WR Carpenter No. 1 Pty Ltd

Electricity Generation Licence (EGL20)
2020 Asset Management System Review

Final report

3 December 2020

ASSURANCE ADVISORY GROUP

Level 11, 251 Adelaide Terrace
PERTH WA 6000

3 December 2020

Mr Chris Russell-Gibson
Investment Director – Whitehelm Capital
WR Carpenter No. 1 Pty Limited
Level 13, 95 Pitt Street
SYDNEY NSW 2000

Dear Mr Russell-Gibson

Electricity Generation Licence (EGL20) – 2020 Asset Management System review report

We have completed the Electricity Generation Licence Asset Management System Review for WR Carpenter No 1 Pty Limited for the period 1 April 2015 to 31 March 2020 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 audit procedures.

If you have any questions or wish to discuss anything raised in the report, please contact Andrew Baldwin at abaldwin@assuranceadvisory.com.au or myself at slinden@assuranceadvisory.com.au.

Yours sincerely

Stephen Linden

Director
Assurance Advisory Group Pty Ltd

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1. Independent assurance practitioner's report

Conclusion

We have undertaken a limited assurance engagement on the effectiveness of WR Carpenter No. 1 Pty Ltd's (**WRC**) Asset Management System (**AMS**), relating to its Electricity Generation Licence (EGL20) (the **Licence**) for the period 1 April 2015 to 31 March 2020 (**review period**).

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that WRC has not established and maintained, in all material respects, an effective AMS for assets subject to the Licence, as measured by the effectiveness criteria in the March 2019 issue of the Audit and Review Guidelines: Electricity and Gas Licences (**the Guidelines**) issued by the Economic Regulation Authority (the **ERA**) and that the systems have not operated effectively for the review period.

Basis for conclusion

We conducted our engagement in accordance with Standard on Assurance Engagements ASAE 3500 *Performance Engagements* (**ASAE 3500**) issued by the Auditing and Assurance Standards Board.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

WRC's responsibility for the AMS

WRC is responsible for ensuring that it has:

- Complied in all material respects with the requirements of the Licence as specified by the Review Guidelines
- Established and maintained an effective AMS for assets subject to the Licence, as measured by the effectiveness criteria detailed in the Guidelines.

Assurance practitioner's 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. We applied Auditing Standard ASQC 1 *Quality Control for Firms that Perform Audits and Reviews of Financial Reports and Other Financial Information, and Other Assurance Engagements* in undertaking this assurance engagement.

Our responsibilities

Our responsibility is to express a limited assurance conclusion on WRC's AMS for assets subject to the Licence, based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with ASAE 3500, 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 WRC's AMS for assets subject to the Licence, have not been established and maintained, in all material respects. That standard requires that we plan and perform this engagement to obtain limited assurance about whether the AMS for assets subject to the Licence is materially ineffective.

A limited assurance engagement conducted in accordance with ASAE 3500 involves identifying areas where the AMS for assets subject to a Licence is likely to be materially ineffective, addressing the areas identified and considering the process used to prepare the AMS for assets subject to the Licence. 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.

Procedures performed

The procedures we performed were based on our professional judgement and consisted primarily of:

- Utilising the Review Guidelines as a guide for development of a risk assessment, which involved discussions with key staff and review of documents to perform a preliminary controls assessment
- Development of a Review Plan for approval by the ERA, and an associated work program
- Interviews with and representations from WRC representatives and key operational and administrative staff to gain an understanding of the development and maintenance of policies and procedural type documentation. A full list of staff engaged has been provided at Appendix B
- Examination of documented policies and procedures for key functional requirements and consideration of their relevance to WRC's AMS requirements and standards
- Physical visit to operations located at the Worsley Alumina refinery
- Consideration of reports and references evidencing activity
- Consideration of activities performed by WRC that relate to operation of the assets.

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 a reasonable assurance opinion on the effectiveness of WRC's AMS for assets subject to the Licence.

Inherent Limitations

Because of the inherent limitations of an assurance engagement, together with the inherent limitation of any system of controls it is possible that fraud, error or non-compliance with the requirements of the Guidelines may occur and not be detected.

A limited assurance engagement relating to the period from 1 April 2015 to 31 March 2020 does not provide assurance on whether the effectiveness of WRC's AMS for assets subject to the Licence will continue in the future.

Restricted use

This report has been prepared for use by WRC for the purpose of satisfying its obligation under Section 14 of the Electricity Industry Act 2004. We disclaim any assumption of responsibility for any reliance on this report to any person other than WRC, or for any other purpose other than that for which it was prepared. We understand that a copy of the report will be provided to the ERA for the purpose of reporting on the effectiveness of WRC's AMS. We agree that a copy of this report will be given to the ERA in connection with this purpose, however we accept no responsibility to the ERA or to anyone who is provided with or obtains a copy of our report.

Stephen Linden
Director
Assurance Advisory Group Pty Ltd

3 December 2020

2. Executive Summary

2.1 Introduction and Background

The Economic Regulation Authority (the **ERA**) has under the provisions of the Electricity Industry Act 2004 (the **Act**), issued to WR Carpenter No. 1 Pty Ltd (**WRC**) an Electricity Generation Licence (EGL20) (the **Licence**).

The Licence relates to WRC operating a Multi-fuel Cogeneration power station facility (**MFC Facility**) for the purpose of base load steam production and co-generation of 104 MW electricity to the South32 Worsley Alumina Pty Ltd (**WAPL**) refinery, which is located near Collie approximately 170km south of Perth. Any excess electricity is exported to the South West Interconnected System. The facility is comprised of two multi-fuel boiler/turbine units, which primarily burn coal but are also capable of burning gas and biomass.

Through an Operations & Maintenance Agreement with WRC, 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. In March 2017 there was a change in management service provider for WR Carpenter No. 1 Pty Ltd from GE Capital to Whitehelm Capital.

Section 14 of the Act requires WRC to provide to the ERA an asset management system review (the **review**) report 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, Assurance Advisory Group (**AAG**) has been appointed to conduct the review for the period 1 April 2015 to 31 March 2020 (**review period**).

The review has been conducted in accordance with the ERA's March 2019 issue of the *Audit and Review Guidelines: Electricity and Gas Licences* (**Review Guidelines**), which set out 12 key processes in the asset management life-cycle. The limited assurance review was undertaken in order to state whether, based on the procedures we have performed and the evidence we have obtained, anything has come to our attention to indicate that WRC has not established and maintained, in all material respects, an effective AMS for assets subject to the Licence, and that the systems have not operated effectively for the review period.

2.2 Findings

As WRC's Operations & Maintenance Agreement with WAPL provides for WAPL to assume full operational control and responsibility for the MFC Facility's operations and maintenance, WRC 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 WRC) internal control procedures, structure and environment, compliance arrangements and information systems specifically relevant to those effectiveness criteria subject to review, we observed that:

- Throughout the review period, WAPL (on behalf of WRC) had maintained consistent procedures and controls within the MFC Facility's AMS
- 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.
- There are three opportunities for WAPL to further improve elements of its asset management practices in relation to the MFC Facility.

This review assessed that, of the 58 elements of WRC's AMS:

- For the asset management process and policy definition adequacy ratings:
  - 40 are rated as "Adequately defined"
  - 2 are rated as "Requires some improvement"
  - 16 are not rated.
- For the asset management performance ratings:
  - 40 are rated as "Performing effectively"
  - 2 are rated as "Opportunity for improvement"
  - 16 are not rated.

2.3 WRC's response to previous review recommendations

A. Resolved during current review period - Not applicable.

B. Unresolved at end of current review period

The one recommendation and action plan raised by the 2015 review (1/2015, relating to independent review of the AMS) had not been specifically actioned during the review period. However, a project has since been initiated for new asset management plans to be developed for WAPL's assets (accommodating the MFC Facility assets), which is expected to address this matter by incorporating independent advice. This review makes no further recommendation in relation to this matter.

Refer to section 5 "Status of recommendations addressing asset system deficiencies from the previous review" for further detail.

2.4 Recommendations and action plans

A. Resolved during current review period - Not applicable

B. Unresolved at end of current review period - - Not applicable

2.5 Scope and objectives

The objective of the review was to independently examine the effectiveness and performance of the AMS established for assets subject to WRC's Licence during the review period.

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

Key processes	Effectiveness criteria
1. Asset Planning	1. Asset management plan covers the processes in this table 2. Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning 3. Service levels are defined in the asset management plan 4. Non-asset operations (e.g. demand management) are considered 5. Lifecycle costs of owning and operating assets are assessed 6. Funding options are evaluated 7. Costs are justified and cost drivers identified 8. Likelihood and consequences of asset failure are predicted 9. Asset management plan is regularly reviewed and updated.
2. Asset creation and acquisition	1. Full project evaluations are undertaken for new assets, including comparative assessment of non-asset options 2. Evaluations include all life-cycle costs 3. Projects reflect sound engineering and business decisions 4. Commissioning tests are documented and completed 5. Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood
3. Asset disposal	1. Under-utilised and under-performing assets are identified as part of a regular systematic review process 2. The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken 3. Disposal alternatives are evaluated 4. There is a replacement strategy for assets
4. Environmental analysis	1. Opportunities and threats in the asset management system environment are assessed 2. Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved 3. Compliance with statutory and regulatory requirements 4. Service standard (customer service levels etc) are measured and achieved.

Key processes	Effectiveness criteria
5. Asset operations	1. Operational policies and procedures are documented and linked to service levels required 2. Risk management is applied to prioritise operations tasks 3. Assets are documented in an asset register including asset type, location, material, plans of components, and an assessment of assets' physical/structural condition 4. Accounting data is documented for assets [new criteria] 5. Operational costs are measured and monitored 6. Staff resources are adequate and staff receive training commensurate with their responsibilities
6. Asset maintenance	1. Maintenance policies and procedures are documented and linked to service levels required 2. Regular inspections are undertaken of asset performance and condition 3. Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule 4. Failures are analysed and operational/maintenance plans adjusted where necessary 5. Risk management is applied to prioritise maintenance tasks 6. Maintenance costs are measured and monitored
7. Asset management information systems	1. Adequate system documentation for users and IT operators 2. Input controls include suitable verification and validation of data entered into the system 3. Security access controls appear adequate, such as passwords 4. Physical security access controls appear adequate 5. Data backup procedures appear adequate and backups are tested 6. Computations for licensee performance reporting are accurate 7. Management reports appear adequate for the licensee to monitor licence obligations 8. Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation [new criteria]
8. Risk management	1. Risk management policies and procedures exist and are applied to minimise internal and external risks 2. Risks are documented in a risk register and treatment plans are implemented and monitored 3. Probability and consequences of asset failure are regularly assessed
9. Contingency planning	1. Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks

Key processes	Effectiveness criteria
10. Financial planning	1. The financial plan states the financial objectives and identifies strategies and actions to achieve those 2. The financial plan identifies the source of funds for capital expenditure and recurrent costs 3. The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) 4. The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period 5. The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services 6. Large variances in actual/budget income and expenses are identified and corrective action taken where necessary
11. Capital expenditure planning	1. There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates 2. The capital expenditure plan provides reasons for capital expenditure and timing of expenditure 3. The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan 4. There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented
12. Review of asset management system	1. A review process is in place to ensure the asset management plan and the asset management system described in it remain current 2. Independent reviews (e.g. internal audit) are performed of the asset management system

Each key process and effectiveness criterion is applicable to WRC'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 March to November 2020:

- Utilising the Guidelines, development of a risk assessment, which involved discussions with key staff and review of documents to undertake a preliminary assessment of relevant controls
- Development of a Review Plan (see Appendix A) for approval by the ERA
- Correspondence and interviews with WRC and WAPL/South32 staff to gain an understanding of process controls in place (see Appendix B for staff involved)
- Site visit to the MFC Facility's operations with a focus on understanding the generation assets, their function, normal mode of operation, age and an assessment of the facilities against the AMS review criteria
- Review of documents, processes and controls to assess the overall effectiveness of WRC's AMS (see Appendix B for reference listing)
- Consideration of the resourcing applied to maintaining those controls and processes
- Reporting of findings to WRC for review and response.

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 AMS processes was 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 AMS 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 and recommendations (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

			Ratings	
Ref	Asset management process and effectiveness criteria	Review priority	Definition adequacy	Performance
1. Asset Planning			**A**	**1**
1.1	Asset management plan covers the processes in this table	Priority 4	A	1
1.2	Planning processes and objectives reflect the needs of all stakeholders and is integrated with business planning	Priority 4	A	1
1.3	Service levels are defined in the asset management plan	Priority 4	A	1
1.4	Non-asset operations (e.g. demand management) are considered	Priority 5	Not rated	Not rated
1.5	Lifecycle costs of owning and operating assets are assessed	Priority 5	A	1
1.6	Funding options are evaluated	Priority 5	Not rated	Not rated
1.7	Costs are justified and cost drivers identified	Priority 5	A	1
1.8	Likelihood and consequences of asset failure are predicted	Priority 4	A	1
1.9	Asset management plan is regularly reviewed and updated.	Priority 5	A	1

Ref	Asset management process and effectiveness criteria	Review priority	Ratings: Definition adequacy	Ratings: Performance
2. Asset creation and acquisition			**Not rated**	**Not rated**
2.1	Full project evaluations are undertaken for new assets, including comparative assessment of non-asset options	Priority 4		
2.2	Evaluations include all life-cycle costs	Priority 4		
2.3	Projects reflect sound engineering and business decisions	Priority 4	Not rated	Not rated
2.4	Commissioning tests are documented and completed	Priority 4		
2.5	Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood	Priority 2		
3. Asset disposal			**Not rated**	**Not rated**
3.1	Under-utilised and under-performing assets are identified as part of a regular systematic review process	Priority 4		
3.2	The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	Priority 5	Not rated	Not rated
3.3	Disposal alternatives are evaluated	Priority 5		
3.4	There is a replacement strategy for assets	Priority 4		
4. Environmental analysis			**A**	**1**
4.1	Opportunities and threats in the asset management system environment are assessed	Priority 4	A	1
4.2	Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	Priority 4	A	1
4.3	Compliance with statutory and regulatory requirements	Priority 4	**B**	1
4.4	Service standard (customer service levels etc) are measured and achieved.	Priority 4	A	1
5. Asset operations			**A**	**1**
5.1	Operational policies and procedures are documented and linked to service levels required	Priority 4	A	1
5.2	Risk management is applied to prioritise operations tasks	Priority 4	A	1
5.3	Assets are documented in an asset register including asset type, location, material, plans of components, and an assessment of assets' physical/structural condition	Priority 4	A	1
5.4	Accounting data is documented for assets [new criteria]	Priority 4	A	1
5.5	Operational costs are measured and monitored	Priority 4	A	1
5.6	Staff resources are adequate and staff receive training commensurate with their responsibilities	Priority 4	A	1
6. Asset maintenance			**A**	**1**
6.1	Maintenance policies and procedures are documented and linked to service levels required	Priority 4	A	1
6.2	Regular inspections are undertaken of asset performance and condition	Priority 2	A	1

Ref	Asset management process and effectiveness criteria	Review priority	Ratings	
			Definition adequacy	Performance
6.3	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	Priority 2	A	2
6.4	Failures are analysed and operational/maintenance plans adjusted where necessary	Priority 4	A	1
6.5	Risk management is applied to prioritise maintenance tasks	Priority 4	A	1
6.6	Maintenance costs are measured and monitored	Priority 4	A	1
7. Asset management information systems			**A**	**1**
7.1	Adequate system documentation for users and IT operators	Priority 5	A	1
7.2	Input controls include suitable verification and validation of data entered into the system	Priority 4	A	1
7.3	Security access controls appear adequate, such as passwords	Priority 5	A	1
7.4	Physical security access controls appear adequate	Priority 5	A	1
7.5	Data backup procedures appear adequate and backups are tested	Priority 4	A	1
7.6	Computations for licensee performance reporting are accurate	Priority 5	Not rated	Not rated
7.7	Management reports appear adequate for the licensee to monitor licence obligations	Priority 5	A	1
7.8	Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation [new criteria]	Priority 4	A	1
8. Risk management			**A**	**1**
8.1	Risk management policies and procedures exist and are applied to minimise internal and external risks	Priority 2	A	1
8.2	Risks are documented in a risk register and treatment plans are implemented and monitored	Priority 4	A	1
8.3	Probability and consequences of asset failure are regularly assessed	Priority 2	A	1
9. Contingency planning			**A**	**1**
9.1	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	Priority 2	A	1
10. Financial planning			**A**	**1**
10.1	The financial plan states the financial objectives and identifies strategies and actions to achieve those	Priority 4	A	1
10.2	The financial plan identifies the source of funds for capital expenditure and recurrent costs	Priority 5	A	1
10.3	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	Priority 5	A	1
10.4	The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period	Priority 5	A	1

Ref	Asset management process and effectiveness criteria	Review priority	Ratings	
			Definition adequacy	Performance
10.5	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	Priority 4	A	1
10.6	Large variances in actual/budget income and expenses are identified and corrective action taken where necessary	Priority 4	A	1
11. Capital expenditure planning			**Not rated**	**Not rated**
11.1	There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates	Priority 4	Not rated	Not rated
11.2	The capital expenditure plan provides reasons for capital expenditure and timing of expenditure	Priority 5		
11.3	The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	Priority 4		
11.4	There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented	Priority 5		
12. Review of asset management system			**A**	**1**
12.1	A review process is in place to ensure the asset management plan and the asset management system described in it remain current	Priority 5	A	1
12.2	Independent reviews (e.g. internal audit) are performed of the asset management system	Priority 5	B	2

4. Detailed findings and recommendations

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.

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)

<table>
<tr><th>Effectiveness criteria</th><th colspan="2">Findings</th></tr>
<tr><td rowspan="2">1.1 Asset management plan covers the processes in this table</td><td colspan="2">Throughout the review period, the following reports and plans accommodated WAPL's key refinery assets, including those at the MFC Facility:
WAPL Energy Operating Strategy, which replaces the previous MFC Facility Operating Strategy
Life of Asset Capital Management Plan
Worsley Life of Asset Annual Plan
Port and Energy Life of Asset Replacement Capital Annual Report
Port and Energy Capital plan.
Collectively, these documents make up the MFC Facility's asset management plan. In particular, they:
Provide an overview on the whole life cycle of the MFC Facility, covering those aspects that ensure the achievement of the business objectives for the assets, including safety of personnel and contractors, maximising commercial output and maintenance of acceptable conditions and risk profile
Include the following elements:
Asset overview, including description of operations and assets
Lifecycle overview, including milestones and end of life
Current business objectives
Lifecycle performance, including performance charts, historical performance, forecast performance, forecast cost, major changes to cost forecast and health and safety
Asset performance, including cost performance indicators, condition assessment, operational risk summary
Major works, including significant scheduled maintenance and refurbishment plan and opportunities.</td></tr>
<tr><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
</table>

Effectiveness criteria	Findings	
1.2 Planning processes and objectives reflect the needs of all stakeholders and is integrated with business planning	WRC's contractual arrangements with WAPL enable WAPL to operate the MFC Facility in a manner which meets the needs of the WAPL refinery and in accordance with Good Operating and Maintenance Practice 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 an integral component of the WAPL refinery's operations, with the primary purpose of supplying steam and electricity to the refinery • The MFC Facility's operations are dictated by the daily steam demand of WAPL's refinery • The Major Events Calendar integrates the refinery outage schedule and the MFC Facility outage schedule, including statutory inspections in order to meet the overall business objectives.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
1.3 Service levels are defined in the asset management plan	Through discussions with the Senior Process Engineer, Energy Technical Support, South32 Worsley, and consideration of the WAPL Energy 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)
1.4 Non-asset operations (e.g. demand management) are considered	As the primary purpose of the MFC Facility is to supply steam and electricity to the WAPL refinery (with WAPL's Energy group managing shortfalls or excess electricity through grid demand or feed-in), there is no requirement or opportunity for WAPL and WRC to consider non-asset options.	
	Adequacy Rating: Not rated	**Performance Rating:** Not rated

Effectiveness criteria	Findings	
1.5 Lifecycle costs of owning and operating assets are assessed	Through discussions with the Senior Process Engineer, Energy Technical Support, South32 Worsley; and consideration of WAPL's Life of Asset Replacement Capital Plan and capital investment policy, and Energy Operating Strategy, 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 the following for each major item of equipment: • Operating and maintenance philosophy • Life cycle plan and critical outages • Performance improvement opportunities. We also observed that South32's Investment Acquisition Requisition process for requesting capital funding to improve an asset includes a breakdown of the lifecycle costs of owning and operating the proposed asset as well as an analysis of the payback period.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
1.6 Funding options are evaluated	Owing to the nature of the Capacity Purchase Agreement between WRC and WAPL, the two parties currently do not have a need to consider alternative funding arrangements for MFC Facility assets.	
	Adequacy Rating: Not rated	**Performance Rating:** Not rated
1.7 Costs are justified and cost drivers identified	Through discussions with the Senior Process Engineer, Energy Technical Support, South32 Worsley; and consideration of WAPL's Life of Asset Replacement Capital Plan and Energy Operating Strategy, we determined that: • Operating and maintenance costs are identified and built into WAPL's annual budgeting process and business plans • Cost drivers for capital projects are identified through South32's Investment Acquisition Requisition process.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

Effectiveness criteria	Findings	
1.8 Likelihood and consequences of asset failure are predicted	Through discussions with the Senior Process Engineer, Energy Technical Support, South32 Worsley; and consideration of the WAPL Energy Operating Strategy, 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 Facility risk register considers several major items of equipment and provides specific details of its operation and maintenance strategy and key life cycles issues and remedial plans • The MFC Facility assets are monitored on a continuous basis by WAPL's Process Control Improvement Group and Maintenance & Analysis Improvement Group • Condition monitoring techniques are employed on a frequent basis. E.g. relating to oil, vibration, thermographic • Regular preventative maintenance performed by WAPL provides for regular assessment 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.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
1.9 Asset management plan is regularly reviewed and updated.	Through discussions with the Senior Process Engineer, Energy Technical Support, South32 Worsley; and consideration of WAPL's whole-of-site planning and reporting processes, and the WAPL Energy Operating Strategy, we determined that: • 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. • The key documents which make up the MFC Facility asset management plans are subject to review on at least an annual basis.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

4.2 Asset creation and acquisition

Key process: Asset creation/acquisition is the provision or improvement of assets

Expected outcome: The asset acquisition framework is economic, efficient and cost-effective; it reduces demand for new assets, lowers service costs and improves service delivery

Overall Adequacy/Performance rating: Not rated

Findings: For the period subject to this review, WRC and WAPL had not undertaken or contemplated any material asset creation and acquisition activities beyond the initial creation of the MFC Facility and minor improvement projects. 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: Asset disposal is the consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets

Expected outcome: The asset management framework minimises holdings of surplus and underperforming assets and lowers service costs. The cost-benefits of disposal options are evaluated

Overall Adequacy/Performance rating: Not rated

Findings: The MFC Facility remains in the early phase of its life-cycle. No plans have been made to dispose of any of the facility's assets and there is a low likelihood of WRC disposing of the MFC Facility assets in the short-term.

4.4 Environmental analysis

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

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

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

Effectiveness criteria	Findings	
4.1 Opportunities and threats in the asset management system environment are assessed	Through discussion with the Environmental Supervisor and Senior Process Engineer, Energy Technical Support, South32 Worsley; and review of relevant supporting information, we determined that: • WAPL's dedicated HSE function manages the MFC Facility's environmental licence obligations as part of the WAPL Refinery's site-wide operations. Aspects of the environmental licence that involve the MFC Facility, such as SOx emissions, which are measured by instruments calibrated and maintained by the MFC Facility, are addressed by the WAPL HSE team and MFC Facility staff • The Energy Operations function has maintained the WAPL risk management processes and procedures to assist in managing opportunities and threats in the system environment across the site's power production facilities, including the MFC Facility.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
4.2 Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	Through discussion with the Environmental Supervisor and Senior Process Engineer, Energy Technical Support, South32 Worsley; and review of relevant supporting information, we determined that: • MFC Facility staff monitor environmental performance and communicate with WAPL's HSE team in relation to performance standards • WAPL uses the Honeywell historian database for monitoring and analysing key plant variables, enabling engineering staff to recognise abnormalities and to monitor the status of key equipment, plant availability, capacity and fan pressure • WAPL's HSE function is responsible for reporting any breaches of environmental standards such as SOx emission limits • Environmental performance is included in MFC Facility monthly performance reports.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

Effectiveness criteria	Findings	

4.3 Compliance with statutory and regulatory requirements	Through discussion with the Environmental Supervisor, South32 Worsley; and review of relevant supporting information, we determined that WAPL has designed its processes and practices to operate and monitor its performance in accordance with the following statutory legislation and licences:
	• Environmental Operating Licence. Specific compliance activities include:
	  ▪ Monitoring of SOx emissions is undertaken on a continuous basis to enable reporting of any breaches in accordance with licence requirements. Lime injection is used to assist with this requirement in relation to the MFC Facility
	  ▪ Water and waste is discharged into designated onsite disposal areas
	• Greenhouse emissions under the NGER Act
	• Occupational Health and Safety Act and associated regulations
	• Pressure vessel inspection requirements
	• Mines Act and associated regulations.
	WAPL recorded an instance during the review period where an environmental licence obligation was not met due to human error (e.g. a missed water sample). At the time, those instances had not been tracked to ensure their full resolution, including any corrective action or process improvements. WAPL has proposed implementing the G360 tracking tool (target date of December 2020) to automate tasks, reminders and closeout of items in the Statutory Obligations Register.
	This review makes no further recommendation in relation to this matter.	

	Adequacy Rating: Requires some improvement (B)	**Performance Rating:** Performing effectively (1)
4.4 Service standard (customer service levels etc) are measured and achieved	Since the MFC Facility commenced operating as a baseload power station in 2016 (at the time of the decommissioning of the cogeneration facility owned by the South West Cogeneration JV). As its primary purpose has been 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. 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)

4.5 Asset operations

Key process: Asset operations is the day-to-day running of assets (where the asset is used for its intended purpose)

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

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

<table>
<tr><th>Effectiveness criteria</th><th colspan="2">Findings</th></tr>
<tr><td rowspan="2">5.1 Operational policies and procedures are documented and linked to service levels required</td><td colspan="2">Through discussion with Senior Process Engineer, Energy Technical Support, South32 Worsley; and consideration of relevant supporting documentation, we observed that:
WAPL’s Energy Operations function recognises its responsibility for operating the MFC Facility in accordance with the Energy 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 other powerhouse 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 developed a comprehensive list of documented procedures, based on OEM documentation, 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.</td></tr>
<tr><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
</table>

Effectiveness criteria	Findings	
5.2 Risk management is applied to prioritise operations tasks	Through discussion with the Senior Process Engineer, Energy Technical Support, South32 Worsley 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 South32'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 • 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 breakdowns provides support to this team as required • 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.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
5.3 Assets are documented in an asset register including asset type, location, material, plans of components, and an assessment of assets' physical/structural condition	Through discussion with the Senior Process Engineer, Energy Technical Support, South32 Worsley 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, including the MFC Facility • 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)
5.4 Accounting data is documented for assets	Through discussion with Senior Process Engineer, Energy Technical Support, South32 Worsley; and consideration of WAPL's 1SAP system, we observed that WAPL's asset database captures: • Acquisition and retirement date • Original, historic and current capital cost • Depreciation rates and costs.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

Effectiveness criteria	Findings	
5.5 Operational costs are measured and monitored	Through discussion with WAPL's Senior Process Engineer, Energy Technical Support; 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 purchase orders.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

Effectiveness criteria	Findings	
5.6 Staff resources are adequate and staff receive training commensurate with their responsibilities	Through discussion with WAPL's Senior Process Engineer, Energy Technical Support 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 instruction 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 • WAPL has assigned designated staff resources to the operation of the MFC Facility, with the following key arrangements in place: ▪ Two shifts are rostered to operate the MFC Facility ▪ In the event that shift operators are unavailable to attend work, WAPL has the following capabilities to ensure the Facility continues to operate: ○ Skeleton shift arrangements, involving a rolling roster for the existing shift and using the medical bay as rest quarters ○ The majority of administrative staff are fully trained operators and can run the MFC Facility if shift operators are unavailable ○ Operators from the WAPL main powerhouse can be assigned to assist at the MFC Facility.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

4.6 Asset maintenance

Key process: Asset maintenance is the upkeep of assets

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

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

Effectiveness criteria	Findings	
6.1 Maintenance policies and procedures are documented and linked to service levels required	Through discussion with WAPL's Senior Process Engineer, Energy Technical Support 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 equipment have been developed based on OEM documentation, such as vendor manuals • WAPL implements action plans aimed at minimising costs and improving reliability and operating efficiency.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

Effectiveness criteria	Findings	
6.2 Regular inspections are undertaken of asset performance and condition	Through discussion with WAPL's Senior Process Engineer, Energy Technical Support, Reliability Engineer - MFC Powerhouse and Area Maintenance Analysis and Improvement Superintendent; 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 preventative maintenance ▪ 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.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	Through discussion with WAPL's Senior Process Engineer, Energy Technical Support, Reliability Engineer - MFC Powerhouse, Area Maintenance Analysis and Improvement Superintendent and Process Analysis & Improvement Specialist – Training and 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. Schedules and work orders are tracked on a daily basis, and used to guide maintenance of the plant • Daily meetings are held refinery wide for supervisors, to discuss production and execution of maintenance work, and to determine priorities • Powerhouse staff (MFC and WAPL's main powerhouse) meet on a weekly basis to review and endorse the maintenance plane for the upcoming fortnight. Through our testing of WAPL's management of outstanding work orders, we observed an instance where a Mechanical work order rated as Urgent @ 2 January 2020 remained open in the Current Outstanding Work Order Register during site visit by Auditor on 23 September 2020. The work was completed by the Operations department under a different Work Order Number, which was closed under Operations work orders register. WAPL has an opportunity to improve the communication between its Mechanical and Operations disciplines by developing a process by which the mechanical work order register is linked to the operations work order register and upon completion of work, the relevant work order is closed by whichever department that has undertaken the works. This improvement opportunity has been raised with relevant WAPL staff.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Opportunity for improvement (2)

Effectiveness criteria	Findings	
6.4 Failures are analysed and operational/maintenance plans adjusted where necessary	Through discussion with WAPL's Senior Process Engineer, Energy Technical Support, Reliability Engineer - MFC Powerhouse and Area Maintenance Analysis and Improvement Superintendent; 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, an actions taken appropriately to prevent reoccurrence.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
6.5 Risk management is applied to prioritise maintenance tasks	Through discussion with WAPL's Senior Process Engineer, Energy Technical Support, Reliability Engineer - MFC Powerhouse and Area Maintenance Analysis and Improvement Superintendent; 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 South32's corporate risk management standards • Weekly site-wide meetings with representatives from each area, to plan for the upcoming 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 include a review of the performance of the outgoing shift and planning for the upcoming fortnight • 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)

Effectiveness criteria	Findings	
6.6 Maintenance costs are measured and monitored	Through discussion with WAPL's Senior Process Engineer, Energy Technical Support; 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 and materials relevant to planned and unplanned maintenance activities • 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 purchase orders.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

4.7 Asset management information systems

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

Expected outcome: The asset management information system provides authorised, complete and accurate information for the day-to-day 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)

Effectiveness criteria	Findings	
7.1 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 South32 group level IT standards, policies and procedures. In particular, we observed that: • Technical documentation for 1SAP is maintained and updated in accordance with South32 group level IT standards • All documents are stored in South32's document management system, which has a tracker for document version control • User guides and other supporting documentation are version controlled, kept up to date and accessible by all users.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
7.2 Input controls include suitable 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 input validation checks within 1SAP and the Honeywell system • Processes are in place to verify and validate data entered into WAPL's core systems, including data reconciliations and validation of data as close as possible to the point of origin/source documentation • Profiles are assigned to each employee based on their roles and position.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

Effectiveness criteria	Findings	
7.3 Security access controls appear adequate, such as passwords	Through discussions with WAPL staff and consideration of relevant supporting documentation, we observed that WAPL has established and maintained procedures and controls which enable: • Access and permissions to be managed in accordance with South32's group level IT standards • User access to information systems and information assets and associated hosting facilities connecting to the Enterprise Network to be granted via a controlled, auditable process that establishes a single point of accountability • End-users to be granted the minimum level of access privileges required to perform their job function and to prevent segregation of duties conflicts • Maintenance of suitable password requirements to authenticate user access.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
7.4 Physical security access controls appear adequate	Through discussions with WAPL staff and consideration of relevant supporting documentation, we observed that WAPL has established and maintained South32 group level processes and procedures relating to the access of facilities and the physical protection of information assets and systems. 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 • Quarterly reviews of access logs to the computer rooms are performed to identify any unauthorised access • Contractors are required to be accompanied by appropriate IT personnel when entering the computer rooms.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
7.5 Data backup procedures appear adequate and backups are tested	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 and maintained consistent with South32's group level standards. We observed that those procedures provide for: • Regular backups to be performed in accordance with the defined schedules and media rotation rules • Backup tapes to be stored securely and protected from environmental harm and unauthorised access • Access to the backup tapes to be limited to a sub-set of IT Operations personnel.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

Effectiveness criteria	Findings	
7.6 Computations for licensee performance reporting are accurate	WAPL's asset management information system does not directly provide data used in any computation related to WRC's licensee performance reporting.	
	Adequacy Rating: Not rated	**Performance Rating:** Not rated
7.7 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: • WAPL's information systems available on-site are capable of generating a substantial variety of reports • Throughout the review period, scheduled reports were run on a regular basis including financial, operational and management reports relating to the MFC Facility.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
7.8 Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	Through discussions with WAPL staff and consideration of relevant supporting documentation, we observed that WAPL has established and maintained South32 group level processes and procedures relating to the protection of information assets and systems, including: • Comprehensive user access controls, including user permissions and remote access • Contemporary cyber security processes and procedures.	
	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: The risk management framework effectively manages the risk that the licensee does not maintain effective service standards

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

<table>
<tr><th>Effectiveness criteria</th><th colspan="2">Findings</th></tr>
<tr><td rowspan="2">8.1 Risk management policies and procedures exist and are applied to minimise internal and external risks

8.2 Risks are documented in a risk register and treatment plans are implemented and monitored</td><td colspan="2">8.1 and 8.2
Through discussion with the Senior Process Engineer, Energy Technical Support, Reliability Engineer - MFC Powerhouse and Area Maintenance Analysis and Improvement Superintendent; consideration of WAPL's risk management practices and examination of supporting documentation, we observed that:
WAPL maintains the South32 corporate-wide risk management approach, which is communicated and applied-throughout the operations of the WAPL Refinery, including the MFC Facility
From an operational perspective, WAPL incorporates risk management as a fundamental aspect of its decision making process to support and enhance its business activities. In particular:
Risk-based policies and procedures are applied to WAPL's operational activities, including asset condition assessments
WAPL maintains a Refinery-wide risk register, plus a MFC Facility specific risk register in accordance with the South32 risk management framework
Risk registers are reviewed on at least an annual basis. We observed evidence of reviews performed during the review period, including resulting amendments to asset operating strategies and plans
Risk treatment plans are documented and regularly monitored by the Production Operations team.
Based on our examination of the risk management processes in place, we determined that WAPL uses as well-established and consistent system for identifying and managing risks, including formal supporting procedural documentation.</td></tr>
<tr><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
</table>

Effectiveness criteria	Findings	
8.3 Probability and consequences of asset failure are regularly assessed	Through discussion with the Senior Process Engineer, Energy Technical Support, Reliability Engineer - MFC Powerhouse and Area Maintenance Analysis and Improvement Superintendent; consideration of WAPL's risk management practices and examination of supporting documentation, we observed that WAPL has applied the following mechanism 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, including defects are identified during routine assessments are raised in service bulletins that identify any additional maintenance requirements ▪ Maintenance frequencies and activities are based on OEM recommendations, guided by WAPL experience and analysis where relevant • Condition monitoring techniques are frequently applied to identify defects and to assist in assessing the probity and consequence of failure. We sighted several examples of results and reports on vibration monitoring, pressure vessel inspection and thermographic imaging • The MFC Facility 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 is maintained in accordance with OEM guidelines and is reviewed on a daily basis. The management structures, skills and resources assigned to WAPL's 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 major disruptions to service standards

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

Effectiveness criteria	Findings
9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	Through discussion with the Senior Process Engineer, Energy Technical Support, Shut-down Maintenance Analysis and Improvement Superintendent and Area Maintenance Analysis and Improvement Superintendent; and examination of WAPL's contingency planning mechanisms, we determined that: • WAPL maintains site-wide emergency plans, including an Emergency Response Plan and Evacuation Plan. All site-wide plans accommodate the MFC Facility • The WAPL refinery maintains 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: ▪ Coal: ○ Coal is primarily sourced from the Griffin Coal Mines via rail to the main WAPL stockpile, which holds approximately 6 months' storage ○ The MFC Facility maintains bunkers with storage capacity of approximately 20 hours ○ In the event of a supply constraint, delivery can be arranged via an alternative local supplier (Premier Coal). That arrangement has been tested and proven ○ In the event of constraints relating to all local suppliers, WAPL continues to maintain the capability to source coal from international suppliers. That capability has been tested and proven at WAPL's main coal power plant facility ▪ Diesel ○ The main on-site diesel storage provides sufficient capacity for start-up and shut down of the coal powerhouses on site and to maintain short term plant stability should coal supply be restricted ○ Several alternate diesel suppliers are available to WAPL

Effectiveness criteria	Findings	
9.1 (cont.)	▪ Water: ○ Water for the MFC Facility is sourced from the refinery as a steam condensate return, via a dedicated water purification system ○ Wake-up water is sourced from WAPL's onsite freshwater lake and supplied to the MFC Facility via WAPL's main powerhouse. During the review period, WAPL has implemented mechanisms to minimise the demand on its onsite freshwater lake ○ Water can also be directly pumped between WAPL's main powerhouse and the MFC Facility. ▪ Staff resources: ○ Two shifts are rostered to operate the MFC Facility ○ In the event that shift operators are unavailable to attend work, WAPL has the following capabilities to ensure the Facility continues to operate: • Skeleton shift arrangements, involving a rolling roster for the existing shift and using the medical bay as rest quarters • The majority of administrative staff are fully trained operators and can run the MFC Facility if shift operators are unavailable • Operators from the WAPL main powerhouse can be assigned to assist at the MFC Facility. Formal arrangements are in place for a WAPL-wide Local Emergency Management Committee, including designated senior staff, responsible for managing WAPL-wide significant risks and emergencies. These arrangements accommodate external events such as train derailments, bush fires and incidents at neighbouring facilities. We sighted evidence of: • The Worsley Refinery Local Emergency Management Committee's participation in a major exercise at the MUJA power station. • Simulated emergencies facilitated by the Worsley Alumina Emergency Services team to test WAPL's ability to effectively activate its emergency response crisis management and business continuity plans. • WAPL's COVID response arrangements.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

4.10 Financial planning

Key process: Financial brings together the financial elements of the service delivery to ensure its financial viability over the long term

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

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

Effectiveness criteria	Findings	
10.1 The financial plan states the financial objectives and identifies strategies and actions to achieve those	Through discussion with the Senior Process Engineer, Energy Technical Support; and consideration of WAPL's financial planning mechanisms, we observed that: • The MFC Facility's financial plan takes the form of a designated Operations and Maintenance budget, which: ▪ Forms part of the overall WAPL Refinery budget and business plan, prepared on a rolling five-year basis ▪ Reflects the Facility's 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 Facility's operations to reflect its financial viability over the long term.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
10.2 The financial plan identifies the source of funds for capital expenditure and recurrent costs	Through discussion with the Senior Process Engineer, Energy Technical Support; 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 plan • Identifies the source of funds for all costs associated with the Facility.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
10.3 The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	Through discussion with the Senior Process Engineer, Energy Technical Support; and consideration of WAPL's financial planning mechanisms, we determined that the annual MFC Facility Operations and Maintenance budget: • Contains a summary of expenses from the supply of steam and electricity subject to the Capacity Purchase Agreement between WRC and WAPL • Provides projections of operating profits or losses and the overall financial position of the Facility • Contains up-to-date projections that are sufficient to cover the future costs of operating the Facility, including capital works expenditure.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)

Effectiveness criteria	Findings	
10.4 The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period	Through discussion with the Senior Process Engineer, Energy Technical Support; and consideration of WAPL's financial planning mechanisms, we determined that the annual MFC Facility Operations and Maintenance budget: • Provides projections of expenditure up to five years in advance • Includes a summary of planned project expenditure for that five-year period. The concept of income is not applicable to WAPL's management of the MFC Facility. The Capacity Purchase Agreement between WRC and WAPL recognises that the income relevant to the Facility's operations is apparent in the agreed monthly charge payable by WAPL to WRC.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
10.5 The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	Through discussion with the Senior Process Engineer, Energy Technical Support; and examination of the annual MFC Facility Operations and Maintenance budget, we determined that the Budget: • Provides a detailed monthly view of operational, maintenance, minor capital works and administration expenses on a rolling five-year basis • Includes a summary of current and planned project expenditure for that five-year period.	
	Adequacy Rating: Adequately defined (A)	**Performance Rating:** Performing effectively (1)
10.6 Large variances in actual/budget income and expenses are identified and corrective action taken where necessary	Through discussion with the Senior Process Engineer, Energy Technical Support; and consideration of WAPL's financial planning mechanisms, we determined that: • WAPL closely monitors actual expenditure against budgeted expenditure • A monthly variance analysis report is generated from WAPL's 1SAP system to: ▪ Assess actual v budgeted expenditure ▪ Identify areas that have exceeded budget or otherwise require attention, including 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 for these works 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: The capital expenditure plan provides reliable forward estimates of capital expenditure and asset disposal income. Reasons for the decisions and for the evaluation of alternatives and options are documented

Overall Adequacy/Performance rating: Not rated

Findings: Due to the nature of the Capacity Purchase Agreement between WRC and WAPL, other than for minor capital works undertaken and planned for the MFC Facility (recognised by WAPL as minor capital works projects), during the review period all costs associated with the operations and maintenance of the MFC Facility have been treated as operational costs. That is, minor capital works are captured in the annual MFC Facility Operations and Maintenance Budget, with no separate capital expenditure planning process in place. Accordingly, all process and controls relevant to minor capital works are addressed in the Financial Planning process (refer to 4.10 above).

4.12 Review of asset management system

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

Expected outcome: The asset management system is regularly reviewed and updated

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

<table>
<tr><th>Effectiveness criteria</th><th colspan="2">Findings</th></tr>
<tr><td rowspan="2">12.1 A review process is in place to ensure the asset management plan and the asset management system described in it remain current</td><td colspan="2">Through discussions with the Senior Process Engineer, Energy Technical Support, South32 Worsley; and examination of relevant documentation and correspondence, we determined that:
The AMS applicable to the MFC Facility had not been amended during the review period
The Senior Process Engineer, Energy Technical Support oversees the AMS applicable to the MFC Facility, with designated WAPL staff responsible for relevant components of the system
Internal reviews are performed by WAPL to assess the currency of the AMS, including:
Ongoing review of the Energy Operating Strategy
Review of crisis and emergency management plans
Regular review of compliance of WAPL practices and key documents to relevant industry standards
Internal review of risk registers by the Analysis and Improvement teams
Quarterly scenario testing
Annual testing of critical controls.</td></tr>
<tr><td>Adequacy Rating: Adequately defined (A)</td><td>Performance Rating: Performing effectively (1)</td></tr>
<tr><td rowspan="2">12.2 Independent reviews (e.g. internal audit) are performed of the asset management system</td><td colspan="2">Although the AMS applicable to the MFC Facility (as part of WAPL’s Production Energy operations) has been subject to internal review and update, during the review period, an independent party had not been assigned to assess the effectiveness and performance of the AMS.
Notwithstanding WAPL’s robust internal practices for reviewing and updating its asset management systems, there remains value in obtaining independent advice on the effectiveness and performance of those systems.
We note that as part of its Strategic Asset Management Planning process and alignment with the ISO 55000 Standard, South32 has initiated a project to develop new asset management plans for its criticality A assets, which accommodate MFC Facility assets. The project is to be undertaken over an 18 to 24 month timeframe and will incorporate independent advice and consideration of the effectiveness and performance of existing asset management systems in place. This review makes no further recommendation in relation to this matter.</td></tr>
<tr><td>Adequacy Rating: Requires some improvement (B)</td><td>Performance Rating: Opportunity for improvement (2)</td></tr>
</table>

5. Status of recommendations addressing asset system deficiencies from the previous review

Reference (no./year)	**Process and policy deficiency / Performance deficiency** (Rating / Reference number, Asset management process & effectiveness criterion / Details of deficiency)	Reviewer's recommendation or action planned	Date resolved	**Details of further action required** (including current recommendation **Further action required** (Yes/No/Not Applicable) reference, if applicable)
A. Resolved during current review period				
Not applicable.				
B. Unresolved at end of current review period				
Reference (no./year)	**Process and policy deficiency / Performance deficiency** (Rating / Reference number, Asset management process & effectiveness criterion / Details of deficiency)	Reviewer's recommendation or action planned		**Details of further action required** (including current recommendation **Further action required** (Yes/No/Not Applicable) reference, if applicable)
1/2015	**B2** ***(12.2) Review of AMS*** **-** *The asset management system is regularly reviewed and updated.* 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.	**Action Plan** 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.		No further action required – refer to findings at item 12.2 above: • During the review period, an independent party had not been assigned to assess the effectiveness and performance of the AMS • However, South32 has initiated a project for developing new asset management plans for its criticality A assets, which accommodate the MFC Facility assets. This project is to be undertaken over an 18 to 24 month timeframe and is expected to involve independent advice as part of the consideration of the effectiveness and performance of existing asset management systems in place for the MFC Facility • This review makes no further recommendation in relation to this matter.

Appendix A - Review Plan

ASSURANCE ADVISORY GROUP

WR Carpenter No. 1 Pty Ltd

EGL20 Asset Management System Review

Review Plan

1 April 2020

Table of Contents

Introduction

Overview

The Economic Regulation Authority (the **ERA**) has under the provisions of the Electricity Industry Act 2004 (the **Act**), issued to WR Carpenter No. 1 Pty Ltd (**WRC**) an Electricity Generation Licence (EGL 20) (the **Licence**).

Section 14 of the Act requires WRC to provide to the ERA an asset management system review (the review) report 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, Assurance Advisory Group (**AAG**) has been appointed to conduct the review for the period 1 April 2015 to 31 March 2020 (**review period**).

The Licence relates to WRC operating a Multi-fuel Cogeneration power station facility (MFC Facility) for providing electricity and steam to South32 Worsley Alumina Pty Ltd (WAPL) and any excess electricity to the South West Interconnected System. The review will be conducted in accordance with the ERA's March 2019 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 AAG and WRC and presented to the ERA for approval.

Objective

The objective of the review is to independently examine the effectiveness and performance of the asset management system established for the assets subject to WRC's Licence during the review period.

Scope

In accordance with the Review Guidelines, the review will consider the effectiveness of WRC'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 WRC's Licence and as such will be individually considered in this review.

Table 1 – Asset management system key processes and effectiveness criteria

Key processes	Effectiveness criteria
1. Asset Planning	• Asset management plan covers the processes in this table • Planning processes and objectives reflect the needs of all stakeholders and is integrated with business planning • Service levels are defined in the asset management plan • Non-asset operations (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 • Asset management plan is regularly reviewed and updated.

Key processes	Effectiveness criteria
2. Asset creation and acquisition	• Full project evaluations are undertaken for new assets, including comparative assessment of non-asset options • 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	• 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	• Opportunities and threats in the asset management system environment are assessed • Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved • Compliance with statutory and regulatory requirements • Service standard (customer service levels etc) are measured and achieved.
5. Asset operations	• 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, and an assessment of assets' physical/structural condition • Accounting data is documented for assets [new criteria] • Operational costs are measured and monitored • Staff resources are adequate and staff receive training commensurate with their responsibilities
6. Asset maintenance	• 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 systems	• Adequate system documentation for users and IT operators • Input controls include suitable verification and validation of data entered into the system • Security access controls appear adequate, such as passwords • Physical security access controls appear adequate • Data backup procedures appear adequate and backups are tested • Computations for licensee performance reporting are accurate • Management reports appear adequate for the licensee to monitor licence obligations • Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation [new criteria]
8. Risk management	• Risk management policies and procedures exist and are applied to minimise internal and external risks • Risks are documented in a risk register and treatment plans are implemented and monitored • 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	• The financial plan states the financial objectives and identifies strategies and actions to achieve those • 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 predictions beyond this period • The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services • Large variances in actual/budget income and expenses are identified and corrective action taken where necessary
11. Capital expenditure planning	• There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates • The capital expenditure 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 the capital expenditure plan is regularly updated and implemented
12. Review of asset management system	• A review process is in place to ensure the asset management plan and the asset management system described in it remain current • Independent reviews (e.g. internal audit) are performed of the asset management system

WRC's responsibility for maintaining an effective asset management system

WRC 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 Licence.

AAG's responsibility

Our responsibility is to express a limited assurance conclusion on whether, based on the procedures performed and the evidence obtained, anything has come to our attention that causes us to believe that WRC's AMS for assets subject to its Licence have not been established and maintained, in all material respects, in accordance with the Licence as measured by the effectiveness criteria in the Guidelines for the period from 1 April 2015 to 31 March 2020. The review will be conducted in accordance with Australian Standard on Assurance Engagements ASAE 3500 Performance Engagements (**ASAE 3500**), issued by the Australian Auditing and Assurance Standards Board.

ASAE 3500 requires that we plan and perform the review to obtain limited assurance about whether the AMS for assets subject to the Licence is materially ineffective. A limited assurance engagement conducted in accordance with ASAE 3500 involves identifying areas where the AMS for assets subject to a Licence is likely to be materially ineffective, addressing the areas identified and considering the process used to prepare the AMS for assets subject to the Licence. 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.

Limitations of use

Our report will be produced solely for the information and internal use of WRC 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 our report.

We understand that a copy of our report will be provided to the ERA for the purpose of meeting WRC's reporting requirements of section 14 of the Act. We agree that a copy of our report may be provided to the ERA for its information in connection with this purpose, however we accept no responsibility to the ERA or to anyone who is provided with or obtains a copy of our reports.

This plan is intended solely for the use of WRC for the purpose of its reporting requirements under section 14 of the Act.

Inherent limitations

A review consists primarily of making enquiries, primarily of persons responsible for the management of assets, applying analytical and other review procedures, and examination of evidence for a small number of transactions or events. A review is substantially less in scope than a reasonable assurance "audit" conducted in accordance with ASAEs. Accordingly, we will not express an audit opinion in the asset management system review report.

Independence

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

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 WRC's asset management systems established for the assets subject to WRC's licence. The risk assessment considers changes to WRC's relevant systems and processes and any matters of significance raised by the ERA and/or WRC. 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 WRC not effectively maintaining an asset management system for the assets subject to its licence, in the absence of mitigating controls. The consequence classification descriptions listed at Table 1 of the Reporting Manual, 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 WRC not effectively maintaining an asset management system for the assets subject to its licence (with reference to the defined effectiveness criteria) is assessed using the likelihood rating listed at Table 17 of the Review Guidelines (refer to Appendix 1). 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 18 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 20 of the Audit Guidelines (refer to Appendix 1-3). Once inherent risks and control risks are established, the audit priority can then be determined using the matrix listed at Table 21 of the Audit Guidelines (refer to Table 3 below). Essentially, the higher the level of risk the more substantive testing is required.

Table 3: Assessment of Review Priority

	Preliminary 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.

Table 4: Review Priority Table

Priority rating	Audit requirement
Review Priority 1	• Controls testing and extensive substantive testing of activities and/or transactions • Follow-up and if necessary, re-test matters previously reported.
Review Priority 2	• Controls testing and moderate substantive testing of activities and/or transactions • Follow-up and if necessary, re-test matters previously reported.
Review Priority 3	• Limited controls testing (moderate sample size). Only substantively test transactions if further control weakness found • Follow-up of matters previously reported.
Review Priority 4	• Confirmation of existing controls via observation and walk through testing • Follow-up of matters previously reported.
Review Priority 5	• 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 based on:

- Prior assessments of the state of controls during the 2015 EGL AMS review
- Our understanding of WRC’s assets and internal processes
- Any other factors that may influence the level or strength of controls.
- Consideration of relevant circumstances and activity that trigger specific performance issues.

At this stage, the risk assessment can only be a preliminary assessment based on reading of documentation and interviews by the auditors. It is possible that the ratings and risk assessment comments may be revised as we conduct our work and new evidence comes to light. The risk assessment is attached at Appendix 2.

System analysis / policy and procedure review

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

- Interviewing WRC representatives and 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 WRC'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 report.

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 WRC representatives and key operational and administrative staff
- If possible, physical visit to the facility's site
- Consideration of the facility'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).

Due to the current restrictions imposed by Australia's COVID-19 Pandemic response, it is possible that all review procedures will be performed remotely. If it is not appropriate for an auditor to physically the Worsley site due to those restrictions, alternate methods will be used to view key assets and to otherwise undertake inspections.

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 Table 8 of the Guidelines) and the performance rating (refer to Table 6 below and Table 9 of the Guidelines) for each of the key processes in WRC's asset management system.

Table 5: 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 6: 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.

The review report will also be structured to address all of the minimum contents specified in section 5 of the Review Guidelines.

WRC is responsible for providing a separate post review implementation plan, if required.

Resources and team

Key WRC contacts

The key contacts for this audit are:

- Chris Russell-Gibson Investment Director, Whitehelm Capital
- Martin Gunda Senior Process Engineer, Energy Technical Support, South32 Worsley

Other South32 Worsley contacts

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

AAG Staff

AAG staff who will be involved with this assignment are:

- Andrew Baldwin Executive Director
- Tanuja Sanders Senior Engineer
- Margaret-Mary Gauci Consultant
- Stephen Linden Director

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

Timing

The initial risk assessment phase was completed on 26 March 2020, after which the draft review plan and risk assessment were presented to WRC for comment prior to submission to the ERA for review and approval.

The remainder of the fieldwork phase is scheduled to be performed over the period April to September 2020, enabling draft and final reports to be submitted to the ERA by the due dates of 31 October 2020 and 30 November 2020 respectively. Reasonable efforts will be made to progress the audit fieldwork in April and May 2020, however the precise timing of fieldwork is dependent on the impact of restrictions resulting from Australia's COVID-19 pandemic response. This situation will be monitored on at least a fortnightly basis.

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

- Planning (including risk assessment): 14 hours
- Fieldwork (including system analysis/walkthrough and testing/review): 58 hours
- Reporting: 18 hours.

Appendix 1 - Risk assessment key

1-1 Criteria for classification of consequence of ineffective performance

Source: Modified from Electricity Compliance Reporting Manual July 2018

Classification	Criteria for classification
Major	Classified on the bases that: • The consequences of ineffective performance would cause major damage, loss or disruption to customers; or • The consequences of ineffective performance would endanger or threaten to endanger the safety or health of a person.
Moderate	Classified on the basis that the consequences of ineffective performance affect the efficiency and effectiveness of the licensee's operations or service provision, but do not cause major damage, loss or disruption to customers.
Minor	Classified on the basis that: • The consequences of ineffective performance are relatively minor – i.e. ineffective performance will have minimal effect on the licensee's operations or service provision and do not cause damage, loss or disruption to customers; • Assessment of performance against the obligation is immeasurable; • The matter of ineffective performance is identified by a party other than the licensee; or • The licensee only needs to use its reasonable or best endeavours to demonstrate effective performance, or where the obligation does not otherwise impose a firm obligation on the licensee.

1-2 Likelihood ratings

Source: Review Guidelines: Electricity and Gas Licences March 2019

	Level	Criteria
A	Likely	Ineffective process or performance is expected to occur at least once or twice a year
B	Probable	Ineffective process or performance is expected to occur every three years
C	Unlikely	Ineffective process or performance is expected to occur at least once every 10 years or longer

1-3 Preliminary adequacy ratings for existing controls

Source: Review Guidelines: Electricity and Gas Licences March 2019

Level	Description
Strong	Controls mitigate the identified risks to a suitable level
Moderate	Controls only cover significant risks; improvement required
Weak	Controls are weak or non-existent and do little to mitigate the risks

Appendix 2 - Risk assessment

1. Asset Planning	
Key process	Asset planning strategies focus on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price)
Outcome	Asset planning is integrated into operational or business plans, providing a framework for existing and new assets to be effectively utilised and their service optimised

Ref	Effectiveness criteria	Consequence	Likelihood	Inherent risk rating	Controls assessment	Review priority
1.1	Asset management plan covers the processes in this table	Moderate	Probable	Medium	Moderate	Priority 4
1.2	Planning process and objectives reflect the needs of all stakeholders and are integrated with business planning	Moderate	Unlikely	Medium	Moderate	Priority 4
1.3	Service levels are defined in the asset management plan	Moderate	Unlikely	Medium	Moderate	Priority 4
1.4	Non-asset options (e.g. demand management) are considered	Minor	Unlikely	Low	Moderate	Priority 5
1.5	Lifecycle costs of owning and operating assets are assessed	Minor	Unlikely	Low	Moderate	Priority 5
1.6	Funding options are evaluated	Minor	Unlikely	Low	Moderate	Priority 5
1.7	Costs are justified and cost drivers identified	Minor	Probable	Low	Moderate	Priority 5
1.8	Likelihood and consequences of asset failure are predicted	Moderate	Probable	Medium	Moderate	Priority 4
1.9	Asset management plan is regularly reviewed and updated	Minor	Probable	Low	Moderate	Priority 5

2. Asset creation and acquisition	
Key process	Asset creation/acquisition is the provision or improvement of assets
Outcome	The asset acquisition framework is economic, efficient and cost-effective; it reduces demand for new assets, lowers service costs and improves service delivery

Ref	Effectiveness criteria	Consequence	Likelihood	Inherent risk rating	Controls assessment	Review priority
2.1	Full project evaluations are undertaken for new assets, including comparative assessment of non-asset options	Moderate	Unlikely	Medium	Moderate	Priority 4
2.2	Evaluations include all life-cycle costs	Moderate	Unlikely	Medium	Moderate	Priority 4
2.3	Projects reflect sound engineering and business decisions	Moderate	Unlikely	Medium	Moderate	Priority 4
2.4	Commissioning tests are documented and completed	Moderate	Unlikely	Medium	Moderate	Priority 4
2.5	Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood	Major	Unlikely	High	Moderate	Priority 2

3. Asset disposal	
Key process	Asset disposal is the consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets
Outcome	The asset management framework minimises holdings of surplus and underperforming assets and lowers service costs. The cost-benefits of disposal options are evaluated

Ref	Effectiveness criteria	Consequence	Likelihood	Inherent risk rating	Controls assessment	Review priority
3.1	Under-utilised and under-performing assets are identified as part of a regular systematic review process	Moderate	Probable	Medium	Moderate	Priority 4
3.2	The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	Minor	Unlikely	Low	Moderate	Priority 5
3.3	Disposal alternatives are evaluated	Minor	Unlikely	Low	Moderate	Priority 5
3.4	There is a replacement strategy for assets	Moderate	Probable	Medium	Moderate	Priority 4

4. Environmental analysis	
Key process	Environmental analysis examines the asset management system environment and assesses all external factors affecting the asset management system
Outcome	The asset management system regularly assesses external opportunities and threats and identifies corrective action to maintain performance requirements

Ref	Effectiveness criteria	Consequence	Likelihood	Inherent risk rating	Controls assessment	Review priority
4.1	Opportunities and threats in the asset management system environment are assessed	Moderate	Probable	Medium	Strong	Priority 4
4.2	Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	Moderate	Probable	Medium	Moderate	Priority 4
4.3	Compliance with statutory and regulatory requirements	Moderate	Probable	Medium	Moderate	Priority 4
4.4	Service standard (customer service levels etc) are measured and achieved.	Moderate	Unlikely	Medium	Strong	Priority 4

5. Asset operations	
Key process	Asset operations is the day-today running of assets (where the asset is used for its intended purpose)
Outcome	The asset operation plans adequately document the processes and knowledge of staff in the operation of assets so service levels can be consistently achieved

Ref	Effectiveness criteria	Consequence	Likelihood	Inherent risk rating	Controls assessment	Review priority
5.1	Operational policies and procedures are documented and linked to service levels required	Moderate	Probable	Medium	Moderate	Priority 4
5.2	Risk management is applied to prioritise operations tasks	Moderate	Probable	Medium	Moderate	Priority 4
5.3	Assets are documented in an asset register including asset type, location, material, plans of components, and an assessment of assets' physical/structural condition	Moderate	Probable	Medium	Moderate	Priority 4
5.4	Accounting data is documented for assets	Moderate	Probable	Medium	Moderate	Priority 4
5.5	Operational costs are measured and monitored	Moderate	Probable	Medium	Moderate	Priority 4
5.6	Staff resources are adequate and staff receive training commensurate with their responsibilities	Moderate	Probable	Medium	Moderate	Priority 4

6. Asset maintenance						
Key process	Asset maintenance is the upkeep of assets					
Outcome	The asset maintenance plans cover the scheduling and resourcing of the maintenance tasks so work can be done on time and on cost					
Ref	**Effectiveness criteria**	**Consequence**	**Likelihood**	**Inherent risk rating**	**Controls assessment**	**Review priority**
6.1	Maintenance policies and procedures are documented and linked to service levels required	Moderate	Probable	Medium	Moderate	Priority 4
6.2	Regular inspections are undertaken of asset performance and condition	Major	Probable	High	Moderate	Priority 2
6.3	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	Major	Probable	High	Moderate	Priority 2
6.4	Failures are analysed and operational/maintenance plans adjusted where necessary	Moderate	Probable	Medium	Moderate	Priority 4
6.5	Risk management is applied to prioritise maintenance tasks	Moderate	Probable	Medium	Moderate	Priority 4
6.6	Maintenance costs are measured and monitored	Moderate	Probable	Medium	Moderate	Priority 4

7. Asset management information systems	
Key process	An asset management information system is a combination of processes, data and software supporting the asset management functions
Outcome	The asset management information system provides authorised, complete and accurate information for the day-to-day 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

Ref	Effectiveness criteria	Consequence	Likelihood	Inherent risk rating	Controls assessment	Review priority
7.1	Adequate system documentation for users and IT operators	Minor	Unlikely	Low	Strong	Priority 5
7.2	Input controls include suitable verification and validation of data entered into the system	Moderate	Probable	Medium	Moderate	Priority 4
7.3	Security access controls appear adequate, such as passwords	Minor	Unlikely	Low	Strong	Priority 5
7.4	Physical security access controls appear adequate	Minor	Unlikely	Low	Strong	Priority 5
7.5	Data backup procedures appear adequate and backups are tested	Moderate	Probable	Medium	Moderate	Priority 4
7.6	Computations for licensee performance reporting are accurate	Minor	Probable	Low	Moderate	Priority 5
7.7	Management reports appear adequate for the licensee to monitor licence obligations	Minor	Probable	Low	Moderate	Priority 5
7.8	Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	Moderate	Unlikely	Medium	Strong	Priority 4

8. Risk management						
Key process	Risk management involves the identification of risks and their management within an acceptable level of risk					
Outcome	The risk management framework effectively manages the risk that the licensee does not maintain effective service standards					
Ref	**Effectiveness criteria**	**Consequence**	**Likelihood**	**Inherent risk rating**	**Controls assessment**	**Review priority**
8.1	Risk management policies and procedures exist and are applied to minimise internal and external risks	Major	Probable	High	Moderate	Priority 2
8.2	Risks are documented in a risk register and treatment plans are implemented and monitored	Moderate	Probable	Medium	Moderate	Priority 4
8.3	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 major disruptions to service standards.					
Ref	**Effectiveness criteria**	**Consequence**	**Likelihood**	**Inherent risk rating**	**Controls assessment**	**Review priority**
9.1	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	Major	Probable	High	Strong	Priority 2

10. Financial planning						
Key process	Financial brings together the financial elements of the service delivery to ensure its financial viability over the long term					
Outcome	The financial plan is reliable and provides for the long-term financial viability of the services					
Ref	**Effectiveness criteria**	**Consequence**	**Likelihood**	**Inherent risk rating**	**Controls assessment**	**Review priority**
10.1	The financial plan states the financial objectives and identifies strategies and actions to achieve those	Moderate	Probable	Medium	Moderate	Priority 4
10.2	The financial plan identifies the source of funds for capital expenditure and recurrent costs	Minor	Probable	Low	Moderate	Priority 5
10.3	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	Minor	Probable	Low	Moderate	Priority 5
10.4	The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period	Minor	Probable	Low	Moderate	Priority 5
10.5	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	Moderate	Probable	Medium	Moderate	Priority 4
10.6	Large 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 for these works 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	The capital expenditure plan provides reliable forward estimates of capital expenditure and asset disposal income. Reasons for the decisions and for the evaluation of alternatives and options are documented

Ref	Effectiveness criteria	Consequence	Likelihood	Inherent risk rating	Controls assessment	Review priority
11.1	There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates	Moderate	Probable	Medium	Moderate	Priority 4
11.2	The capital expenditure plan provides reasons for capital expenditure and timing of expenditure	Minor	Probable	Low	Moderate	Priority 5
11.3	The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	Moderate	Probable	Medium	Moderate	Priority 4
11.4	There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented	Minor	Probable	Low	Moderate	Priority 5

12. Review of asset management system	
Key process	The asset management system is regularly reviewed and updated
Outcome	The asset management system is regularly reviewed and updated

Ref	Effectiveness criteria	Consequence	Likelihood	Inherent risk rating	Controls assessment	Review priority
12.1	A review process is in place to ensure the asset management plan and the asset management system described in it remain current	Minor	Probable	Low	Moderate	Priority 5
12.2	Independent reviews (e.g. internal audit) are performed of the asset management system	Minor	Probable	Low	Moderate	Priority 5

Appendix 3 - Previous review recommendation

The following recommendation was made by the 2015 review:

<table>
<tr><td colspan="2">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.</td></tr>
<tr><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>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>

Appendix B - References

Key WRC /WAPL contacts

WRC

- Investment Director, Whitehelm Capital

WAPL

- Senior Process Engineer, Energy Technical Support
- Superintendent – Energy Production
- Reliability Engineer - MFC Powerhouse
- Area Maintenance Analysis and Improvement Superintendent
- Shutdown Maintenance Analysis and Improvement Superintendent
- Analyst Finance Business Partnership
- Process Analysis & Improvement Engineer – Electrical
- Process Analysis & Improvement Specialist – Training & Document Control.

AAG staff participating in the review

Name	Position	Hours
Andrew Baldwin	Executive Director	58.5
Tanuja Sanders	Senior Engineer	32
Margaret-Mary Gauci	Consultant	4
Stephen Linden	Director, QA Review	1

Key documents and other information sources examined

- Production Energy Operating Strategy, including budget forecasts
- 1SAP system records, including asset information, scheduled maintenance tasks, work orders and costing
- Critical Summary Watchlist reports
- Regulatory Obligations Register
- Boiler NOx exceedance reports
- Environmental Licences
- Email correspondence re MFC unit environmental management matters
- Operating procedures, including Control Room Operations, Shutdown and Start-up Activities, Equipment Operation, Raising and Completing Work Orders, Monitoring and Rescheduling of Work Orders
- Weekly and monthly operations team meetings minutes
- Shift handover reports
- MFC budget spreadsheet, including historic data and tracking of forecast to actual

- Oil analysis reports (certificates)
- Oil Sample results
- Vibration Monitoring results
- Pressure vessel inspection reports
- Thermographic imaging results
- Boiler RATA monitoring report
- List of MFC Planned Major Shutdowns
- Shutdown Technical report
- MFC Generator Condition report
- MFC Alliance Quarterly reports
- Outage maintenance plans
- Forward maintenance schedules
- Work order management reports and communications
- Outstanding work orders report
- DSR Registers
- MFC Facility risk registers
- WAPL risk procedure (including probability/consequence matrix)
- Permit to work register and personal tracker (by area)
- Staff training register
- LMS training competencies matrix
- Production loss reports
- South32 standards and guidelines relating to Technology Security, System and Information Integrity, Physical and Environmental Security, Security Monitoring, Access Control and Data Protection
- WAPL Information Architecture
- Worsley Critical Assessment data – Energy
- South32 Template Asset Management Plan under development
- Emergency simulation/exercise plans, communications and results.