are evaluated | Minor | Unlikely | Low | Moderate | Priority 5 |
| 3(d) | There is a replacement strategy for assets | Minor | Unlikely | Low | Moderate | Priority 5 |

| 4 | | Environmental analysis | | | | |
|---------------------|---|---|------------|----------------------|---------------------|-----------------|
| Key Process: | | Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system. | | | | |
| Outcome: | | The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements. | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 4(a) | Opportunities and threats in the system environment are assessed | Major | Probable | High | Moderate | Priority 2 |
| 4(b) | Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved | Moderate | Probable | Medium | Moderate | Priority 4 |
| 4(c) | Compliance with statutory and regulatory requirements | Moderate | Probable | Medium | Weak | Priority 3 |
| 4(d) | Achievement of customer service levels | Moderate | Probable | Medium | Moderate | Priority 4 |

| 5 | | Asset operations | | | | |
|---------------------|--|---|------------|----------------------|---------------------|-----------------|
| Key Process: | | Operational functions relate to the day-to-day running of assets and directly affect service levels and costs. | | | | |
| Outcome: | | Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved. | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 5(a) | Operational policies and procedures are documented and linked to service levels required | Moderate | Probable | Medium | Moderate | Priority 4 |
| 5(b) | Risk management is applied to prioritise operations tasks | Moderate | Probable | Medium | Moderate | Priority 4 |
| 5(c) | 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 | Moderate | Probable | Medium | Moderate | Priority 4 |
| 5(d) | Operational costs are measured and monitored | Moderate | Probable | Medium | Moderate | Priority 4 |
| 5(e) | Staff resources are adequate and staff receive training commensurate with their responsibilities | Moderate | Probable | Medium | Moderate | Priority 4 |

| 6 | Asset maintenance | | | | | |
|---------------------|--|-------------|------------|----------------------|---------------------|-----------------|
| Key Process: | Maintenance functions relate to the upkeep of assets and directly affect service levels and costs. | | | | | |
| Outcome: | Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost. | | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 6(a) | Maintenance policies and procedures are documented and linked to service levels required | Major | Probable | High | Moderate | Priority 2 |
| 6(b) | Regular inspections are undertaken of asset performance and condition | Major | Probable | High | Moderate | Priority 2 |
| 6(c) | Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule | Major | Probable | High | Moderate | Priority 2 |
| 6(d) | Failures are analysed and operational/maintenance plans adjusted where necessary | Major | Probable | High | Moderate | Priority 2 |
| 6(e) | Risk management is applied to prioritise maintenance tasks | Major | Probable | High | Moderate | Priority 2 |
| 6(f) | Maintenance costs are measured and monitored | Moderate | Probable | Medium | Moderate | Priority 4 |

| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
|---------------------|--|-------------|------------|----------------------|---------------------|-----------------|
| 7 | Asset Management Information System | | | | | |
| Key Process: | An asset management information system is a combination of processes, data and software that support the asset management functions. | | | | | |
| Outcome: | 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(a) | Adequate system documentation for users and IT operators | Minor | Probable | Low | Moderate | Priority 5 |
| 7(b) | Input controls include appropriate verification and validation of data entered into the system | Minor | Probable | Low | Moderate | Priority 5 |
| 7(c) | Logical security access controls appear adequate, such as passwords | Minor | Probable | Low | Moderate | Priority 5 |
| 7(d) | Physical security access controls appear adequate | Minor | Probable | Low | Moderate | Priority 5 |
| 7(e) | Data backup procedures appear adequate and backups are tested | Moderate | Probable | Medium | Moderate | Priority 4 |
| 7(f) | Key computations related to licensee performance reporting are materially accurate | Minor | Unlikely | Low | Moderate | Priority 5 |
| 7(g) | Management reports appear adequate for the licensee to monitor licence obligations | Minor | Probable | Low | Moderate | Priority 5 |

| 8 | | Risk Management | | | | |
|---------------------|---|---|------------|----------------------|---------------------|-----------------|
| Key Process: | | Risk management involves the identification of risks and their management within an acceptable level of risk. | | | | |
| Outcome: | | An effective risk management framework is applied to manage risks related to the maintenance of service standards | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 8(a) | Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system | Major | Probable | High | Moderate | Priority 2 |
| 8(b) | Risks are documented in a risk register and treatment plans are actioned and monitored | Moderate | Probable | Medium | Moderate | Priority 4 |
| 8(c) | The probability and consequences of asset failure are regularly assessed | Major | Probable | High | Moderate | Priority 2 |

| 9 | | Contingency Planning | | | | |
|---------------------|--|--|------------|----------------------|---------------------|-----------------|
| Key Process: | | Contingency plans document the steps to deal with the unexpected failure of an asset. | | | | |
| Outcome: | | Contingency plans have been developed and tested to minimise any significant disruptions to service standards. | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 9(a) | Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks | Major | Probable | High | Moderate | Priority 2 |

| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
|---------------------|--|-------------|------------|----------------------|---------------------|-----------------|
| 10 | Financial Planning | | | | | |
| Key Process: | The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term. | | | | | |
| Outcome: | A financial plan that is reliable and provides for the long-term financial viability of the services. | | | | | |
| 10(a) | The financial plan states the financial objectives and strategies and actions to achieve the objectives | Minor | Probable | Low | Moderate | Priority 5 |
| 10(b) | The financial plan identifies the source of funds for capital expenditure and recurrent costs | Minor | Probable | Low | Moderate | Priority 5 |
| 10(c) | The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) | Minor | Probable | Low | Moderate | Priority 5 |
| 10(d) | The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period | Minor | Probable | Low | Moderate | Priority 5 |
| 10(e) | The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services | Moderate | Probable | Medium | Moderate | Priority 4 |
| 10(f) | Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary | Moderate | Probable | Medium | Moderate | Priority 4 |

| 11 | | Capital expenditure planning | | | | |
|---------------------|---|------------------------------|------------|----------------------|---------------------|-----------------|
| Key Process: | The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years. Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates | | | | | |
| Outcome: | 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. | | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 11(a) | There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates | Moderate | Probable | Medium | Moderate | Priority 4 |
| 11(b) | The plan provides reasons for capital expenditure and timing of expenditure | Minor | Probable | Low | Moderate | Priority 5 |
| 11(c) | The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan | Moderate | Probable | Medium | Moderate | Priority 4 |
| 11(d) | There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned | Minor | Probable | Low | Moderate | Priority 5 |

| 12 | | Review of AMS | | | | |
|---------------------|--|---------------|------------|----------------------|---------------------|-----------------|
| Key Process: | The asset management system is regularly reviewed and updated. | | | | | |
| Outcome: | Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency. | | | | | |
| Ref | Effectiveness criteria | Consequence | Likelihood | Inherent risk rating | Controls assessment | Review priority |
| 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 | Minor | Probable | Low | Moderate | Priority 5 |
| 12(b) | Independent reviews (eg internal audit) are performed of the asset management system | Minor | Probable | Low | Weak | Priority 5 |

Appendix 3 – Previous review recommendations

| | |
|---|---|
| <p>Issue 1/2013 (Wagerup and Pinjarra)</p> <p><u>Asset Planning</u></p> <p><u>1(b) Does the planning process and objectives reflect the need of all stakeholders and is it integrated with business planning?</u></p> <p>Alinta has established a new plan called Wagerup/Pinjarra Power Station Strategic Asset Management Plan (SAMP). This plan is still in draft and is replacing the previous Wagerup Power Station Asset Life Plan. The SAMP has not been approved and presently is established as an uncontrolled copy without dissemination of information to the other personnel.</p> | |
| <p>Recommendation 1/2013</p> <p>The Wagerup/Pinjarra Power Station SAMP needs to be approved and disseminated. A reporting system is to be established to measure and monitor actual against the plans.</p> | <p>Action plan 1/2013</p> <p>Alinta will complete the approval process of the Wagerup/Pinjarra Power Station SAMP and implement accordingly.</p> <p><i>Auditor Comment:</i> (Unverified confirmation of completion of this action was provided after the close of this audit. <u>Outstanding ACTION is verification only.</u></p> <p>Responsible person Alinta Energy Asset Engineering Manager</p> <p>Target date November 2013</p> |
| <p>Issue 2/2013 (Wagerup and Pinjarra)</p> <p><u>Environmental Analysis</u></p> <p><u>4(c) Compliance with statutory and regulatory requirements</u></p> <p>Alinta utilise a Compliance Manual that appears to have minor errors. The manual has been reviewed but does not appear to have been finalised for distribution and compliance.</p> | |
| <p>Recommendation 2/2013</p> <p>The compliance manual needs to be audited for accuracy, approved and issued for compliance and monitoring</p> | <p>Action Plan 2/2013</p> <p>Alinta to finalise and formally approve the Compliance Manual with monitoring facility in place.</p> <p>Responsible Person Alinta Energy Manager Generation Operations WA</p> <p>Target Date November 2013</p> |

| | |
|---|---|
| <p>Issue 3/2013 (Wagerup and Pinjarra) <u>Review of AMS</u> <u>12(b) Are independent reviews (e.g. internal audit) of the asset management system reviewed?</u> There is no independent review of the Asset Management System which Alinta referred to as the Wagerup/Pinjarra Power Station SAMP. This was recommended in the previous audit issue 3/10.</p> | |
| <p>Recommendation 3/2013 The Licensee should ensure that an independent review/audit is conducted of the Asset Management System. This should be reflected in the Wagerup/Pinjarra Power Station SAMP as a documented requirement.</p> | <p>Action Plan 3/2013 Alinta to schedule an independent review/audit of the Wagerup/Pinjarra Power Station SAMP. Alinta to update audit/review process in the Wagerup/Pinjarra Power Station SAMP. <i>Auditor comment:</i> <i>(Unverified confirmation that previous independent audit of the SAMP was carried out FY2012 and is rescheduled for FY2014 was provided after the close of this audit. Outstanding ACTION is verification only).</i> Responsible Person Alinta Energy Asset Engineering Manager Target Date November 2013</p> |
| <p>Issue 3/2008 (Wagerup) <u>All elements</u> <i>Status: In progress at the time of the 2013 AMS review</i></p> | |
| <p>Recommendation 3/2008 Integration of Alinta Wagerup cogeneration units into Alcoa’s regular operations and maintenance systems be given more urgency to address the long term sustainability of the units’ availability and reliability.</p> | <p>Revised Action Plan 3/2008 Alinta continue to work with Alcoa for the integration of the Wagerup cogeneration units to Alcoa’s operations and maintenance systems. The highest risk areas are being actioned as a priority. Responsible Person Alinta Energy Asset Engineering Manager Target Date Six monthly basis until completion</p> |
| <p>Issue 8/2008 (Wagerup) <u>Asset Operations</u> <u>5(a) Operational policies and procedures are documented and linked to service levels required</u> <i>Status: In progress at the time of the 2013 AMS review</i></p> | |
| <p>Recommendation 8/2008 (Wagerup) Alinta prioritise and fund the development of operational policies procedures for auxiliary equipment.</p> | <p>Revised Action Plan 8/2008 (Wagerup) Alinta will monitor Alcoa’s progress for the development of operational procedures to ensure staged completion in accordance with priorities. Responsible Person Alinta Energy Asset Engineering Manager Target Date June 2014</p> |

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| <p>Issue 1/2008 (Pinjarra) <u>Asset Operations and Asset Maintenance</u> <i>Status: In progress at the time of the 2013 AMS review</i></p> | |
| <p>Recommendation 1/2008 (Pinjarra) The 2008 review report detailed an action plan for Alinta to monitor Alcoa's integration of the Pinjarra cogeneration units into Alcoa's operations and maintenance system.</p> | <p>Revised Action Plan 1/2008 (Pinjarra) Alinta will continue to work with Alcoa to close out the remaining OEM drawings for Unit 2, which require incorporation into Alcoa's maintenance drawing system.</p> <p>Responsible Person Alinta Energy Asset Engineering Manager</p> <p>Target Date December 2013</p> |
| <p>Issue 6/2008 (Pinjarra) <u>Asset Creation/Acquisition</u> <u>2(e) Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood</u> <i>Status: In progress at the time of the 2013 AMS review</i></p> | |
| <p>Recommendation 6/2008 (Pinjarra) The 2008 review report detailed an action plan for Alinta to establish and maintain a full record and understanding of its legal requirements as an electricity generation and transmission owner.</p> | <p>Revised Action Plan 6/2008 (Pinjarra) Alinta will convert the gap analysis into a scheduled action plan.</p> <p>Responsible Person HSSE Manager</p> <p>Target Date December 2013</p> |
| <p>Issue 7/2008 (Pinjarra) <u>Environmental Analysis</u> <u>4(c) Compliance with statutory and regulatory requirements</u> <i>Status: In progress at the time of the 2013 AMS review</i></p> | |
| <p>Recommendation 7/2008 (Pinjarra) The 2008 review report detailed an action plan for Alinta to investigate, understand and comply with the statutory and regulatory noise level requirements for the Pinjarra cogeneration plant.</p> | <p>Revised Action Plan 7/2008 (Pinjarra) Alinta will install (with Alcoa's assistance) the analyser on unit 2.</p> <p>Responsible Person Alinta Energy Asset Engineering Manager</p> <p>Target Date June 2014</p> |

Appendix B – References

Alinta staff and representatives participating in the review

Alinta Energy

- General Manager Power Generation
- Head of Asset Management
- Finance Manager – Power Generation
- Lead Engineering Planner
- IT Infrastructure and Security Manager
- Manager Regulatory Compliance
- Alinta Wholesale Regulation Manager

Alcoa

- WA Operations CoGen Supervisor
- Principal Mechanical Engineer WAO Powerhouse.

Deloitte staff and representatives participating in the review

| | | Hours |
|----------------------|--------------------------------|--------------|
| • Richard Thomas | Partner | 4 |
| • Andrew Baldwin | Specialist Leader | 18 |
| • David Herbert | Senior Analyst | 40 |
| • Manuela Cervellera | Senior Analyst | 2 |
| • Tanuja Sanders | Engineer (KT & Sai Associates) | 14 |
| • Keith Sanders | Engineer (KT & Sai Associates) | 9 |
| • Kobus Beukes | QA Partner | 1 |

Key documents and other information sources examined

- Asset Management Plan - Pinjarra Power Station 2018
- AMP Spreadsheet FY17
- AMP Spreadsheet FY18
- Alinta Energy Asset Management Framework
- Alinta Energy OHS Management Framework
- Alinta Energy Enterprise Risk Management Policy
- Alinta Energy Enterprise Risk Management Framework
- Project Approval Portal screenshot via SharePoint
- Alcoa ISO14001 Certificate
- Alcoa Environment Health and Safety Directory
- Business Case electronic forms
- Management of Change forms
- Project Commercial Sign-Off form
- 2016 Asset Project Delivery Model Training (Slide Deck)
- Alinta Energy Plant Decommissioning Policy
- Pinjarra Decommissioning Report June 2017 (conducted by Jacobs)
- Pinjarra Compliance Manual
- Ministerial Audit Report 2015 and 2016
- Pinjarra weekly work schedule
- Alinta Energy Maintenance Work Process Manual

- Incident Management Register
- Power Generation Weekly Performance Reports
- Sample Environmental report listing screenshot via SharePoint
- Example Alcoa powerhouse lead team meeting minutes
- Example Alcoa powerhouse operational procedures
- Mitsubishi report “Delaying Comprehensive Rotor Inspection until 3rd Major Inspection” – April 2016
- Alcoa Cogeneration Unit #2 Inspection Outage labour scoping overview
- Alcoa Pinjarra Availability data extract (including outages)
- Combustion tuning report (conducted by MHI)
- Alcoa Cogeneration GT2 Final Outage Report
- Alcoa Powerhouse work order data extract
- Alcoa sample Weekly Business Report – 25 June 2017 (to Alinta)
- Alcoa Application Recovery Plan
- Alcoa Pinjarra Refinery Business Recovery Plan
- Alcoa Disaster Recovery Plan
- Alcoa Computer Centre recovery plan
- Alcoa Pinjarra Emergency Response plan
- Alinta Energy IT policy listing
- Alinta Energy IT Security Policy
- Alinta Energy back-up system protocol
- Sample back up report
- Sample system restoration test
- Application user approval matrix
- Accounts policies/Password Policy system parameters
- Pinjarra Power Station Risk Register
- Pinjarra Power Station Emergency Response Plan
- Alcoa LMS training package references
- Alcoa Powerhouse training report
- Accounting position paper – Operating and Capital Expenses Policy
- Financial Budgeting Model (including Capital budget)
- Pinjarra Fixed Asset Register
- Pinjarra Power Station Financial Model
- Finance Monthly Management Pack – Power Generation.

Appendix C – Post review implementation plan

This plan has been prepared by Alinta Pinjarra and does not form part of Deloitte’s review findings.

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| <p>Issue 1/2017</p> <p><i>Asset planning: 1(a) Asset management plan covers key requirements.</i></p> <p>Although the Alinta Energy Pinjarra Cogeneration Plant – Asset Management Plan FY2018 - FY2022 (AMP) generally reflects Alinta Pinjarra’s expectations and requirements for managing its generation assets, the AMP can be further improved as it does not clearly address the following elements expected by Alinta Energy’s Asset Management Framework:</p> <ul style="list-style-type: none"> • Contingency plans designed to mitigate the business impact of incidents or emergencies arising as a result of realised asset related risks • A brief description of any known and significant risks relating to assets • Consideration and documentation of legal and compliance requirements. | |
| <p>Recommendation 1/2017</p> <p>Alinta Pinjarra update its AMP to explicitly incorporate the following elements of its Asset Management Framework and EGL obligations:</p> <ul style="list-style-type: none"> • Contingency plans • Known and significant risks relating to key assets • Legal and compliance requirements. | <p>Action Plan 1/2017</p> <p>Alinta Pinjarra will update its AMP to explicitly incorporate the following elements of its Asset Management Framework and EGL obligations:</p> <ul style="list-style-type: none"> • Contingency plans • Known and significant risks relating to key assets • Legal and compliance requirements. <p>Responsible Person: Head of Asset Management</p> <p>Target Date: August 2018</p> |
| <p>Issue 2/2017</p> <p><i>Environmental analysis: 4(c) Compliance with statutory and regulatory requirements.</i></p> <p>In response to a finding of the previous (2013) AMS review that Alinta Pinjarra’s site Compliance Manual remained in draft form, Alinta Pinjarra devised an action plan for the Manual to be reviewed and finalised. As the Manual had not been formally reviewed and approved as a final document as at 30 June 2017, the issue and action plan remained outstanding for the purpose of this review.</p> <p>In August 2017, the Compliance Manual was reviewed and updated to reflect the current legal, safety and environmental obligations relating to Alinta Pinjarra’s operations.</p> <p><i>No further action is required.</i></p> | |
| <p>Recommendation 2/2017</p> <p>Not applicable – the necessary corrective action was taken in August 2017.</p> | <p>Action Plan 2/2017</p> <p>Complete – August 2017.</p> |

Issue 3/2017

Asset Operations: 5(a) Operational policies and procedures are documented and linked to service levels required

Asset Maintenance: 6(a) Maintenance policies and procedures are documented and linked to service levels required

In 2014, NEM Energy [heat recovery steam generator (**HRSG**) manufacturer] was commissioned by Alinta Pinjarra to design and implement major modifications to the Plant’s cogeneration units to improve steam production capacity at low GT Loads.

The updated drawings relating to those modifications are not yet fully integrated into the O&M system managed by Alcoa on Alinta Pinjarra’s behalf.

Recommendation 3/2017

Alinta Pinjarra work with Alcoa to ensure updated drawings of the modified HRSG units are fully integrated within the O&M system.

Action Plan 3/2017

Alinta Pinjarra will work with Alcoa to ensure updated drawings of the modified HRSG units are fully integrated within the O&M system.

Responsible Person: Head of Asset Management and Alcoa WA Operations CoGen Supervisor

Target Date: June 2018

Issue 4/2017

Asset Maintenance: 6(e) Risk management is applied to prioritise maintenance tasks

Risk management: 8(a) Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system

Alinta Pinjarra applies the Alinta Energy group-wide risk management framework across its asset management activities. Alcoa also applies a structured, risk based approach to its O&M activities, performed in accordance with the O&M Agreement.

However, Alinta Pinjarra has not yet captured clear evidence of some of those risk management activities to demonstrate that its risk management philosophies and approach are consistently applied.

For example:

- A consistent approach and timeframe has not been designed for preparing and reviewing risk treatment plans and reports, other than through the annual review of the AMP
- The AMP does not provide a clear and consistent reference to specific risk assessment and management activities, including preparation of risk treatment plans (which often result in allocation of capital expenditure) and links to insurer risk reduction recommendations. For example, in relation to Alinta Pinjarra’s decision to extend the Unit 1 critical rotor inspection to be delayed until the 3rd major inspection in 2023, the impact of that decision (e.g. on other maintenance activity and cost forecasts) had not been reflected in Alinta Pinjarra’s records of the risks associated with the Unit 1 gas turbine rotor prior to and subsequent to the decision
- The Pinjarra site risk register does not capture all risk elements identified through the contingency planning process (refer to Issue 5/2017) or the insurer risk reduction recommendations.

In relation to 6(e) *Risk management is applied to prioritise maintenance tasks:*

- In relation to the major inspection of a “U1 Gas Turbine Rotor” initially scheduled for November/December 2017 and classified in the AMP as a medium risk, Alinta Pinjarra engaged MHI to assess whether the major inspection could be delayed. In April 2016, MHI concluded that it was possible for the critical rotor inspection to be delayed until the 3rd major inspection scheduled for 2023, enabling Alinta Pinjarra to make a decision not to purchase a replacement rotor. Although Alinta Pinjarra had demonstrated its assessment of risk in prioritising maintenance tasks, the impact of that decision had not been reflected in Alinta Pinjarra’s records of the risks and related treatments associated with the Unit 1 gas turbine rotor prior to and subsequent to the decision.

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| <p>Recommendation 4/2017</p> <p>Alinta Pinjarra:</p> <ul style="list-style-type: none"> (a) Establish a clear approach and timeframe for assessing risks, implementing treatment plans and monitoring status on a more frequent basis than the annual review of the AMP (b) Further develop its site Risk Register to include all risk elements relevant to its management of the power station assets, including the contingency planning process and insurer risk reduction recommendations. | <p>Action Plan 4/2017</p> <p>Alinta Pinjarra will:</p> <ul style="list-style-type: none"> (a) Establish a clear approach and timeframe for assessing risks, implementing treatment plans and monitoring status on a more frequent basis than the annual review of the AMP (b) Further develop its site Risk Register to include all risk elements relevant to management of the power station assets, including the contingency planning process and insurer risk reduction recommendations. <p>Responsible Person: Head of Asset Management and Alcoa WA Operations CoGen Supervisor</p> <p>Target Date: March 2018</p> |
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| <p>Issue 5/2017</p> <p><i>Contingency Planning: 9(a) Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks</i></p> <p>As Alinta Pinjarra’s contingency plans and arrangements are currently maintained/described in different processes and documents, it has the opportunity to further ensure the completeness and consistency of its contingency planning arrangements by capturing all of its plans and processes in one single reference. Such an approach would be consistent with Alinta Energy’s Asset Management Framework.</p> | |
| <p>Recommendation 5/2017</p> <p>Alinta Pinjarra:</p> <ul style="list-style-type: none"> (a) Establish a formal process for ensuring that contingency arrangements in place for all key risks to the power station’s operations and availability (such as fuel and water supply) are rigorously challenged and tested (b) Prepare a clear overarching “umbrella” document to capture all contingency plans in place for each of the key risks to Alinta Pinjarra’s assets’ operations and availability. | <p>Action Plan 5/2017</p> <p>Alinta Pinjarra will:</p> <ul style="list-style-type: none"> (a) Establish a formal process for ensuring that contingency arrangements in place for all key risks to the power station’s operations and availability (such as fuel and water supply) are rigorously challenged and tested (b) Prepare a clear overarching “umbrella” document to capture all contingency plans in place for each of the key risks to Alinta Pinjarra’s assets’ operations and availability. <p>Responsible Person: Head of Asset Management</p> <p>Target Date: March 2018</p> |

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| <p>Issue 6/2017</p> <p><i>AMS Review: 12(b) Independent reviews (e.g. internal audit) are performed of the asset management system</i></p> <p>Although components of Alinta Pinjarra’s asset management system are subject to regular review and update, Alinta Pinjarra has not applied a formal process for ensuring a sufficient degree of independence in any regular review of the asset management plan and underlying asset management system.</p> |
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| <p>Recommendation 6/2017</p> <p>In accordance with the Alinta Energy Asset Management Framework, Alinta Pinjarra implement:</p> <p>(a) The requirement for its asset management system to be subject to an independent review on a regular basis</p> <p>(b) A register or record to capture the reviews conducted on its asset management system and the independence of the associated reviewer.</p> | <p>Action Plan 6/2017</p> <p>Alinta Pinjarra will implement:</p> <p>(a) The requirement for its AMS to be subject to an independent review on a regular basis</p> <p>(b) A register or record to capture the reviews conducted on its AMS and the independence of the associated reviewer.</p> <p>Responsible Person: Head of Asset Management</p> <p>Target Date: August 2018</p> |
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