



McGill Engineering Services Pty Ltd

Engineering, Adjudication & Arbitration Services ABN 45 106 691 169

**SOUTH WEST COGENERATION JOINT
VENTURE**

GENERATION LICENCE EGL 9

**ASSET MANAGEMENT SYSTEM
REVIEW**

Prepared By Kevan McGill
Date 8 October 2010



McGill Engineering Services Pty Ltd

Engineering, Adjudication & Arbitration Services ABN 45 106 691 169

Andy Wearmouth
Facilities Manager
South West Cogeneration Joint Venture
15 William Street
Perth WA 6000

Dear Mr Wearmouth

Asset Management System Review Electricity Licences

The fieldwork on the asset management system review of Generation Licence EGL 9, for the review period (1 July 2008 to 30 June 2010) is complete and I am pleased to submit the report to you. The report reflects my findings and opinions.

The Licensee is an entity established by the owners to operate and maintain the plant and accordingly the full scope of asset management is not able to be carried out by the Licensee.

In my opinion, the Licensee maintained, in all material aspects, effective control procedures in relation to the Generation Licence (EGL 9) for the review period and in my opinion, for the functions that it is able to carry out, the Licensee maintained an effective asset management system in relation to the Generation licence (EGL 9) for the review period on the relevant clauses referred to within the objectives section of this report.

Yours sincerely

Kevan McGill
Director

Date 8 October 2010

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Executive Summary

This asset management review was conducted in accordance with the guidelines issued by the Economic Regulation Authority (*Authority*) for the review period (1 July 2008 to 30 June 2010).

The Licensee's plant is on the BHP Billiton Worsley Alumina (WAPL) refinery which requires electricity and steam for the refining process. The Licensee provides steam and a quantity of electricity to the plant process and surplus electricity to the WEM for the balance of the plant output. Small quantities of electricity are drawn from the power system when the plant is shut down or for start up purposes. It has 116 MW of combined cycle gas turbine generation plant. The plant has a heat recovery steam generator fed by gas turbine exhaust gas and capable of supplementary gas firing to increase the steam capacity. The steam is used in the alumina refinery and not for additional generation as would be the case for a combined cycle machine. The first period of the contract for steam and electricity with Worsley Alumina expires at the end of 2015 and advice of advice on exercising the second 10 year option is due by end 2012.

The Licensee is an entity established by the owning joint venture partners to operate and maintain the plant and accordingly the full scope of asset management is not able to be carried out by the Licensee. These include Asset Planning, Asset Creation, and Asset Disposal and to the extent constrained by the functions it can carry out, Asset Review. The Licensee's business model and resources are those consistent with operating and maintaining gas turbine generation plant in accordance with its contractual obligations and does not have the capacity to undertake strategic asset management functions. The Licensee cannot require the owning partners to carry out these strategic functions and if the owning partners do, at their discretion, carry out these functions they may or may not involve the Licensee.

An asset management plan has been developed for the facility to articulate how the asset (power station) will be managed to meet short term operational requirements whilst maintaining the long term performance and integrity of the assets by:

- Setting policies and targets for operating & maintaining the assets.
- Giving maintenance & operations personnel and contract administrators' broad guidelines as to how the assets should be operated, maintained & managed.
- Stating the maintenance regime and outage criteria and setting policies for major plant overhauls and maintenance schedules.
- Identifying critical issues, risks and threats to the business.
- Providing future requirements for the assets; it is a forward-looking document

OVERALL CONCLUSION

The Licensee is an entity established by the joint venture partners to operate and maintain the plant and accordingly the full scope of asset management is not able to be carried out by the Licensee. The Licensee's business model and resources are those consistent with operating and maintaining gas turbine generation plant and does not have the capacity to undertake strategic asset management functions. The Licensee cannot require the joint venture partners to carry out these strategic functions and if the owning partners do, at their discretion, carry out these functions they may or may not involve the Licensee.

In my opinion, the Licensee maintained, in all material aspects, effective control procedures in relation to the Generation Licence (EGL 9) for the review period.

In my opinion, for the functions that it is able to carry out, the Licensee maintained an effective asset management system in relation to the Generation licence (EGL 9) for the review period on the relevant clauses referred to within the objectives section of this report (Page 8).

ASSET MANAGEMENT SYSTEM REVIEW

A summary of the findings of the asset management system review is:

RATINGS

The reviewer's assessment of both the process and policy definition rating and the performance rating for each key process in the Licensee's asset management system is assessed using the scales described below.

Asset management process and policy definition adequacy ratings

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

Asset management review effectiveness rating scale

Rating	Description	Criteria
1	Performing effectively	<ul style="list-style-type: none"> • The performance of the process meets or exceeds the required levels of performance. • Process effectiveness is regularly assessed and corrective action taken where necessary.
2	Opportunity for improvement	<ul style="list-style-type: none"> • The performance of the process requires some improvement to meet the required level. • Process effectiveness reviews are not performed regularly

South West Cogeneration Joint Venture Generation Licence – Asset Management Review

		<p>enough.</p> <ul style="list-style-type: none">• Process improvement opportunities are not actioned.
3	Corrective action required	<ul style="list-style-type: none">• The performance of the process requires significant improvement to meet the required level.• Process effectiveness reviews are performed irregularly, or not at all.• Process improvement opportunities are not actioned.
4	Serious action required	<ul style="list-style-type: none">• Process is not performed, or the performance is so poor that the process is considered to be ineffective.

The overall effectiveness rating for asset management process is based on a combination of the process and policy adequacy rating and the performance rating.

The summary table used to report effectiveness in asset management review reports is shown below.

Asset management effectiveness summary

ASSET MANAGEMENT SYSTEM	Asset management process and policy definition adequacy rating	Asset management performance rating
Asset planning	Not Rated	Not Rated
Asset creation/ acquisition	Not Rated	Not Rated
Asset disposal	Not Rated	Not Rated
Environmental analysis	B	2
Asset operations	A	1
Asset maintenance	A	2
Asset Management Information System	A	1
Risk Management	B	2
Contingency planning	B	2
Financial planning	A	1
Capital expenditure planning	A	1
Review of AMS	Not Rated	Not Rated

It is not implied that any assessment at “A” or “1” means that there is not scope for continuous improvement, rather that no recommendations for improvement have been recommended in this report.

ASSET MANAGEMENT SYSTEM REVIEW

ASSET MANAGEMENT SYSTEM REVIEW OBJECTIVES

Under the *Electricity Industry Act 2004* (the Act) section 14, a generation Licensee must develop and maintain an asset management system to manage the significant asset base for ongoing service delivery to its customers. The Act requires a review of the asset management system every two years (or other time approved by the *Authority*).

This report is an impartial review of the Licensee's asset management effectiveness under the ERA guidelines.

The review conducted between August and September 2010 examined the asset management processes used by the Licensee in delivering the services to its customers. These services include lifecycle processes for:

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

As well as the processes, the asset management supporting systems were tested as to their use and effectiveness. Data used by the Licensee was also examined with respect to its effectiveness for asset management and the delivery of outcomes.

Tests were undertaken through interviews and investigation of the processes to assess whether they were being performed as documented.

The Licensee appointed McGill Engineering Services Pty Ltd to conduct the review of its Generation Licence with approval from the Authority. A preliminary assessment was conducted with the Licensee's management to determine the inherent risk and the state of control for each compliance element of the Licence obligation. McGill Engineering Services Pty Ltd then prioritised the audit coverage based on the risk profile of the Licensee with an emphasis on providing greater focus and depth of testing for areas of higher risk to provide reasonable assurance that the Licensee had complied with the standards, outputs and outcomes under the Licence obligations.

The audit was conducted in a manner consistent with Australian Auditing Standards (AUS) 808 “Planning Performance Audits” and AUS 806 “Performance Auditing”. McGill Engineering Services Pty Ltd evaluated the adequacy and effectiveness of the controls and performance by the Licensee relative to the standards referred in the Generation Licence through a combination of enquiries, examination of documents and detailed testing for Electricity Generation Licence EGL 9 for the Licensee.

REVIEW (AUDIT) PERIOD

The review (audit) period is 1 July 2008 to 30 June 2010.

SCOPE LIMITATION

The review was undertaken by examination of documents, interviews with key persons and observations and is not a detailed inspection of physical items.

Assessment of accuracy of computations is limited to inspection of spreadsheets and the like with an overview of the calculations and random inspection of formulae. Because of the nature of this type of inspection no conclusion can be made that all calculations are correct nor can assurance that data entry errors have not occurred be drawn. The form and nature of financial statements have been examined but no detailed examination of the calculations therein.

ACTIONS FROM PREVIOUS REVIEWS

The actions taken in response to recommendations in previous review to follow up were:

AMS item	Recommendation	Responsible	When	Action Taken
				Further actions required
AMS review	The licensee considers a process of scheduled periodic reviews of the AMS.	Andy Wearmouth	June 2009	Complete. There are regular performance reviews and reviews by the joint venturers of the functions within the joint venture agreement. Reviews of the strategic aspects of an AMS are not within the capacity of the Licensee.
				No further action required:

The report to the Licensee and the *Authority* clearly expresses the opinion of the reviewer in respect of the findings of the review.

The key contacts were:

- Licensee

- Andy Wearmouth, Facilities Manager SWCJV (and Manager Engineering Services, Verve Energy); Gail Godenzi Operations Coordination Worsley Alumina, Tony Mills Maintenance Superintendent Worsley Alumina, Steve Thomas Powerhouse Shutdown Coordinator Worsley Alumina, Tony Minards, BHP Billiton Worsley Alumina, Lead Engineer Power House for Operations.
- McGill Engineering Services Pty Ltd
 - Kevan McGill, John McLoughlin

The audit was conducted during August and September 2010. Kevan McGill took 90 hours and John McLoughlin 10 hours on the review.

Stage	Auditor	Standard
1. Risk & Materiality Assessment Outcome - Operational/ Performance Audit Plan	K McGill	ASA 300 Planning ASA 315: Risk Assessments and Internal Controls AUS 808: Planning Performance Audits AS/NZS 4360:2004: Risk Management ERA Guidelines
2. System Analysis	K McGill	AUS 810: Special Purpose Reports on Effectiveness of Control Procedures
3. Fieldwork Assessment and testing of; <ul style="list-style-type: none">• The control environment• Information system• Compliance procedures• Compliance attitude	K McGill John McLoughlin	AUS 502: Audit Evidence AUS 806: Performance Auditing
4. Reporting	K McGill	ASA 300 Planning AUS 806: Performance Auditing

STATEMENT OF INDEPENDENCE

To the best of my knowledge and belief, there is no basis for contraventions of any professional code of conduct in respect of the audit.

I have not done or contemplate undertaking any other work with the Licensee.

There are no independence threats due to:

- self-interest – as the audit company or a member of the audit team have no financial or non-financial interests in the Licensee or a related entity;
- self-review – no circumstance has occurred where:

- the audit company or a member of the audit team has undertaken other non-audit work for the Licensee that is being evaluated in relation to the audit/review; or
- when a member of the audit team was previously an officer or director of the Licensee; or
- where a member of the audit team was previously an employee of the Licensee who was in a position to exert direct influence over material that will be subject to audit during an audit/review.

There is no risk of a self-review threat as:

- no work has been
 - undertaken by the auditor, or a member of the audit/review team, for the Licensee within the previous 24 months; or
 - the auditor is currently undertaking for the Licensee; or
 - the auditor has submitted an offer, or intends to submit an offer, to undertake for the Licensee within the next 6 months; and
- familiarity – there is no close family relationship with a Licensee, its directors, officers or employees,
- and is not nor is perceived to be too sympathetic to the Licensee’s interests.

RECOMMENDATIONS

The conclusions of each of the elements of the licence are summarised in the following table.

Asset Maintenance	Process/Policy rating	Effectiveness rating
	A	2
<i>6. Asset maintenance</i>		
Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.		
Recommendation		
Reports on action taken on generator windings and turning gear be available for the next review. (Non mandatory recommendation Audit guidelines 11.4).		

Risk management	Process/Policy rating	Effectiveness rating
	B	2
<i>8. Risk management</i>		
Risk management involves the identification of risks and their management within an acceptable level of risk.		

Recommendation

A risk register should be developed along with appropriate responses. (Non mandatory recommendation Audit guidelines 11.4).

Contingency planning	Process/Policy rating	Effectiveness rating
	B	2
<i>9. Contingency planning</i>		
Contingency plans document the steps to deal with the unexpected failure of an asset.		
Recommendation		
Consideration is given to developing contingency plans arising from risk register and other identified risks (Non mandatory recommendation Audit guidelines 11.4).		

REVIEW EVIDENCE

The following evidence was considered.

- Generation Licence
- Asset management plan
- Monthly plant activity report
- Fuel Nozzle inspection reports /site reports
- Generator condition report
- Technical information letter from GE Energy
- Financial statements
- Licence fee invoices, journal entries
- Outage reports
- Availability/ downtime reports
- ERA annual returns

ASSET MANAGEMENT SYSTEM REVIEW RESULTS AND
RECOMMENDATIONS

Asset Planning	Process/Policy rating Not Rated	Effectiveness rating Not Rated					
<p>1. <i>Asset planning</i></p> <p>Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).</p>							
<p>Observations</p>							
<p><i>Asset Planning Process/Plan and its currency</i></p> <p>The Licensee is an entity established by the owning joint venture partners to operate and maintain the plant and accordingly the full scope of asset management is not able to be carried out by the Licensee. The Licensee’s business model and resources are those consistent with operating and maintaining gas turbine generation plant in accordance with its contractual obligations and does not have the capacity to undertake strategic asset management functions. The Licensee cannot require the owning partners to carry out these strategic functions and if the owning partners do, at their discretion, carry out these functions they may or may not involve the Licensee.</p> <p>An asset management plan has been developed for the facility to articulate how the asset (power station) will be managed to meet short term operational requirements whilst maintaining the long term performance and integrity of the assets by:</p> <ul style="list-style-type: none"> • Setting policies and targets for operating & maintaining the assets. • Giving maintenance & operations personnel and contract administrators’ broad guidelines as to how the assets should be operated, maintained & managed. • Stating the maintenance regime and outage criteria and setting policies for major plant overhauls and maintenance schedules. • Identifying critical issues, risks and threats to the business. • Providing future requirements for the assets; it is a forward-looking document <p><i>Allocation of responsibilities / statutory obligations</i></p> <p>The joint venture agreement allocates responsibilities and compliance obligations.</p>							
<p>Asset management process and policy definition</p>							
Process	<input type="checkbox"/>	Policy	<input type="checkbox"/>				
<p>Evidence: Interviewed Andy Wearmouth and listed staff on site. Inspected site. Documents: Include Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.</p>							
<p>Asset management performance</p>							
Process	<input type="checkbox"/>	Documentation	<input type="checkbox"/>	Availability	<input type="checkbox"/>	Use	<input type="checkbox"/>

Issues
<p>The Licensee has an agreement with the owners to carry out the operation and maintenance of the plant to defined service levels such as 95% availability. The Licensee conducts the shorter timeframe asset management elements via contracts, (operations, maintenance) and longer term issue for the licensed assets such as the environment and whole of life of the plant issues. Other than a strategic overview, the elements of an asset management process exist.</p> <p>The Licensee does not carry out the long term and strategic elements of an asset management system as it is not within their capacity to undertake this work. The longer term broad options for the plant are already defined in contractual documentation with both steam and electricity off takers. Whilst these matters have been reviewed by the joint venturers within the review period, there are no identified actions to be taken by the Licensee at this time.</p>
Recommendation
None - as the Licensee will never have the capacity to undertake the strategic roles.

Asset Creation	Process/Policy rating Not Rated	Effectiveness rating Not Rated					
<i>2 Asset creation and acquisition</i>							
Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.							
Observations							
Asset management process and policy definition							
Process	<input type="checkbox"/>	Policy	<input type="checkbox"/>				
Evidence: Interviewed Andy Wearmouth and listed staff on site. Inspected site. Documents: Include Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.							
Asset management performance							
Process	<input type="checkbox"/>	Documentation	<input type="checkbox"/>	Availability	<input type="checkbox"/>	Use	<input type="checkbox"/>
Issues							
The joint venture bodies carry out the long term and strategic elements of an asset management system. The Licensee does not carry out these functions. There has been no asset creation activity in the review period.							
Recommendation							
None - as the Licensee will never have the capacity to undertake the asset creation roles.							

Asset Disposal	Process/Policy rating Not Rated	Effectiveness rating Not Rated					
<p><i>3. Asset disposal</i></p> <p>Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms.</p>							
<p>Observations</p>							
<p><i>Policies and procedures for asset disposal / sample disposal activities</i></p> <p>There is no disposal action in the audit period to form an opinion about effectiveness. There are disposal processes in the various contract documents.</p> <p>There are very significant issues that can arise for disposal before the assets can be safely removed, sites remediated and/or passed to new owners.</p> <p>Removing the generation plant is unlikely during the life of the WAPL plant. The contract extends to 2015 with an option for an additional 10 years, so short term disposal is unlikely. The contract provides for the option of being an IPP (independent Power Producer) independent of the refinery.</p> <p><i>Meeting statutory obligations</i></p> <p>There are documented obligations of the Licensee's sub contractors to comply with statutory obligations. Note the Licensee has no employees.</p>							
<p>Asset management process and policy definition</p>							
Process	<input type="checkbox"/>	Policy	<input type="checkbox"/>				
<p>Evidence: Interviewed Andy Wearmouth and listed staff on site. Inspected site. Documents: Include Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.</p>							
<p>Asset management performance</p>							
Process	<input checked="" type="checkbox"/>	Documentation	<input type="checkbox"/>	Availability	<input type="checkbox"/>	Use	<input type="checkbox"/>
<p>Issues</p>							
<p>The Licensee does not carry out carry out the long term and strategic elements of an asset management system. There has been no asset disposal activity in the review period.</p>							
<p>Recommendation</p>							
<p>None - as the Licensee will never have the capacity to undertake the asset disposal roles.</p>							

Environmental analysis	Process/Policy rating B	Effectiveness rating 2		
<p><i>4. Environmental analysis</i></p> <p>Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.</p>				
<p>Observations</p>				
<p>There are no unresolved issues have arisen with respect to environmental matters. Issues about air and water quality are being managed actively. The host (Worsley) conducts audits of their environmental licence obligations and these licensed assets are embedded in their environmental licence area. No non compliances have been reported.</p> <p>The licensee considers threats to the operation, the principal external threats to the assets being the availability of fuel. Major breakdowns are an internal issue covered under contingencies.</p> <p><i>Standards / monitoring / reporting / breaches</i></p> <p>The input of the external environment (principally the option for operation of the agreements past 2015) to asset planning is carried out by the Licensee for this plant but not strategic environmental issues. The decisions will be made by the joint venture partners and not the Licensee.</p> <p><i>Evaluation Criteria summary</i></p> <ul style="list-style-type: none"> • Opportunities and threats in the system environment are assessed Response: Opportunities/threats for this plant are part of the joint venture arrangement. The Licensee cannot carry out the external functions as the Licensee's business model and resources are those consistent with operating and maintaining gas turbine generation plant and they do not have the capacity to undertake external environmental functions outside those affecting this plant. The joint venture partners will need to explore options if the stage 2 (2015) of the power / steam procurement are not exercised. • Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved Response: The local AMS meets this criterion with service standards defined and measured. The availability criterion has been maintained even with the major outage in the last audit period. • Compliance with statutory and regulatory requirements Response: The AMS meets this criterion and the Licensee's policy documents require compliance with statutory and regulatory obligations. There have been no environmental breaches. The Worsley Alumina licence covers environmental matters. • Achievement of customer service levels Response: Service standards, principally availability have been met. 				
<p>Asset management process and policy definition</p>				
Process	<input checked="" type="checkbox"/>	Policy	<input checked="" type="checkbox"/>	
<p>Evidence: Interviewed Andy Wearmouth and listed staff on site. Inspected site. Documents: Include Asset Management plan, Generator condition report, Outage</p>				

reports, inspection reports, Financial statements.							
Asset management performance							
Process	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	Availability	<input checked="" type="checkbox"/>	Use	<input checked="" type="checkbox"/>
Issues							
<p>There are no material environmental breaches reported.</p> <p>The alumina plant can operate with reduced capacity on coal when gas is short (with the corresponding reduction in steam requirements and the related electricity requirements).</p> <p>Worsley has two gas or oil fired package boilers (each rated 100 T/hr) that are used to offset any loss of steam from the SWCJV.</p> <p>The SWCJV purchases its fuel from Verve so the gas is part of the greater Verve portfolio. The SWCJV is a DBNGP T1 tranche shipper for all of its required transport capacity. This gas transport contract is assigned to Verve by the licensee for ease of day to day DBNGP pipeline management.</p> <p>The plant receives preferential supply from within Verve Energy gas portfolio under partial curtailment scenarios.</p> <p>In an extreme gas shortage there will be no gas to run the alumina refinery calcination process resulting in reduced throughput, Under these conditions, curtailment of the licensed plant ceases to be critical for the steam host.</p>							
Recommendation							
None							

Asset operations	Process/Policy rating A	Effectiveness rating 1
<p><i>5. Asset operations</i></p> <p>Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.</p>		
<p>Observations</p>		
<p><i>Policies and procedures for asset operation / sample activities</i></p> <p>The plant operates in full load mode (is rarely operated at substantially less than full load whereas base load may be turned down at system low load periods). Full load mode is a low thermal cycling mode with reduced stresses. The demands of the alumina process dictate continuous generation with Verve taking any excess and alternatively providing support when the plant requires maintenance. The plant has operated with very high availability (>98%). The plant is highly automated.</p> <p>Worsley Alumina operates the plant for the licensee as part of their electricity and steam generation requirements on site. The operating procedures are well documented. Operation is appropriate for the duty.</p> <p><i>Training/ resources / exceptions</i></p> <p>The contracts operation of the plant to Worsley Alumina. The resourcing is appropriate and ongoing training is evident as are the operating procedures and practices.</p> <p><i>Evaluation Criteria summary</i></p> <ul style="list-style-type: none"> • Operational policies and procedures are documented and linked to service levels required Response: The local AMS meets this criterion with service standards defined. Operational procedures are documented. The plant is operated in accordance with the manufacturers requirements. • Risk management is applied to prioritise operations tasks Response: The local AMS meets this criterion with operations (maintenance predominantly) based on risk assessment. • Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural condition and accounting data Response: Asset registers are contained with the appropriate information in the Worsley Alumina SAP IT system. Worsley Alumina is the day to day operators. • Operational costs are measured and monitored Response: Operational costs – equipment, fuel, staffing, contracts and materials are measured and monitored. • Staff receive training commensurate with their responsibilities Response: Staff receives training commensurate with their responsibilities. Worsley staff has been through a training package. • Performance measures such as unplanned outages Response: Outage log including forced outages has been sighted. 		

Asset management process and policy definition							
Process	<input checked="" type="checkbox"/>	Policy	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>		
<p>Evidence: Interviewed Andy Wearmouth and listed staff on site. Inspected site. Documents: Include Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.</p>							
Asset management performance							
Process	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	Availability	<input checked="" type="checkbox"/>	Use	<input checked="" type="checkbox"/>
Issues							
<p>The plant had a major breakdown in 2008 which involved significant damage from the turbine onwards toward the generator. The cause was a manufacturer's systemic blade failure. Neither the Licensee nor operator caused the fault.</p>							
Recommendation							
None							

Asset Maintenance	Process/Policy rating A	Effectiveness rating 2
<p><i>6. Asset maintenance</i></p> <p>Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.</p>		
<p>Observations</p>		
<p><i>Policies and procedures for asset maintenance / sample activities</i></p> <p>First line maintenance is provided by Worsley Alumina and major maintenance by contractors. The major maintenance contractor has a long term contract over full maintenance cycles and includes a performance element related to availability. A resident engineer is present on site.</p> <p>Worsley use an IT system that coordinates tasks, incorporates condition, risk, breakdown and time based maintenance. The German business software SAP is used and has been well tailored to the host's specific maintenance needs. Worsley Alumina has not yet converted to the enterprise wide standard of 1SAP.</p> <p><i>Training / resources / exceptions</i></p> <p>Maintenance is scheduled well into the future and these actions appear appropriate for the type of equipment. The resourcing is appropriate and ongoing training is evident as are the operating procedures and practices. High Voltage training occurs. Plant maintenance appears to take due allowance of any exceptions in the licensed plant.</p> <p><i>Evaluation Criteria summary</i></p> <ul style="list-style-type: none"> • Maintenance policies and procedures are documented and linked to service levels required <p>Response: The local AMS meets this criterion with service standards defined. Policies and procedures are documented. The contract with the manufacturer for maintenance has penalties for not meeting the service availability.</p> <ul style="list-style-type: none"> • Regular inspections are undertaken of asset performance and condition <p>Response: The local AMS meets this criterion with inspections undertaken as part of manufacturer's maintenance conditions.</p> <ul style="list-style-type: none"> • Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule <p>Response: The AMS meets this criterion. Maintenance plans are documented and completed on schedule. The equipment manufacturer requires maintenance to their standard and frequency to validate warrantee conditions.</p> <ul style="list-style-type: none"> • Failures are analysed and operational/maintenance plans adjusted where necessary <p>Response: Failures are analysed and adjustments made where necessary.</p> <ul style="list-style-type: none"> • Risk management is applied to prioritise maintenance tasks <p>Response: Risk management is the key method of prioritising maintenance tasks.</p> <ul style="list-style-type: none"> • Maintenance costs are measured and monitored <p>Response: Maintenance costs are measured and monitored.</p> <ul style="list-style-type: none"> • System maintenance strategy, including the methodology used to maintain the system and frequency of maintenance activities. <p>Response: The AMS meets this criterion with maintenance strategies defined.</p> <ul style="list-style-type: none"> • Performance measures such as unplanned outages 		

Response: Outage log including forced outages has been implemented.							
Asset management process and policy definition							
Process	<input checked="" type="checkbox"/>	Policy	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>		
Evidence: Interviewed Andy Wearmouth and listed staff on site. Inspected site. Documents: Include Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.							
Asset management performance							
Process	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	Availability	<input checked="" type="checkbox"/>	Use	<input checked="" type="checkbox"/>
Issues							
<p>The Licensee carried a review of the status of the generator and that revealed that windings need repair at the next major shutdown and turning gear needs close monitoring and rectification of problems that may emerge.</p> <p>The maintenance is appropriate for the duty required. Early corrosion and other problems in the heat recovery boiler have been resolved early in the plant life and no issues have occurred during the audit period.</p>							
Recommendation							
Reports on action taken on generator windings and turning gear be available for the next review. (Non mandatory recommendation Audit guidelines 11.4).							

Asset Management Information System	Process/Policy rating A	Effectiveness rating 1				
<p><i>7. Asset Management Information System (MIS)</i></p> <p>An asset management information system is a combination of processes, data and software that support the asset management functions.</p>						
<p>Observations</p>						
<p><i>Policies and procedures</i></p> <p>The licensee uses Worsley's IT system which is very appropriate for the function. The major maintenance contractor has their own IT system. The Licensee has efficiency and financial models on spreadsheets.</p> <p><i>Exceptions</i></p> <p>The plant major failure was appropriately analysed and the plant restored to service.</p> <p><i>Evaluation Criteria summary</i></p> <ul style="list-style-type: none"> • Adequate system documentation for users and IT operators Response: The SAP system is sufficiently documented. It is easy to use and reasonably intuitive, there are user manuals. Spreadsheets are used by the Licensee for operational and financial performance models. • Input controls include appropriate verification and validation of data entered into the system Response: The system is easy to use with a maintenance focus rather than a database focus and includes appropriate verification and validation of data entered into the system. • Logical security access controls appear adequate, such as passwords Response: Logical control is adequate with hierarchical access by password. • Physical security access controls appear adequate Response: Physical security is adequate with the system on access controlled mine site. • Data backup procedures appear adequate Response: Data backup is robust. • Key computations related to Licensee performance reporting are materially accurate Response: Key computations related to Licensee performance reporting are materially accurate, to the extent possible to assess with visual inspection. Consistent with the scope limitations, inspection of the Licensee's systems did not show any apparent errors. • Management reports appear adequate for the Licensee to monitor licence obligations Response: Management reports appear adequate for the Licensee to monitor licence obligations to the extent possible to assess with visual inspection. Sighted a version of the monthly report with indications of progress against preventive maintenance, completion of actions from audits and incident reports, environmental compliance, commentary about compliance with system management needs. 						
<p>Asset management process and policy definition</p>						
Process	<input checked="" type="checkbox"/>	Policy	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	

Evidence: Interviewed Andy Wearmouth and listed staff on site. Inspected site. Documents: Include Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.							
Asset management performance							
Process	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	Availability	<input checked="" type="checkbox"/>	Use	<input checked="" type="checkbox"/>
Issues							
None							
Recommendation							
None							

Risk management	Process/Policy rating B	Effectiveness rating 2					
<p><i>8. Risk management</i></p> <p>Risk management involves the identification of risks and their management within an acceptable level of risk.</p>							
<p>Observations</p>							
<p><i>Policies and procedures</i></p> <p>The licensee uses Verve's risk management processes. The plant is fully insured. These are appropriate for the operation and maintenance of the plant The operators (Worsley Alumina are responsible for safety and environmental management.</p> <p><i>Training</i></p> <p>There is evidence of training and awareness by staff of risk based approaches particularly in approaches to tasks where JSA (Job Safety Analysis) are prepared for all work (by Worsley Alumina – the operators).</p> <p><i>Evaluation Criteria summary</i></p> <ul style="list-style-type: none"> • Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system <p>Response: The AMS meets this criterion. Risks are assessed and drive maintenance in particular, especially for maintenance contracted to the manufacturer.</p> <ul style="list-style-type: none"> • Risks are documented in a risk register and treatment plans are actioned and monitored <p>Response: While the AMP and other documents cover risks and responses there is not an explicit risk register with documented risk assessments and responses.</p> <ul style="list-style-type: none"> • The probability and consequences of asset failure are regularly assessed <p>Response: The probability and consequences of asset failure are regularly assessed.</p>							
<p>Asset management process and policy definition</p>							
Process	<input checked="" type="checkbox"/>	Policy	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>		
<p>Evidence: Interviewed Andy Wearmouth and listed staff on site. Inspected site. Documents: Include Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.</p>							
<p>Asset management performance</p>							
Process	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	Availability	<input checked="" type="checkbox"/>	Use	<input checked="" type="checkbox"/>
<p>Issues</p>							
<p>There would be a benefit in consolidating the risk assessments in a risk register with appropriate responses</p>							
<p>Recommendation</p>							
<p>A risk register should be developed along with appropriate responses. (Non mandatory recommendation Audit guidelines 11.4).</p>							

Contingency planning	Process/Policy rating B	Effectiveness rating 2				
<p><i>9. Contingency planning</i></p> <p>Contingency plans document the steps to deal with the unexpected failure of an asset.</p>						
<p>Observations</p>						
<p><i>Development of contingency plans / currency</i></p> <p>There are contingent processes for loss of fuel which are discussed under environmental analysis.</p> <p>The major maintenance contractor has performance incentives in the contract and has people immediately available to deal with breakdown matters.</p> <p>The Licensee has detailed maintenance scheduled out for several years, with minor and major shutdowns allowed to deal with potential issues.</p> <p>The maintenance regime is geared to keeping the plant operational without forced outages.</p> <p>The mode of operation and maintenance together with recommended major service provided should mitigate major breakdowns. The licensee has contracted the plant manufacturer to provide the major maintenance and this contract has performance conditions.</p> <p>There are spares holding and the plant is the same as others in Verve's fleet (Verve is a joint venture partner).</p> <p><i>Testing of contingency plans</i></p> <p>The Licensee tests safety systems routinely.</p> <p><i>Evaluation Criteria summary</i></p> <ul style="list-style-type: none"> Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks <p>Response: There are no explicit documented contingency plans.</p> <p>There are spares holdings and interchangeability with other similar machines in the fleet.</p> <p>There are fuel strategies as part of the refinery and Verve's gas holdings (under which it is allocated gas)</p> <p>spare 132KV cable and joints held for possible interconnecting cable faults</p> <p>There is no documented contingency plans.</p>						
<p>Asset management process and policy definition</p>						
Process	<input checked="" type="checkbox"/>	Policy	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	
<p>Evidence: Interviewed Andy Wearmouth and listed staff on site. Inspected site.</p> <p>Documents: Include Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.</p>						

Asset management performance							
Process	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	Availability	<input checked="" type="checkbox"/>	Use	<input checked="" type="checkbox"/>
Issues							
There are no documented contingency plans.							
Recommendations							
Consideration is given to developing contingency plans arising from risk register and other identified risks (Non mandatory recommendation Audit guidelines 11.4).							

Financial planning	Process/Policy rating A	Effectiveness rating 1				
<p><i>10. Financial planning</i></p> <p>The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term.</p>						
<p>Observations</p>						
<p><i>Financial planning process / plans</i></p> <p>The Licensee has financial plans, budgeting and monitoring processes. These are on an annual basis and upgraded year by year.</p> <p>The Licensee's managers are responsible for reporting actual versus budget. Revenue is retained for maintenance and capital expenditure where that is required is within the retained funds capacity or by submission to the Joint venturers.</p> <p><i>Evaluation Criteria summary</i></p> <ul style="list-style-type: none"> • The financial plan states the financial objectives and strategies and actions to achieve the objectives <p>Response: There is a financial model that addresses performance and strategies to get required outcomes.</p> <ul style="list-style-type: none"> • The financial plan identifies the source of funds for capital expenditure and recurrent costs <p>Response: The model meets the requirements with retained earnings used for capital expenditure and recurrent costs where that is within the retained funds capacity.</p> <ul style="list-style-type: none"> • The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) <p>Response: The financial plan provides projections of operating statements (profit and loss) but not a statement of financial position (balance sheets).</p> <ul style="list-style-type: none"> • The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period <p>Response: The financial plan provides predictions on income for the next five years and indicative predictions beyond this period.</p> <ul style="list-style-type: none"> • The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services <p>Response: The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services.</p> <ul style="list-style-type: none"> • Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary <p>Response: Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary.</p>						
<p>Asset management process and policy definition</p>						
Process	<input checked="" type="checkbox"/>	Policy	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	
<p>Evidence: Interviewed Andy Wearmouth and listed staff on site. Documents: Asset Management plan, Generator condition report, Outage reports, inspection reports,</p>						

Financial statements.							
Asset management performance							
Process	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	Availability	<input checked="" type="checkbox"/>	Use	<input checked="" type="checkbox"/>
Issues							
None							
Recommendation							
None							

Capital expenditure planning	Process/Policy rating A	Effectiveness rating 2				
<p><i>11. Capital expenditure planning</i></p> <p>The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years.</p> <p>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.</p>						
<p>Observations</p>						
<p><i>Capital expenditure process / plans</i></p> <p>The Licensee has financial plans, budgeting and monitoring processes. There no capital expenditure planned in the short term.</p> <p>Revenue is retained for capital expenditure where that is within the retained funds capacity. Only at a point where equity is required to be injected/funded from the owners will that occur. There has been no budget for any equity injection/funding.</p> <p><i>Evaluation Criteria summary</i></p> <ul style="list-style-type: none"> • There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates Response: The mode meets the obligations but there is no likelihood of capital expenditure in the short term (up to decision on stage 2 of the power/ steam procurement agreement). The expenditure is that required to maintain to the manufacturer’s requirements or any breakdowns is scheduled. • The plan provide reasons for capital expenditure and timing of expenditure Response: The model meets the obligations capital expenditure is scheduled according to the service frequency (blade replacement etc) as required by the manufacturer. • The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan Response: The model meets the obligations. The capital expenditure is that required to maintain to the manufacturer’s requirements or any breakdowns. • There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned Response: The model meets the obligations as the capital expenditure plan is updated annually. 						
<p>Asset management process and policy definition</p>						
Process	<input checked="" type="checkbox"/>	Policy	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	
<p>Evidence: Interviewed Andy Wearmouth and listed staff on site. Documents: Include Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.</p>						

Asset management performance							
Process	<input checked="" type="checkbox"/>	Documentation	<input checked="" type="checkbox"/>	Availability	<input checked="" type="checkbox"/>	Use	<input checked="" type="checkbox"/>
Issues							
None.							
Recommendation							
None							

Review of AMS	Process/Policy rating Not Rated	Effectiveness rating Not Rated					
<p>12. <i>Review of AMS</i></p> <p>The asset management system is regularly reviewed and updated.</p>							
Observations							
<p>As a supplier of electricity the service delivery is heavily asset based and needs an AMS. There is ongoing review of asset issues relating to operations, maintenance and contingencies.</p> <p><i>Evaluation Criteria summary</i></p> <ul style="list-style-type: none"> A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current Response: The review of the strategic level aspects cannot be undertaken by the Licensee but the joint venture agreement can be reviewed. Independent reviews (e.g. internal audit) are performed of the asset management system Response: The review of the broader aspects cannot be undertaken by the Licensee. Review of the joint venture is assigned to the Facility Manager. 							
Asset management process and policy definition							
Process	<input type="checkbox"/>	Policy	<input type="checkbox"/>	Documentation	<input type="checkbox"/>		
Evidence: Interviewed Andy Wearmouth and listed staff on site. Documents Asset Management plan, Generator condition report, Outage reports, inspection reports, Financial statements.							
Asset management performance							
Process	<input type="checkbox"/>	Documentation	<input type="checkbox"/>	Availability	<input type="checkbox"/>	Use	<input type="checkbox"/>
Issues							
<p>Strategic asset planning is carried out by the joint venture partners and they carry out continuous review of the process. The Licensee cannot carry out strategic asset planning as the Licensee's business model and resources are those consistent with operating and maintaining gas turbine generation plant and they do not have the capacity to undertake asset review functions outside the licensed plant.</p> <p>The Licensee periodically reviews the agreement and operational and maintenance arrangements to see that it is meeting their requirement considering whatever changes in the environment or market that have occurred. The strategic directions of the Licensee are routinely considered at meetings of the joint venture partners.</p>							
Recommendation							
None							