WR Carpenter No.1 Pty Ltd

Electricity Generation Licence (EGL20)

2015 Asset Management System Review

July 2015

Deloitte.

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Mr Frank Sine
Authorised Representative
WR Carpenter No 1 Pty Ltd
631 Karel Avenue
Jandakot WA 6164

8 July 2015

Dear Frank

Electricity Generation Licence (EGL20) - 2015 Asset Management System Review report

We have completed the Electricity Generation Licence Asset Management System Review for WR Carpenter No.1 Pty Ltd for the period 9 September 2008 to 31 March 2015 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 me on 08 9365 7024 or Andrew Baldwin on 08 9365 7236.

Yours sincerely

Richard Thomas
Partner
Deloitte Touche Tohmatsu

Contents

1 Independent Reviewer's Report

With the Economic Regulation Authority's approval, Deloitte Touche Tohmatsu (**Deloitte**) was engaged to conduct a limited assurance review of WR Carpenter No. 1 Pty Ltd's (**WR Carpenter**) Electricity Generation Licence (EGL20) (the **Licence**) asset management system.

The review was conducted as a limited assurance engagement in accordance with the specific requirements of the Licence and the April 2014 issue of the *Audit and Review Guidelines: Electricity and Gas Licences* (**Guidelines**).

WR Carpenter's responsibility for maintaining an effective asset management system

WR Carpenter is responsible for establishing and maintaining an effective asset management system (including relevant policies, procedures and controls) for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines.

Our responsibility

Our responsibility is to express a limited assurance conclusion on the effectiveness of WR Carpenter's asset management systems to meet Licence requirements based on our procedures. We conducted our engagement in accordance with Australian Standard on Assurance Engagements (**ASAE**) 3500 *Performance Engagements* issued by the Australian Auditing and Assurance Standards Board and the Guidelines, in order to express a conclusion whether, based on the procedures performed and evidence obtained, anything has come to our attention to indicate that WR Carpenter had not, in all material respects, established and maintained an effective asset management system for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines and in operation for the period 9 September 2008 to 31 March 2015.

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

A limited assurance engagement in accordance with ASAE 3500 involves identifying areas where a material misstatement of the effectiveness of asset management system is likely to arise, addressing the areas identified and considering the process used to prepare the asset management system information. A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

Our procedures were based on professional judgement and 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 Authority and an associated work program
- Interviews with and representations from relevant staff to gain an understanding of the development and maintenance of policy and procedural documentation
- Examination of documented policies and procedures for key functional requirements and consideration of their relevance to WR Carpenter's asset management system requirements and standards
- Physical visit to the MFC Facility located at the Worsley Alumina refinery
- Consideration of reports and references evidencing activity
- Consideration of the installation's function, normal modes of operation and age
- Reporting of findings to WR Carpenter for review and response.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance

obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement. Accordingly, we do not express an opinion providing reasonable assurance about whether the WR Carpenter has, in all material respects, established and maintained an effective asset management system for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines.

Limitations of use

This report is made solely for the information and internal use of WR Carpenter 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 this report will be provided to the Authority for the purpose of reporting on the asset management system review for WR Carpenter's electricity generation licence. We agree that a copy of this report may be provided to the Authority for its information in connection with this purpose but only on the basis that we accept no duty, liability or responsibility to the Authority in relation to the report. We accept no duty, responsibility or liability to any party, other than WR Carpenter, in connection with the report or this engagement.

Inherent limitations

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 asset management system deficiencies, 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.

Independence and quality control

We have complied with the independence and other relevant ethical requirements relating to assurance engagements, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour. The firm applies Auditing Standard ASQC 1 Quality Control for Firms that Perform Audits and Reviews of Financial Reports and Other Financial Information, Other Assurance Engagements and Related Services Engagements, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Conclusion

Based on the procedures performed and evidence obtained in this report, nothing has come to our attention to indicate that WR Carpenter had not, in all material respects, established and maintained an effective asset management system for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines and in operation during the period 9 September 2008 to 31 March 2015.

Table 3 of this report provides effectiveness ratings for each of the 12 key processes in the asset management life-cycle assessed by this engagement. For those aspects of WR Carpenter's asset management system 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 TOUCHE TOHMATSU

Richard Thomas
Partner
Perth, July 2015

2 Executive Summary

2.1 Introduction and background

The Economic Regulation Authority (the **Authority**) has, under the provisions of the *Electricity Industry Act 2004* (the **Act**), issued WR Carpenter No. 1 Pty Ltd (**WR Carpenter**) an Electricity Generation Licence (EGL20) (the **Licence**) to operate a Multi-fuel Cogeneration power station facility (**MFC Facility**) for providing electricity and steam to BHP Billiton (**BHPB**) Worsley Alumina Pty Ltd (**WAPL**) and any excess electricity to the South West Interconnected System (**SWIS**).

Through an Operations & Maintenance Agreement with WR Carpenter, on 8 January 2014 WAPL assumed operational control and responsibility for final construction and commencement of the MFC Facility, including ongoing facility operations and maintenance. As some construction, facility modifications and commissioning activities continued to occur subsequent to 8 January 2014, the MFC Facility had been in partial operations mode.

Section 14 of the Act requires WR Carpenter to provide to the Authority an asset management system review (the **review**) conducted by an independent expert acceptable to the Authority not less than once in every 24 month period (or any longer period that the Authority allows). The Authority set the period to be covered by the review as 9 September 2008 to 31 March 2015. After the review period end, on 19 May 2015, WAPL became part of the listed BHPB demerged entity South32.

At the request of WR Carpenter, Deloitte Touche Tohmatsu (**Deloitte**) has undertaken a limited assurance review of WR Carpenter's asset management system.

The review has been conducted in accordance with the April 2014 issue of the *Audit and Review Guidelines: Electricity and Gas Licences* (**Guidelines**), which sets out 12 key processes in the asset management life-cycle. The limited assurance review was undertaken in order to express a conclusion whether, in all material respects, based on the procedures performed and evidence obtained, anything has come to our attention to indicate that WR Carpenter 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 in operation during the period 9 September 2008 to 31 March 2015.

The objective of this report is to:

(a) Provide a summary of the background to the review and of the procedures performed by us

(b) Communicate our review findings and associated recommendations to you.

Our Independent Reviewer's Report is also contained in section 1 of this report.

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

2.2 Findings

As WR Carpenter's Operations & Maintenance Agreement with WAPL provides for WAPL to assume full operational control and responsibility for the MFC Facility's operations and maintenance, WR Carpenter does not play any role in establishing or maintaining the MFC Facility's asset management functions.

For the purpose of this review, we have assessed the asset management functions and associated control procedures established and maintained by WAPL, as they apply to the MFC Facility.

In considering WAPL's (on behalf of WR Carpenter) 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, WAPL (on behalf of WR Carpenter) had maintained consistent procedures and controls within the MFC Facility's asset management system
- WAPL staff appeared to have a full working understanding of their roles, particularly displaying an understanding of the asset management processes within their area of responsibility.

This review assessed that of the 55 elements of WR Carpenter's asset management system:

- For the asset management process and policy definition adequacy ratings:
  - 37 are rated as "Adequately defined"
  - Two elements are rated as "Requires some improvement"
  - 16 elements are not rated
- For the asset management performance ratings:
  - 36 are rated as "Performing effectively"
  - Two elements are rated as "Opportunity for improvement"
  - 17 elements are not rated.
- There is one opportunity for improvement (addressing two elements) where further action is recommended.

Specific assessments for each criterion are summarised at **Table 3** in section 3 "Summary of findings" 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 WR Carpenter's response to previous recommendations

As this is the first review of WR Carpenter's asset management system, there are no previous review recommendations requiring WR Carpenter's response.

2.4 Recommendations and action plans

<table>
<tr><th>AMS Key Process and Effectiveness Criteria</th><th>Adequacy rating</th><th>Issue 1/2015</th></tr>
<tr><td rowspan="3">12. Review of AMS</td><td>Requires some improvement (B)</td><td rowspan="3">Considering the nature of its business model and its contractual arrangements with WAPL, the asset management system applicable to the MFC Facility and related activities appear to be sufficiently mature, robust and stable, with internal reviews carried out by WAPL management on a regular basis.
However, no independent review has been conducted to assess the effectiveness and performance of that asset management system for the purpose of the MFC Facility's operations.</td></tr>
<tr><td>Performance rating</td></tr>
<tr><td>Opportunity for improvement (2)</td></tr>
<tr><td colspan="2">Recommendation 1/2015
WR Carpenter request WAPL to consider engaging an independent party to conduct a review of the effectiveness and performance of the asset management system applicable to the MFC Facility.</td><td>Action Plan 1/2015
WR Carpenter will request WAPL to consider engaging an independent party to conduct a review of the effectiveness and performance of the asset management system applicable to the MFC Facility.
Responsible Person: Senior Controller Technical & Operations
Target Date: 31 October 2015</td></tr>
</table>

2.5 Scope and objectives

As described in our engagement letter dated 24 July 2014, we have conducted a limited assurance engagement in order to express a conclusion whether, based on the procedures performed and the evidence obtained, anything has come to our attention that causes us to believe that WR Carpenter has not, in all material respects, established and maintained an effective asset management system for

assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines. Our report covers the period 9 September 2008 to 31 March 2015.

Our engagement was conducted in accordance with Australian Standard on Assurance Engagements ASAE 3000 Assurance Engagements Other than Audits or Reviews of Historical Financial Information), issued by the Australian Auditing and Assurance Standards Board and provides limited assurance as defined in ASAE 3000. The procedures we performed were based on our professional judgement and are described in more detail in section 2.6 below.

A limited assurance engagement in accordance with ASAE 3000 involves identifying areas where a material misstatement of the asset management system is likely to arise, addressing the areas identified and considering the process used to prepare the asset management system information. A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement. Accordingly, we do not express an opinion providing reasonable assurance about whether the WR Carpenter has, in all material respects, established and maintained an effective asset management system for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines.

In accordance with the Audit Guidelines, the review considered the effectiveness of WR Carpenter's existing control procedures within the following 12 key processes in the asset management life-cycle:

#	Key processes	Effectiveness criteria
1	Asset planning	(a) Planning processes and objectives reflect the needs of all stakeholders and is integrated with business planning (b) Service levels are defined (c) Non-asset operations (e.g. demand management) are considered (d) Lifecycle costs of owning and operating assets are assessed (e) Funding options are evaluated (f) Costs are justified and cost drivers identified (g) Likelihood and consequences of asset failure are predicted (h) Plans are regularly reviewed and updated.
2	Asset creation and acquisition	(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	(a) Underutilised and underperforming 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.
4	Environmental analysis (all external factors that affect the system)	(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.

#	Key processes	Effectiveness criteria
5	Asset operations	(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 receive training commensurate with their responsibilities.
6	Asset maintenance	(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	(a) Adequate system documentation for users and IT operators (b) Input controls include appropriate verification and validation of data entered into the system (c) Logical security access controls appears adequate, such as passwords (d) Physical security access controls appear adequate (e) Data back-up procedures appear adequate (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	(a) Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system (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	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks
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.

#	Key processes	Effectiveness criteria
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 provide 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 asset management system described therein are kept current (b) Independent reviews (e.g. internal audit) are performed of the asset management system.

Each key process and effectiveness criteria is applicable to WR Carpenter's Licence and as such were individually considered as part of the review.

2.6 Approach

Our approach for this review involved the following activities, which were undertaken during the period March to June 2015:

- Utilising the Guidelines and Reporting Manual 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 for approval by the Authority
- Development of a work program in support of the Review Plan and based on the review priority determined by the risk assessment applicable to each of the effectiveness criteria subject to review
- Correspondence and interviews with WR Carpenter and WAPL staff to gain understanding of process controls in place (see **Appendix A** for staff involved)
- Visited the MFC Facility at WAPL's 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 WR Carpenter's asset management systems (see **Appendix A** for reference listing)
- Consideration of the resourcing applied to maintaining those controls and processes
- Reporting of findings to WR Carpenter for review and response.

2.7 Inherent limitations

Because of the inherent limitations of any procedure, it is possible that fraud or error 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 findings

In accordance with the Audit Guidelines, the assessment of both the process and policy definition 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	• 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	• 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	• 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	• 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	• 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	• 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	• 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	• 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 post review implementation plans (**Section 4**).

Table 3: Asset management system effectiveness summary

						Ratings	
Criteria	Consequence	Likelihood	Inherent Risk	Control Risk	Review Priority	Definition adequacy	Performance
1. Asset planning						**A**	**1**
1(a)	Minor	Probable	Low	Moderate	Priority 5	A	1
1(b)	Minor	Probable	Low	Moderate	Priority 5	A	1
1(c)	Minor	Probable	Low	Moderate	Priority 5	Not rated	Not rated
1(d)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
1(e)	Minor	Probable	Low	Moderate	Priority 5	Not rated	Not rated
1(f)	Moderate	Unlikely	Medium	Moderate	Priority 4	A	1
1(g)	Major	Probable	Medium	Moderate	Priority 4	A	1
1(h)	Minor	Unlikely	Low	Moderate	Priority 5	A	1
2. Asset creation and acquisition						**Not Rated**	**Not Rated**
2(a)	Moderate	Unlikely	Medium	Moderate	Priority 4	Not rated	Not rated
2(b)	Moderate	Probable	Medium	Moderate	Priority 4	Not rated	Not rated
2(c)	Moderate	Unlikely	Medium	Moderate	Priority 4	Not rated	Not rated
2(d)	Moderate	Unlikely	Medium	Moderate	Priority 4	Not rated	Not rated
2(e)	Major	Unlikely	High	Moderate	Priority 2	Not rated	Not rated
3. Asset disposal						**Not Rated**	**Not Rated**
3(a)	Minor	Unlikely	Low	Moderate	Priority 5	Not rated	Not rated
3(b)	Minor	Probable	Low	Moderate	Priority 5	Not rated	Not rated
3(c)	Minor	Probable	Low	Moderate	Priority 5	Not rated	Not rated
3(d)	Moderate	Unlikely	Medium	Moderate	Priority 4	Not rated	Not rated
4. Environmental analysis						**A**	**1**
4(a)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
4(b)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
4(c)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
4(d)	Moderate	Unlikely	Medium	Moderate	Priority 4	A	Not rated
5. Asset operations						**A**	**1**
5(a)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
5(b)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
5(c)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
5(d)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
5(e)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
6. Asset maintenance						**A**	**1**
6(a)	Major	Unlikely	Medium	Moderate	Priority 4	A	1
6(b)	Moderate	Unlikely	Medium	Moderate	Priority 4	A	1
6(c)	Major	Probable	Medium	Moderate	Priority 4	A	1
6(d)	Major	Probable	Medium	Moderate	Priority 4	A	1
6(e)	Major	Probable	Medium	Moderate	Priority 4	A	1
6(f)	Moderate	Unlikely	Medium	Moderate	Priority 4	A	1
7. Asset management information system						**A**	**1**
7(a)	Minor	Probable	Low	Moderate	Priority 5	A	1
7(b)	Minor	Probable	Medium	Moderate	Priority 4	A	1

						Ratings	
Criteria	Consequence	Likelihood	Inherent Risk	Control Risk	Review Priority	Definition adequacy	Performance
7(c)	Minor	Probable	Low	Moderate	Priority 5	A	1
7(d)	Minor	Probable	Low	Moderate	Priority 5	A	1
7(e)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
7(f)	Minor	Probable	Low	Moderate	Priority 5	Not rated	Not rated
7(g)	Minor	Probable	Low	Moderate	Priority 5	A	1
8. Risk management						**A**	**1**
8(a)	Major	Probable	High	Moderate	Priority 2	A	1
8(b)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
8(c)	Moderate	Probable	Medium	Moderate	Priority 4	A	1
9. Contingency planning						**A**	**1**
9(a)	Major	Probable	High	Moderate	Priority 2	A	1
10. Financial planning						**A**	**1**
10(a)	Minor	Unlikely	Medium	Moderate	Priority 4	A	1
10(b)	Minor	Probable	Low	Moderate	Priority 5	A	1
10(c)	Minor	Unlikely	Low	Moderate	Priority 5	A	1
10(d)	Minor	Probable	Low	Moderate	Priority 5	A	1
10(e)	Minor	Unlikely	Medium	Moderate	Priority 4	A	1
10(f)	Moderate	Unlikely	Medium	Moderate	Priority 4	A	1
11. Capital expenditure planning						**Not Rated**	**Not Rated**
11(a)	Moderate	Probable	Medium	Moderate	Priority 4	Not rated	Not rated
11(b)	Minor	Probable	Low	Moderate	Priority 5	Not rated	Not rated
11(c)	Moderate	Probable	Medium	Moderate	Priority 4	Not rated	Not rated
11(d)	Minor	Unlikely	Low	Moderate	Priority 5	Not rated	Not rated
12. Review of AMS						**B**	**2**
12(a)	Moderate	Probable	Low	Moderate	Priority 5	B	2
12(b)	Minor	Probable	Low	Moderate	Priority 5	B	2

4 Detailed findings, recommendations and action plans

The following tables contain:

- **Findings**: the reviewer's understanding of the process and any issues that have been identified during the review
- **Recommendations**: recommendations for improvement or enhancement of the process or control
- **Action plans**: WR Carpenter'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)	Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	WR Carpenter's contractual arrangements with WAPL enable WAPL to operate the MFC Facility in a manner which meets the needs of the WAPL refinery (in accordance with Good Engineering and Operating Practices and OEM Instructions). Through discussions with WAPL staff and consideration of WAPL's whole of refinery business planning processes, we observed that WAPL's business model and resources specifically accommodate the operation and maintenance of the MFC Facility as a critical component of the WAPL refinery's operations.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
1(b)	Service levels are defined	Through discussions with the WAPL A/Manager Production Power; and consideration of the MFC Facility Operating Strategy, we observed that: • As the primary purpose of the MFC Facility is to supply steam and electricity to the WAPL refinery, the facility's availability requirements drive the required service levels • The MFC Facility's required service levels are clearly defined as KPIs in an Organisation Design Protocol, which is displayed in the powerhouse control room.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
1(c)	Non-asset options (e.g. demand management) are considered	As the MFC Facility was established for the primary purpose of supplying steam and electricity to the WAPL refinery, there is no requirement or opportunity for WAPL and WR Carpenter to consider non-asset options.	
		Adequacy Rating: Not rated	**Performance Rating:** Not rated
1(d)	Lifecycle costs of owning and operating assets are assessed	Through discussions with the WAPL A/Manager Production Power; and consideration of the WAPL's Life of Asset Replacement Capital Plan and capital investment policy, MFC Facility Operating Strategy and five year plan, we determined that assessment of lifecycle costs of owning and operating the facility's assets is undertaken through WAPL's financial and capital planning processes, which addresses for each major item of equipment: • Operating and maintenance philosophy • Life cycle plan and critical outages • Performance improvement opportunities.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

No	Effectiveness criteria	Findings	
1(e)	Funding options are evaluated	Owing to the nature of the Capacity Purchase Agreement between WR Carpenter and WAPL, WR Carpenter and WAPL do not currently have need to consider alternative funding arrangements for MFC Facility assets.	
		Adequacy Rating: Not rated	**Performance Rating:** Not rated
1(f)	Costs are justified and cost drivers identified	Through discussions with the WAPL A/Manager Production Power; and consideration of the MFC Facility operating strategy and five year planning process, we observed that the cost drivers associated with each major equipment at the facility are identified and built into the planning process. For example, we observed WAPL's forecasting and justification of costs associated with rectification works undertaken since January 2014.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

1(g)	Likelihood and consequences of asset failure are predicted	Through discussion with the WAPL A/Manager Production Power, A/Superintendent Maintenance Analysis and Improvement and Operations Superintendent MFC Powerhouse; and consideration of the MFC Facility Operating strategy, five year planning process, MFC risk register and WAPL risk procedures, we observed that WAPL has applied the following mechanisms for predicting the likelihood and consequence of asset failure:
		• The MFC risk register considers several major items of equipment and provides specific details of its operation and maintenance strategy and key life cycle issues and remedial plans
		• The MFC Facility assets are monitored on a continuous basis by two specific groups:
		  o Process control improvement group
		  o Maintenance analysis improvement group
		• Condition monitoring techniques are employed on a frequent basis (relating to oil, vibration, thermographic, etc.)
		• Regular preventative maintenance performed by WAPL provides for regular assessment and maintenance of asset performance
		• A high level of priority is accorded to minimising instances of asset failure and the duration of any such failure to ensure the operation of the WAPL refinery is not impacted.
		• During scheduled outages, main components of the Facility's plant are inspected for defects by WAPL or external consultants
		• As the plant is still new and some items are not yet fully commissioned, WAPL follows OEM instructions and recommendations for maintenance until more detailed knowledge can be learnt of probability of asset failure through historic plant operational experience.	

		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

No	Effectiveness criteria	Findings	
1(h)	Plans are regularly reviewed and updated	Through discussions with key WAPL Power Operations staff; and consideration of WAPL's whole-of-site planning and reporting processes, the MFC Facility Operating Strategy and MFC Facility rolling five year plan, we determined that: • Those MFC Facility plans are subject to review on at least an annual basis • The performance of the MFC Facility is monitored and reviewed via weekly and monthly reports • The MFC Facility detailed maintenance program is maintained as a forward-looking document to avoid unplanned outages and subjected to revision in accordance with continuous improvement with a view to maximising availability and aligning outages to WAPL refinery maintenance programs.	
		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: Not rated (NR) / Not rated (NR)

For the period subject to this review, WR Carpenter and WAPL had not undertaken or contemplated any asset creation and acquisition activities beyond the initial creation of the MFC Facility. Accordingly, consideration has not yet been given to an asset creation and acquisition process relevant to the MFC Facility's ongoing operations.

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: Not rated (NR) / Not rated (NR)

The MFC Facility is in the early phase of its life-cycle, with some construction, facility modifications and commissioning activities continuing to occur subsequent to the handover from WR Carpenter to WAPL on 8 January 2014. No plans have been made to dispose of any of the facility's assets and there is a low likelihood of WR Carpenter disposing of the MFC Facility assets in the short-term.

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)

<table>
<tr><th>No</th><th>Effectiveness Criteria</th><th colspan="2">Findings</th></tr>
<tr><td rowspan="2">4(a)</td><td rowspan="2">Opportunities and threats in the system environment are assessed</td><td colspan="2">Through discussion with key WAPL Power Operations staff, and consideration of relevant supporting documentation, we determined that:
The MFC Facility's environmental licence obligations are managed by the WAPL environmental team on a site-wide basis as operator of the MFC Facility. Aspects of the environmental licence that involve the MFC Facility, such as SOx emissions, which are measured by instruments calibrated and maintained by MFC, are addressed appropriately by both parties. The lime injection system installed on the MFC Facility is controlled to maintain SOx emissions within limits
WAPL's Power Operations business unit has well-established processes and procedures for the management of opportunities and threats in the system environment across all power production facilities on-site, including risk management processes, which address all legislative and contractual obligations. Those processes and procedures are applied to the MFC Facility.</td></tr>
<tr><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
<tr><td rowspan="2">4(b)</td><td rowspan="2">Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved</td><td colspan="2">Through discussion with key WAPL Power Operations staff, and consideration of relevant supporting documentation, we observed that:
MFC staff monitor environmental performance and communicate with WAPL's dedicated Environmental Management function in relation to performance standards
WAPL uses the Honeywell historian database to trend all key plant variables, enabling engineers to review daily performance of key plant aspects for any abnormalities and for the status of key equipment, availability of the plant, capacity and fan pressure to be monitored on a frequent basis
WAPL dedicated Environmental Management function is responsible for reporting any breaches of environmental standards, such as SOx emission limits, to the Department of Environment
Environmental performance is included in the MFC Facility's monthly performance reports.</td></tr>
<tr><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
</table>

<table>
<tr><th>No</th><th>Effectiveness Criteria</th><th colspan="2">Findings</th></tr>
<tr><td rowspan="2">4(c)</td><td rowspan="2">Compliance with statutory and regulatory requirements</td><td colspan="2">Through discussion with key WAPL Power Operations staff, and review of relevant supporting documentation, we observed that WAPL operates and monitors its operations in accordance with the following statutory legislation and licences:
Environmental Operating Licence
Monitoring of SOx emissions is undertaken on a continuous basis to enable reporting of any breaches, as described at section 4(b) above and in accordance with environmental licence requirements. Lime injection on the MFC Facility is used to assist with this requirement
Water/waste is discharged into onsite disposal areas around the WAPL refinery site
Greenhouse emissions under the NGER Act
Occupational Health and Safety Act and associated regulations
Pressure vessel inspection requirements
Mines Act and associated regulations.</td></tr>
<tr><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
<tr><td rowspan="2">4(d)</td><td rowspan="2">Achievement of customer service levels</td><td colspan="2">As the inherent purpose of the MFC Facility is to supply steam and electricity to the WAPL refinery, customer service levels relate to the facility's availability and reliability for supplying the required levels of steam and electricity. WAPL maintains full control over the MFC Facility's operations, as part of its power production portfolio, which includes another cogeneration facility (owned by the South West Cogeneration JV (SWCJV)), which is scheduled to be decommissioned in 2016.
As the MFC Facility is not yet fully commissioned and WAPL has planned major shutdowns as part of known rectification work, the facility's achievement of customer service levels cannot yet be fully measured. Achievement of customer service levels will be more clearly visible once the SWCJV facility has been decommissioned and the MFC Facility is running as a baseload power station.</td></tr>
<tr><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Not rated</td></tr>
</table>

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)

<table>
<tr><th>No</th><th>Effectiveness Criteria</th><th colspan="2">Findings</th></tr>
<tr><td>5(a)</td><td>Operational policies and procedures are documented and linked to service levels required</td><td colspan="2">Through discussion with WAPL's A/Manager Production Power and consideration of relevant supporting documentation, we observed that:
WAPL's Power Operations function recognises its responsibility for operating the MFC Facility in accordance with the Facility's Operating Strategy and required reliability and availability service levels
Control and operation of the MFC Facility is dictated by overall refinery operations, to satisfy power and steam requirements of the refinery processes. The MFC Facility meets this demand in conjunction with the two other powerhouses on site and several supplementary steam boilers. The plant is designed such that the MFC Facility acts as baseload generation, while the other units meet the instantaneous demand requirements
WAPL has a comprehensive list of documented procedures in place to cover operational and maintenance tasks, including:
Control room operations, including management of alerts and faults
Start-up activities
Raising of work orders from 1SAP for planned work for action by the rostered maintenance team
Maintenance planning
Daily and weekly maintenance meetings attended by relevant WAPL staff
Safe work instructions and associated safety assessment and permitting requirements
Completion of work orders.
Procedures for new equipment recently installed as part of commissioning are being developed based on OEM documentation.</td></tr>
<tr><td></td><td></td><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
</table>

No	Effectiveness Criteria	Findings	
5(b)	Risk management is applied to prioritise operations tasks	Through discussion with WAPL's A/Manager Production Power and Operations Superintendent MFC Powerhouse; and consideration of relevant supporting documentation, we observed that WAPL's operational processes include: • A designated MFC Facility risk register based on WAPL's business-wide risk management standards, which are in turn based on BHPB's corporate risk management standards • Application of a risk management approach to all maintenance activities, whereby the maintenance tasks addressing higher risk issues are performed first in order, followed by lower priority tasks • Weekly site-wide meetings with representatives from each area, to plan for the succeeding month, 3 month and 2 yearly periods • Weekly meetings used to arrange the MFC Facility maintenance plan for the upcoming fortnight • Meetings at shift changeover to review performance of the outgoing shift and plan for the incoming shift • Use of a site-wide major events calendar to manage maintenance shutdowns across the plant. The production planning team manages this calendar to align shutdowns where possible and to prevent clashes • A designated team to manage breakdowns across the WAPL refinery site, using a prioritisation approach (i.e. the most critical equipment to the overall refinery is addressed first, and so on). Guidance from staff within the area of the breakdown provides support to this team as required.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (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	Through discussion with WAPL's A/Manager Production Power and Operations Superintendent MFC Powerhouse; and consideration of WAPL's information systems, we observed that: • The 1SAP system acts as the Asset Register for each of WAPL's assets • 1SAP and related software such as AMS, holds detailed information for each major plant component, such as financial information, standing data (asset specifications, location etc.), scheduled maintenance tasks, past work orders performed and any relevant conditioning monitoring information.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
5(d)	Operational costs are measured and monitored	Through discussion with WAPL's A/Manager Production Power and A/Operations Coordinator – MFC Powerhouse; and consideration of WAPL's information systems and relevant supporting documentation, we observed that: • Via 1SAP, WAPL tracks operational costs for the MFC Facility on a monthly basis. The costs measured and monitored include salaries and wages, suppliers, materials and WR Carpenter lease payments • Costs are measured against budget, by cost centre (of which the MFC Facility is a designated cost centre) • Individual asset costs are captured in 1SAP via closed purchase orders.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

No	Effectiveness Criteria	Findings	
5(e)	Staff receive training commensurate with their responsibilities	Through discussion with WAPL's A/Manager Production Power and Process Analysis & Improvement Specialist – Training & Document Control; and consideration of relevant supporting documentation, we observed that: • Each work pack contains relevant task lists and safe work instructions to enable the worker to perform the task required • Training for the entire WAPL refinery site is managed through an Excel-based Learning Management System (**LMS**), which tracks training for all staff. The LMS is also used to track and highlight any training deficiencies, and internal or external training arranged as appropriate to address those deficiencies • Training is delivered in units, which are either site-wide or area-specific for the MFC Facility. Training is tenure-based, where in their first 24 months; staff receive core training before receiving tailored training to become a senior operator. Staff also receive control room training and where applicable, higher level and specific supervisor training • Supervisors are trained in mining regulations before being authorised by the refinery manager (mine manager) to act as a supervisor on site.	
		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) / Performing effectively (1)

<table>
<tr><th>No</th><th>Effectiveness Criteria</th><th colspan="2">Findings</th></tr>
<tr><td>6(a)</td><td>Maintenance policies and procedures are documented and linked to service levels required</td><td colspan="2">Through discussion with WAPL's A/Manager Production Power and consideration of relevant supporting documentation, we observed that:
WAPL's Power Operations and Maintenance Analysis & Improvement functions recognise their responsibility for maintaining the MFC Facility in accordance with the Facility's Operating Strategy and in order to meet the WAPL refinery's reliability and availability requirements
Control and operation of the MFC Facility is dictated by overall refinery operations, to satisfy power and steam requirements of the refinery processes
WAPL has a comprehensive list of documented procedures in place to cover maintenance tasks, including:
Raising of work orders from 1SAP for planned work for action by the rostered maintenance team
Maintenance planning
Daily and weekly maintenance meetings attended by relevant WAPL staff
Procedures for the scope and frequency of routine maintenance of new equipment recently installed as part of commissioning are being developed based on OEM documentation, such as vendor manuals
Implements action plans aimed at minimising costs and improving reliability and operating efficiency.</td></tr>
<tr><td></td><td></td><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
<tr><td>6(b)</td><td>Regular inspections are undertaken of asset performance and condition</td><td colspan="2">Through discussion with WAPL's A/Manager Production Power, A/Operations Coordinator – MFC Powerhouse and A/Superintendent Maintenance Analysis and Improvement; and consideration of relevant supporting documentation, we observed that WAPL:
Has full time third party inspection capabilities at the refinery to undertake rolling third party inspections of relevant equipment such as statutory pressure vessels, and any other items WAPL engineering teams consider key components to be monitored
Uses condition-based monitoring processes for several key components (fans, turbines, etc.). Oil samples are taken from the main components of the plant and sent to an external lab for detailed analysis. This analysis highlights any potential issues with equipment, which may require preventive maintenance (such as at a minimum, an oil change). Vibration testing and thermographic imaging techniques are also used to monitor condition of key components of the plant, and are used to guide maintenance requirements as appropriate.</td></tr>
<tr><td></td><td></td><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
</table>

No	Effectiveness Criteria	Findings	
6(c)	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	Through discussion with WAPL's A/Manager Production Power, A/Operations Coordinator – MFC Powerhouse, A/Superintendent Maintenance Analysis & Improvement and Process Analysis & Improvement Specialist – Training & Document Control; and consideration of relevant supporting documentation, we observed that: • 1SAP is used to record all work schedules and work orders for the plant. The schedules and work orders are tracked on a daily basis, and used to guide maintenance of the plant • As part of the agreement between WR Carpenter and WAPL, the plant was handed over to WAPL on 8 January 2014 in a non-commissioned state, with WAPL responsible for bringing the plant up to contractual specifications for formal commissioning. As the existing gas cogeneration plant (owned by SWCJV) servicing WAPL's refinery will remain in operation until 2016, WAPL's goal is to bring the MFC plant up to specification and commissioned prior to the retirement of the SWCJV gas cogeneration plant. As the commissioning of the MFC plant is still a work in progress and the schedule for ultimate completion of commissioning (2016) has not yet been reached, maintenance plans are considered to be on schedule • WAPL is undertaking significant work to ensure the MFC is ready for baseload operation from 2016 onwards. Evidence was sighted of such works being performed on the Facility's mills, valves and refractory • Daily meetings are held refinery wide for supervisors, to discuss production and execution of maintenance work, and determine priorities • Powerhouse staff (MFC and WAPL's main powerhouse) meet on a weekly basis to review and endorse maintenance plan for the upcoming fortnight.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
6(d)	Failures are analysed and operational/maintenance plans adjusted where necessary	Through discussion with WAPL's A/Manager Production Power, A/Operations Coordinator – MFC Powerhouse and A/Superintendent Maintenance Analysis & Improvement; and consideration of relevant supporting documentation, we observed that: • Unplanned outages that result in a loss of production greater than 1000t of alumina require formal investigation to determine the cause. Depending on the nature of the root cause, a more detailed report and investigation may be undertaken including detailed technical reports • As the MFC plant provides essential power and steam to WAPL's refinery, it is one of WAPL's primary interests to ensure the plant is operating correctly and to ensure any failures are investigated, and actions taken appropriately to prevent reoccurrence. For example, when WAPL identified that the coal mills had difficulties processing wet coal last winter, WAPL undertook maintenance overhauls/replacement on the mills to ensure they are operating correctly for this winter.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

No	Effectiveness Criteria	Findings	
6(e)	Risk management is applied to prioritise maintenance tasks	Through discussion with WAPL's A/Manager Production Power, Operations Superintendent MFC Powerhouse, and A/Superintendent Maintenance Analysis & Improvement; and consideration of relevant supporting documentation, we observed that WAPL's maintenance processes include: • Application of a risk management approach to all maintenance activities, whereby the maintenance tasks addressing higher risk issues are performed first in order, followed by lower priority tasks • A designated MFC Facility risk register based on WAPL's business-wide risk management standards, which are in turn based on BHPB's corporate risk management standards • Weekly site-wide meetings with representatives from each area, to plan for the succeeding month, 3 month and 2 yearly periods • Weekly meetings used to arrange the MFC Facility maintenance plan for the upcoming fortnight • Meetings at shift changeover to review performance of the outgoing shift and plan for the incoming shift • Use of a site-wide major events calendar to manage maintenance shutdowns across the plant. The production planning team manages this calendar to align shutdowns where possible and to prevent clashes • A designated team to manage breakdowns across the WAPL refinery site, using a prioritisation approach (i.e. the most critical equipment to the overall refinery is addressed first, and so on). Guidance from staff within the area of the breakdown provides support to this team as required.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
6(f)	Maintenance costs are measured and monitored	Through discussion with WAPL's A/Manager Production Power and A/Operations Coordinator – MFC Powerhouse; and consideration of relevant supporting documentation, we observed that: • WAPL uses 1SAP to track relevant costs for the plant on a monthly basis. The costs measured and monitored include salaries and wages, suppliers and materials • Individual asset costs are captured in 1SAP via closed purchase orders • Costs are measured against budget, by cost centre (of which the MFC Facility is a designated cost centre).	
		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	Through discussions with WAPL staff and consideration of relevant system documentation, we observed that WAPL manages the site using its 1SAP enterprise system that is aligned with BHPB's group level IT standards, policies and procedures. In particular, we observed that: • The technical documentation for 1SAP is maintained and updated in accordance with BHPB's Group Level Document (**GLD**) standards • Minimum performance requirements to support the effective execution of asset related information management activities are referenced in the GLDs • All documents are stored in BHPB's document management system, which has a tracker for document version control • User guides and other supporting documentation are version controlled and kept up to date.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
7(b)	Input controls include appropriate verification and validation of data entered into the system	Through discussion with WAPL staff and consideration of relevant system documentation, we observed that: • Input controls are managed through built-in checks in 1SAP and aligned to BHPB's group level standards • Processes are in place to verify and validate data entered into the IT system, including data reconciliation between old and new systems, checking data transferred between one system to another is accurate, timely and complete and validating data as close as possible to the point of origin, which includes the ability to trace data back to the source document • Profiles are assigned to each employee based on their roles and position. We observed that the input controls as part of the overall IT system are subject to regular testing in accordance with BHPB's GLD and Business Critical Documents (**BCD**) Self-Assessment and Compliance Standard.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

No	Effectiveness Criteria	Findings	
7(c)	Logical security access controls appears adequate, such as passwords	Through discussions with WAPL staff and consideration of relevant supporting documentation, we observed that: • Access and permissions are managed in accordance with BHPB's group level IT standards as contained in the GLDs • User access to information systems and information assets and associated hosting facilities connecting to the Enterprise Network, are granted via a controlled, auditable process that establishes a single point of accountability • End-users are granted the minimum level of access privileges required to perform their job function and to prevent segregation of duties conflicts • Stringent password requirements are maintained to authenticate user access. We noted that operational processes are implemented and monitored for responding to suspected access violations and misuse of user privileges.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
7(d)	Physical security access controls appear adequate	Through discussions with WAPL staff and consideration of relevant supporting documentation, we observed that group level processes and procedures relating to the access of facilities and the physical protection of information assets and systems have been developed and referenced in BHPB's GLDs. Specifically in the context of access to computer server rooms on site, we observed that: • Access swipe cards are used to restrict and record physical access to the computer server rooms. Access is revoked on termination of an employee and the swipe cards are returned • A quarterly review of access logs to the computer rooms is undertaken to identify any unauthorised access • Contractors are required to be accompanied by appropriate IT personnel when entering the computer rooms. We also noted that adequate precautions appear to have been instigated to contain fire and other damaging events in computer rooms on site.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
7(e)	Data backup procedures appear adequate	Through discussions with WAPL staff and consideration of relevant supporting documentation, we observed that procedures for managing data backup and data restore of WAPL servers have been established consistent with BHP's group level standards. In particular, we observed that: • Regular backups are performed in accordance with the defined schedules and media rotation rules • Backup tapes are stored securely and protected from environmental harm and unauthorised access • Access to the backup tapes is limited to a sub-set of IT Operations personnel.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
7(f)	Key computations related to licensee performance reporting are materially accurate	WAPL's asset management information system does not directly provide data used in any computation related to WAPL's or WR Carpenter's performance reporting.	
		Adequacy Rating: Not rated	**Performance Rating:** Not rated

No	Effectiveness Criteria	Findings	
7(g)	Management reports appear adequate for the licensee to monitor licence obligations	Through discussions with WAPL staff and consideration of relevant supporting documentation and management reporting procedures, we determined that site management is undertaken by WAPL staff. We also observed that: • The IT system on-site is capable of generating a substantial variety of reports • Scheduled reports are run on a regular basis including management reports relating to operation of the plant and performance of routine and first line intervention maintenance.	
		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: Adequately defined (A) / Performing effectively (1)

<table>
<tr><th>No</th><th>Effectiveness Criteria</th><th colspan="2">Findings</th></tr>
<tr><td>8(a)</td><td>Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system.</td><td colspan="2" rowspan="2">Criteria 8(a) and (b)
Through discussions with WAPL's A/Manager Production Power and consideration of WAPL's risk management practices, we observed that:
WAPL as directed by BHPB corporate applied a risk-based management approach, which is communicated and applied throughout the operation of the WAPL facility including the MFC Facility
From an operational perspective, WAPL incorporates risk management as a fundamental aspect of its decision making processes to support and enhance its business activities. In particular:
Risk-based policies and procedures have been created and are applied within WAPL
Risks were originally identified when the MFC Facility was handed over and were captured into a designated risk register in accordance with BHPB corporate guidance. We sighted evidence that the risk register was in use and managed in accordance with BHPB requirements
Risk treatment plans are documented and regularly monitored by the Production Operations team
Risk registers are reviewed on an annual basis.
Based on our examination of the risk management processes in place, we determined that WAPL uses a well-established and consistent system for identifying and managing risks, including formal procedural documentation to support such processes.</td></tr>
<tr><td>8(b)</td><td>Risks are documented in a risk register and treatment plans are actioned and monitored</td></tr>
<tr><td></td><td></td><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
<tr><td>8(c)</td><td>The probability and consequences of asset failure are regularly assessed.</td><td colspan="2">Through discussions with WAPL's A/Manager Production Power, and consideration of relevant supporting documentation, we observed that WAPL has applied the following mechanisms for identifying and assessing the consequence and likelihood of power station asset failure:
Regular preventative maintenance performed by WAPL provides for regular assessment and maintenance of asset performance:
Any issues identified during routine assessments are raised in service bulletins that identify certain maintenance required to be performed
Maintenance frequencies and activities are based on OEM recommendations, guided by WAPL experience where relevant
The MFC risk register considers several major items of equipment and provides specific details of its operation and maintenance strategy and key life cycle issues and remedial plans
A detailed forward maintenance program in accordance with OEM guidelines is maintained for the plant and reviewed on a daily basis</td></tr>
</table>

No	Effectiveness Criteria	Findings	
		• Condition monitoring techniques are employed on a frequent basis (oil, vibration, thermographic, etc.) • During scheduled outages, main components of the Facility's plant are inspected for defects by WAPL or external consultants • A high level of priority is accorded to minimising instances of asset failure and the duration of any such failure to ensure the operation of the WAPL refinery is not impacted • As the plant is still new and some items are not yet fully commissioned, WAPL follows OEM instructions and recommendations for maintenance until more detailed knowledge can be learnt of probability of asset failure through historic plant operational experience. The management structures, skills and resources assigned to the asset management processes appear to be appropriate for enabling the regular assessment of the probability and consequences of asset failure.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

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: Adequately defined (A) / Performing effectively (1)

No	Effectiveness Criteria	Findings
9(a)	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.	Through discussion with WAPL's A/Manager Production Power and Operations Superintendent MFC Powerhouse, and examination of WAPL's contingency planning process and activities, we determined that: • The WAPL refinery site as a whole maintains a range of emergency plans, including an emergency response plan and evacuation plan. These site wide plans accommodate the MFC Facility • The WAPL refinery site has 24/7 onsite fire, ambulance, and general emergency management teams • A number of contingency arrangements are in place, inherent within the design of the overall refinery, and through contractual or operating arrangements. In particular we observed: o As WAPL's power production portfolio currently includes the SWCJV gas cogeneration facility, the WAPL site has surplus power and steam generation capacity until the scheduled decommissioning of the SWCJV gas cogeneration facility in 2016. During the period in which the MFC Facility was operating (to 31 March 2015, being the end of the period subject to review), the SWCJV gas cogeneration facility acted as a fulltime contingency to the MFC Facility o Coal: ▪ Coal is primarily sourced from Griffin Coal Mines via rail to the main WAPL stockpile ▪ Coal from the stockpile is then sent via conveyor to the MFC bunkers with around 20h storage ▪ The main WAPL stockpile holds approximately 10 to 12 months' storage ▪ In the event of supply issues, delivery can be arranged via an alternative local supplier (Premier Coal), which has been tested and proven ▪ In the event that all local coal suppliers were to experience sourcing/delivery issues, coal can be sourced internationally. This sourcing capability has been successfully demonstrated and tested at WAPL's main coal power plant facility and could be utilised for the MFC if required. o Diesel ▪ The main diesel storage onsite at WAPL is sufficient capacity for start-up and shutdown of the coal powerhouses on site and to maintain short term plant stability should issues occur to the coal mills or coal supply ▪ In the event of supply issues, there are several alternative local diesel suppliers available o Water ▪ All water for the MFC is sourced from the refinery as steam condensate return, via a dedicated MFC water purification system ▪ Wakeup water is from the onsite freshwater lake and fed into the plant via WAPL's main powerhouse

No	Effectiveness Criteria	Findings	
		▪ Water can be directly pumped between WAPL's main powerhouse and the MFC Facility if required ○ Staff ▪ The majority of administrative staff are fully trained operators and can run the plant if the shift operators cannot reach work ▪ Skeleton staff arrangements can be put into place until the incoming shift arrive, where the existing shift stays working on a rolling roster, using the medical bay as rest quarters ▪ Staff from the WAPL's main powerhouse can be made available to assist at the MFC Facility if required • Formal arrangements are in place for a senior designated field response team WAPL wide, responsible for managing WAPL wide significant risks/emergencies. These arrangements accommodate external events such as train derailments. We sighted evidence of the use of the field response team at the time of the Boddington fires, where strategies were developed to manage the risk of the fire, in case it became a more direct threat to WAPL facilities. The field response team also arranged simulated emergencies from time to time, to test the various contingency and emergency response plans in place at WAPL.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

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	Through discussion with WAPL's A/Manager Production Power and Finance Business Partner; and consideration of WAPL's financial planning mechanisms, we observed that: • The MFC Facility's financial plan takes the form of a designated WAPL Operations and Maintenance Budget, which forms part of the overall WAPL refinery budget and business plan, 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 steam and electricity • The financial plan puts together the financial elements of the plant's operations to reflect its financial viability over the long term.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
10(b)	The financial plan identifies the source of funds for capital expenditure and recurrent costs	Through discussion with WAPL's A/Manager Production Power and Finance Business Partner and consideration of WAPL's financial planning mechanisms, we determined that the MFC Facility Operations and Maintenance Budget: • Is aligned with WAPL's overall business plans • Identifies the source of funds for any capital expenditure and recurrent costs.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
10(c)	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	Through discussion with WAPL's A/Manager Production Power and Finance Business Partner and consideration of WAPL's financial planning mechanisms, we determined that the MFC Facility Operations and Maintenance Budget: • Constitutes a summary of expenses from the supply of steam and electricity under its contractual agreements, which is prepared and updated annually • Provides projections of operating profit and loss financial position attributable to the MFC Facility • Contains up-to-date projections that are sufficient to cover the future costs of operating the plant.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

No	Effectiveness Criteria	Findings	
10(d)	The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period	Through discussions with WAPL's A/Manager Production Power and Finance Business Partner and consideration of WAPL's financial planning mechanisms, we observed that the MFC Facility Operations and Maintenance Budget: • Provides projections of expenditure up to five years ahead • Is prepared on an annual basis and updated for projections of expenditure requirements • Includes a summary of planned project expenditure for the next five years with a brief description of the intended purpose of the project. The concept of income is not applicable to WAPL's management of the MFC Facility. The Capacity Purchase Agreement between WR Carpenter and WAPL recognises that the income relevant to the Facility's operations is apparent in the agreed monthly charge, payable by WAPL to WR Carpenter.	
		Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
10(e)	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	Through discussions with WAPL's A/Manager Production Power and Finance Business Partner and examination of MFC Facility Operations and Maintenance Budget for the period relevant to this review, we determined that the Budget: • Provides a detailed monthly view of operational, maintenance and administration expenses on a rolling five year basis • Includes a summary of current and planned project expenditure over the next five years, with a brief description of each project's purpose.	
		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 WAPL's A/Manager Production Power and Finance Business Partner and examination of WAPL's financial planning mechanisms, we observed that:
		• Actual versus budgeted expenditure is closely monitored by WAPL via 1SAP
		• A variance analysis report is produced on a regular basis to:
		  ○ Assess actual versus budgeted expenditure
		  ○ Identify areas that are over budget or problematic and determine necessary corrective action.	

		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: Not rated (NR) / Not rated (NR)

WAPL's A/Manager Power Production confirmed that due to the nature of the Capacity Purchase Agreement between WR Carpenter and WAPL, other than the capital provisions agreed for rectification works required at the time of handover of the MFC Facility on 8 January 2014, all costs associated with the operations and maintenance of the MFC Facility are and will be treated as operational costs. That is, there is currently no provision for capital items in the MFC Facility Operations and Maintenance Budget.

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: Requires some improvement (B) / Opportunity for improvement (2)

<table>
<tr><th>No</th><th>Effectiveness Criteria</th><th colspan="2">Findings</th></tr>
<tr><td>12(a)</td><td>A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current</td><td colspan="2">Through discussions with WR Carpenter's Senior Controller Technical & Operations and WAPL's A/Manager Production Power; and examination of relevant documents and correspondence, we determined that:
• Details of the asset management system applicable to the MFC Facility were notified to the Authority in August 2014
• WAPL's Manager Production Power oversees all elements of the asset management system applicable to the MFC Facility, with designated WAPL staff responsible for relevant components of that system
• Internal reviews are carried out by WAPL management to assess the currency of aspects of the asset management system, including:
  ○ Quarterly scenario testing
  ○ Review of crisis and emergency management plans
  ○ Internal review of risk registers by:
  ▪ Governance function at a senior management level
  ▪ Analysis and Improvement teams at the business level.
  ○ Annual testing of critical controls
  ○ Regular review of compliance of group level documents to established industry standards.
However, we note that an independent party has not been assigned or engaged to assess the effectiveness and performance of the asset management system applicable to the MFC Facility and other WAPL powerhouse facilities.</td></tr>
<tr><td></td><td></td><td>Adequacy Rating: Requires some improvement (B)</td><td>Performance Rating: Opportunity for improvement (2)</td></tr>
<tr><td>12(b)</td><td>Independent reviews (e.g. internal audit) are performed of the asset management system</td><td colspan="2">As noted at 12(a) above, although the asset management system applicable to the MFC Facility has been subject to internal review and update, an independent party has not been assigned or engaged to assess the effectiveness and performance of the asset management system applicable to the MFC Facility and other WAPL powerhouse facilities.</td></tr>
<tr><td></td><td></td><td>Adequacy Rating: Requires some improvement (B)</td><td>Performance Rating: Opportunity for improvement (2)</td></tr>
<tr><td></td><td>Recommendation 1/2015
WR Carpenter request WAPL to consider engaging an independent party to conduct a review of the effectiveness and performance of the asset management system applicable to the MFC Facility.</td><td colspan="2">Action Plan 1/2015
WR Carpenter will request WAPL to consider engaging an independent party to conduct a review of the effectiveness and performance of the asset management system applicable to the MFC Facility.
Responsible Person: Senior Controller Technical & Operations
Target Date: 31 October 2015</td></tr>
</table>

5 Follow-of previous review action plans

As this is the first review of WR Carpenter's asset management system, there are no previous review recommendations to which WR Carpenter can respond.

Appendix A – References

Key WR Carpenter/ WAPL contacts

WR Carpenter

- Frank Sine – Authorised Representative; Senior Vice President, GE Energy Financial Services
- Chris Hince – Senior Controller Technical & Operations

WAPL

- Manager Production Power
- A/Manager Production Power
- Operations Superintendent MFC Powerhouse
- A/Operations Coordinator – MFC Powerhouse
- A/Superintendent Maintenance Analysis and Improvement
- Finance Business Partner
- Process Analysis & Improvement Engineer – Electrical
- Process Analysis & Improvement Specialist – Training & Document Control.

Deloitte staff participating in the review

Name	Position	Hours
Richard Thomas	Partner	4.5
Andrew Baldwin	Principal	31
Amit Grover	Senior Analyst	32
Bryn Durrans	Engineer	41
Shailesh Tyagi	Principal Engineer	1
Darren Gerber	QA Partner	1

Key documents and other information sources examined

- MFC operating strategy, including budgets to 2018
- MFC budget spreadsheet, including historic data and tracking of forecast to actual
- AMS system, including vibration monitoring results and analysis
- Oil sample results
- Pressure vessel inspection reports
- Outage maintenance plans, including thermographic imagery
- 1SAP system, including asset information, scheduled maintenance tasks, work orders and costing
- MFC Facility risk register
- WAPL (BHPB) risk procedure (including probability/consequence matrix)
- Permit to work register and personal tracker (by area)
- Staff training register
- Production loss reports
- BHPB GLDs relating to Information Management and Security, Backup and Restore Management and Remediation Tracking
- WAPL STA-018 information management - minimum performance requirements
- WAPL DMS Functional Specification
- Notification to the Authority of details of the asset management system.

Appendix B – Post Review Implementation Plan

Issue 1/2015 *Review of AMS function* Considering the nature of its business model and its contractual arrangements with WAPL, the asset management system applicable to the MFC Facility and related activities appear to be sufficiently mature, robust and stable, with internal reviews carried out by WAPL management on a regular basis. However, no independent review has been conducted to assess the effectiveness and performance of that asset management system.	
Recommendation 1/2015 WR Carpenter request WAPL to consider engaging an independent party to conduct a review of the effectiveness and performance of the asset management system applicable to the MFC Facility.	**Action Plan 1/2015** WR Carpenter will request WAPL to consider engaging an independent party to conduct a review of the effectiveness and performance of the asset management system applicable to the MFC Facility. **Responsible Person:** Senior Controller Technical & Operations **Target Date:** 31 October 2015