McGill Engineering Services Pty Ltd

Engineering, Adjudication & Arbitration Services ABN 45 106 691 169

VERVE ENERGY

(ELECTRICITY GENERATION CORPORATION)

GENERATION LICENCE EGL 7

ASSET MANAGEMENT SYSTEM REVIEW

Prepared By Kevan McGill
Date 25 July 2010

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McGill Engineering Services Pty Ltd

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Wendy Ng
Manager Strategy & Regulation
Verve Energy
William Street
PERTH WA 6000

Dear Dr Ng

Asset Management System Review Electricity Licence EGL 7

The fieldwork on the asset management system review of Generation licence EGL 7, for the review period (1 April 2008 to 31 March 2010) is complete and I am pleased to submit the report to you. The report reflects my findings and opinions.

In my opinion, the Licensee maintained, in all material aspects, effective control procedures in relation to the Generation licence (EGL 7) and, the Licensee maintained, in all material aspects, an effective asset management system in relation to the Generation licence (EGL 7) for the review period on the relevant clauses referred to within the objectives section of this report.

Yours sincerely

Kevan McGill
Director

Date 25 July 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 audit/review period (1 April 2008 to 31 March 2010).

The Licensee is the largest generator in the SWIS and is government owned. While consistent with the independent power producers in supplying base load and peaking power, the Licensee provides mid merit power and ancillary services to support the network. This means that there is plant in the Licensee's portfolio which is not operated in the most efficient manner with the consequence that such operation for plant not designed for the purpose reduces the remaining operating life.

OVERALL CONCLUSION

In my opinion, the Licensee maintained, in all material aspects, effective control procedures in relation to the Generation licence (EGL 7) and, the Licensee maintained, in all material aspects, an effective asset management system in relation to the Generation licence (EGL 7) for the review period on the relevant clauses referred to within the objectives section of this report.

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 using the scales described below.

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).

Asset management review effectiveness rating scale

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

Asset management effectiveness summary

ASSET MANAGEMENT SYSTEM	Asset management process and policy definition adequacy rating	Asset management performance rating
Asset planning	A	2
Asset creation/ acquisition	A	1
Asset disposal	A	1
Environmental analysis	A	1
Asset operations	A	1
Asset maintenance	A	1
Asset Management Information System	A	1
Risk management	A	2

Contingency planning	A	1
Financial planning	A	1
Capital expenditure planning	A	1
Review of AMS	A	2

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 May and June 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.

The recommendations identified in the previous review were examined and the outcomes included in this report.

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 7 for Verve Energy.

REVIEW (AUDIT) PERIOD

The review (audit) period is 1 April 2008 to 31 March 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.

The actions to follow up previous audits are detailed below.

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

The key contacts were:

- Licensee
  - Wendy Ng — Manager Strategy and Regulation
    Karen Bateman — Manger Audit and Risk
    Konrad Lajszczak — Manager Financial Planning & Analysis

- The key site contacts for Muja are
  Hans Dopheide - Manager Muja Power Station
  Ivan d'Rosario - Operations Superintendent
  Michael Hill - Maintenance Superintendent
  Ian Norminton - Engineering Superintendent

  The key site contacts for Kwinana are
  Roy Zylstra - Manager Kwinana Power Station
  John Rampellini - Operations Superintendent
  Richard Corbett - Maintenance Superintendent
  Reece Tonkin - Engineering Superintendent
  The key site contacts for Cockburn is
  Rob Rowland - Engineering Maintenance Superintendent
  The contact for Collie is
  Willie Venter - Contract Manager

  The contact for Albany Wind farm is
  David Thompson - Maintenance Coordinator

The contact for Gas Turbines and Sustainable Operations is
Kim Bycroft Operations Superintendent

- McGill Engineering Services Pty Ltd
    - Kevan McGill, John McLoughlin

The audit was conducted during May to July 2010. Kevan McGill took about 100 hours on the Asset management review and John McLoughlin took 30 hours.

\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; • 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.

LICENSEE BUSINESS

The Licensee is the largest generator (approximately 3000 MW of capacity) operating in the Wholesale Electricity Market and it also operates a number of remote generation plant. In the SWIS it operates base load and peaking plant similar to other power providers but also carries out the mid merit and balancing roles for system support. The Collie, Muja, Cockburn and Kwinana generating stations and Albany wind farm have been inspected and interviews have taken place at Perth and Kewdale Offices.

ITEMS FROM LAST REVIEW

AMS item	Recommendation	Responsible	When	Actions taken/ Further Action
Asset planning	Consideration is given to visible triggers for a review of the asset mission report.	Chief Operating Officer	October 2008	Complete, part of annual Government process of approving Corporate Intent which triggers strategic planning process. No further action required.
	To maintain portfolio capacity at 3000 MW, strategies for expediting portfolio replacement given the long lead time for replacement will be examined.	Chief Operating Officer	July 2009	Complete, Government approval of plans such as the High Efficiency Gas Turbines at Kwinana achieved. No further action required.
Asset operations	Investigations, with appropriate independent expert input, into the safety issues at Muja about burning wood in a coal plant are completed before any further action with this material is considered at Muja.	Chief Operating Officer	July 2009	Complete, burning of wood ceased. No further action required.
Asset maintenance	Consideration is given to gas turbines and renewable systems using Ellipse for maintenance scheduling for gas turbines for portfolio wide consistency.	Chief Operating Officer	Dec 2008	Complete, Ellipse is now used by Gas Turbines section. No further action required.

Risk management	An inspection system is put in place to ensure bush fire mitigation is effective, particularly at Muja.	Chief Operating Officer	October 2008	Complete, Inspections have taken place. Further action is to implement clearing consistent with outcomes of threatened and endangered flora survey. This is subject to approval by the Department of Conservation and Environment.
AMS review	A process be implemented that schedules regular review of the asset management system.	Chief Operating Officer	Dec 2008	Complete, part of annual Government process of approving Corporate Intent which triggers strategic planning process. No further action required.

FINDINGS

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

1. *Asset planning* Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).
Recommendation
The position on Kwinana A should be monitored and considered – is it in a state to be possibly reactivated or is it in a removal process as the care and maintenance program for the turbines and boilers are not consistent post retirement. (Non mandatory recommendation – Audit Guidelines 11.9)
8. Risk management Risk management involves the identification of risks and their management within an acceptable level of risk.
Recommendation
The effectiveness of fire management should be monitored when the survey of endangered flora is complete at Muja. An inspection should be scheduled after bush fire clearing. (Non Mandatory recommendation – Audit guidelines 11.9).

REVIEW EVIDENCE

The following documents were reviewed.

- Generation licence
- Statement of Corporate Intent
- Risk management plan (policy, framework and registers)
- Sample tender documents
- Kwinana Stage B demolition tender documents
- Long term Strategic guideline discussion paper on plant reinvestment options
- Corporate strategic plan
- RWE consultants options paper
- Unit cold start procedure Kwinana
- Budget papers

- Production budget process
- Ellipse maintenance process
- Wind farm spares – Albany
- Enercon specifications and ramp down control Albany wind turbines
- Portfolio outage statistics

ASSET MANAGEMENT SYSTEM REVIEW RESULTS AND RECOMMENDATIONS

Asset Planning	**Process/Policy rating** A	**Effectiveness rating** 2
1. *Asset planning* Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).		
Observations		
Asset Planning Process/Plan and its currency The Licensee conducted a strategic review of generation in 2007 for the period 2007-2012. The review, (the portfolio asset mission report) gives a good overview of the generation assets and the issues facing each item of major plant. Strategic reviews have and continue to be conducted to consider the strategic position of the Licensee and the consequent asset planning strategies. This asset management plan articulates how the assets (power stations) will be managed to meet short term operational requirements whilst maintaining the long term performance and integrity of the assets by : ➢ Identifying how the mission statements are to be achieved ➢ 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 ➢ Containing an investment plan which can be used for budgeting and presenting business cases ➢ Providing future requirements for the assets; it is a forward looking document ➢ Providing a long term view of the portfolio by stating its current condition, what is expected of it in the future and how those expectations will be achieved Under this asset mission report the individual power stations have asset management plans. These plans are very detailed setting out the operational and maintenance items in detail. The small systems have a similar asset mission report which is appropriate for smaller systems. The Asset management plans are developed from portfolio level to power station level. At the power station level, the station manager and key staff are responsible for the plan outcomes and all staff are responsible for outcomes through policy documents.		

The key customer service levels for generators relate to availability (the lights stay on) and for this generator, the costs. Costs are related to fuel and utilization of their plant – using the plant to capacity and operational efficiency particularly thermal efficiency (electricity output for fuel input).

Evaluation Criteria summary

- Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning

Response: The Licensee's business is electricity generation and its substantial strategic effort is in essence asset management. It has a business planning process which starts from the annual strategic development process with Government which flows down and connects with the bottom up process from the power stations setting out their needs. It in particular has a portfolio asset mission report which largely fills the roles of an asset management plan.

- Service levels are defined

Response: Service levels are defined in the strategic plans such as the key reports to government (Statement of Corporate Intent), the portfolio mission report and documents such as the risk management plans. The Key Performance Indicators (KPIs) for each power station are collected and reported to the Chief Operating Officer.

- Non-asset options (e.g. demand management) are considered

Response: The key non asset management strategy for generators is to maximize the utilization of their existing plant. Utilization includes using the capacity to the best extent possible (loading up the machines) and maximizing operational efficiency. The Licensee is responsible for the utilisation of the existing plant which is lower than ideal, given the priority of despatch on the SWIS, the age of some of the assets and performing ancillary service roles. (Plant is despatched by Western Power's System Management). Essentially much of the plant was originally base load plant but has slid down the despatch order as newer more efficient plant becomes available. This means that plant is used in less than optimal modes than ideal from the Licensee's perspective. For example the Cockburn combined cycle gas turbine is the most efficient plant in the portfolio but is not despatched continuously at full load.

- Lifecycle costs of owning and operating assets are assessed

Response: Lifecycle costs of owning and operating assets are assessed routinely as part of both portfolio and power station management. The UK consultants RWE are examining life cycle issues for the portfolio.

- Funding options are evaluated

Response: Funding and in particular funding restraints are an important strategic issue for the Licensee. Development proposals are evaluated with funding options given the potential funding restraints. For example a report on plant reinvestment options was sighted.

- Costs are justified and cost drivers identified

Response: Costs of the plant are monitored and costs are justified and cost drivers routinely identified as part of both portfolio and power station management.

- Likelihood and consequences of asset failure are predicted

Response: There are risk assessments of asset failure and consequences in the risk management plan and station management functions. For example a fault in plant such as a unit at Kwinana was investigated to establish the cause and in particular if it could be a systemic issue. A regime of hot, warm and cold starts was developed to maximize the remnant life of the plant.

- Plans are regularly reviewed and updated

Response: The Licensee has managers assigned for strategic management and internal review and their roles are to review and update plans. The power station plans feed up to the regular strategic planning process. UK consultants RWE are engaged on a 2 year cycle to review plant condition and recommend life options.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Wendy Ng, Karen Bateman and listed staff on site. Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent, Sample demolition plans, Sample tender documents, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options, Production budget process and portfolio outage statistics.

Asset management performance

Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues

The Licensee has a number of generation units that have scheduled retirement dates but replacement strategies are constrained by Government policy (3000 MW limit) and funding restraints. Some 720MW of coal (or dual) fired plant was scheduled to be retired by 2009. Kwinana Stage B (2* 120MW) has been removed – with the space to be used for 2 high efficiency gas turbines. Stage A of Kwinana is to be placed into care and maintenance in 2011 but the plan seems inconsistent in that the turbines will be maintained in a viable state but the boilers in a lesser position. The removal of Muja Stages A/B (4* 60MW) has been reconsidered following the Varanus gas problems. Recommissioning of the Muja plant is proceeding but will not be committed until later in 2010.

Additional wind turbines are scheduled for the Albany wind farm.

While gas turbines have shorter procurement time than coal plant, it increases the gas dependency for the Licensee (reduces fuel diversity). Fuel diversity is not directly an issue for the Licensee but a strategic position on fuel diversity needs to be examined for system security. Like all generators the Licensee makes commercial decisions about what capacity it wishes to have in response to the market signals. The Licensee's strategic position is to be a generator with a 3GW limit with at least 50% market energy share. Whether this is adequate for system capacity (system security) is an issue for the IMO (Independent Market Operator).

The annual Government process of approving the Statement of Corporate Intent triggers the strategic planning process leading to review of plans such as the asset mission statement.

The power stations each have asset management plans that are upgraded annually but this is at a level of detail that does not have to be reported to the *Authority* being maintenance /outage plans.

While the Licensee needs replacements for scheduled plant retirements, capacity in the

system (security) is the responsibility of the IMO
Recommendations
The position on Kwinana A should be monitored and considered prior to its retirement in 2011– is it in a state to be possibly reactivated or is it in a removal process as the care and maintenance program for the turbines and boilers are not consistent post retirement.
Rating
Process/Policy rating A **Effectiveness rating** 2

Asset Creation	**Process/Policy rating** A	**Effectiveness rating** 1
2 Asset creation and acquisition 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		
Policies and procedures for asset creation / sample creation activities Procurement of major generating plant is a very significant exercise taking considerable time. Plant such as High Efficiency Gas Turbines (HEGT) at Kwinana Power Station requires approvals to the highest levels of Government. The Licensee has followed appropriate procedures in the development of HEGT and while the HEGT is proceeding it not complete in the review period. *Meeting statutory obligations* There are documents requiring employees and contractors to meet statutory obligations. The asset creation processes are appropriate. *Evaluation Criteria summary* • Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions Response: The Licensee undertakes full project evaluation of new assets versus better utilization of existing assets (which is the prime non asset option for a generator).The Licensee has to seek Government approval of major projects and this has to be supported by full project evaluations. • Evaluations include all life-cycle costs Response: Life cycle costing is key driver of project assessments both at portfolio and power station proposals. UK consultants RWE are engaged on a 2 year cycle to review plant condition and recommend life options. • Projects reflect sound engineering and business decisions Response: Projects reflect sound engineering and business decisions with Board and for major projects government assessments. Additional engineering resources are being added to power station staffing to ensure professional development and assessment of engineering and business decisions. For all major projects independent advice is sought. • Commissioning tests are documented and completed Response: Commissioning tests are routinely documented and completed. The risks are		

too high for safety and performance to do otherwise and the base line for warrantee issue has to be established to ensure the manufacturer's warrantee is not voided. Collie and Cockburn were comprehensively commissioned but this was outside the review period.

- Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood

Response: Legal/environmental and safety obligations are assigned in policy documents and employment contracts and environmental and safety audits are conducted on an ongoing basis.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Wendy Ng, Karen Bateman and listed staff on site. Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent, Sample demolition plans, Sample tender documents, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options, Production budget process and portfolio outage statistics.

Asset management performance

Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues

The procurement processes are appropriate.

Ratings

Process/Policy rating	A	**Effectiveness rating**	1

Asset Disposal	**Process/Policy rating** A	**Effectiveness rating** 1

3. Asset disposal

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.

Observations

Policies and procedures for asset disposal / sample disposal activities
The Licensee has a number of generation units that are scheduled for retirement or were retired only to be put back into service following the 2008 gas crisis. There are very significant issues that can arise post retirement before the assets can be safely removed, sites remediated and/or passed to new owners. The issue with hazardous materials and even remotely possible heritage issues require planned management. East Perth and South Fremantle Power Stations are examples of these types of matters.

As a heritage item, the Wellington Dam Hydro plant has been transferred to the National Trust as disposal was not an option. The asset management suite of plans is generic with no specific reference to plant such as Wellington Hydro. Consequently the handing

over to the National Trust was not required to be reported to the Authority as a change to the asset management system (but to advise to remove from licence).

The retirement strategies are well defined.

Kwinana stage B has been removed with no significant issues with the area of the previous boiler plant having been made available for the proposed HEGT plant.

The current plans for Muja stages A/B do not involve removal of the plant but reinstatement proposals are proceeding.

The disposal processes are well defined. The strategic plans and risk management plans consider the poor performance of assets and the RWE consultancy is providing specific advice.

Meeting statutory obligations
There are well documented obligations of the Licensee and their employees to comply with statutory obligations.
Evaluation Criteria summary

- Under-utilised and under-performing assets are identified as part of a regular systematic review process

Response: The performance of plant is a routine element of power station and portfolio management and is continuously under review. The Licensee critically examines underutilized and under-performing plant. For example has employed UK consultants RWE to examine the performance of its plant and recommend strategies to improve plant life. This is critical as a number of former base load power stations are lower in the despatch priority due to their age and are running in modes that are different from their base load design.

- The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken

Response: The Licensee critically examines underutilized and under-performing plant. For example has employed UK consultants RWE to examine the performance of its plant and recommend strategies to improve plant life. This is critical as a number of power stations are lower in the despatch priority due to their age and are running in modes that are different from their base load design. In addition the Licensee has obligations in the WEM which sees it as the sole supplier of ancillary services of relevance which requires running plant in sub optimal modes that other suppliers do not have.

- Disposal alternatives are evaluated

Response: Disposal options are evaluated. For example, the decision at Kwinana was to remove Stage B and replace with gas turbines and Wellington Hydro was assessed as having one option as a heritage item of not disposing but passing to a body such as National Trust.

- There is a replacement strategy for assets

Response: The Licensee has strategic development options for replacement plant subject to the generation limit applied by government and funding availability.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Wendy Ng, Karen Bateman and listed staff on site. Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent,

Sample demolition plans, Sample tender documents, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options, Production budget process and portfolio outage statistics.							
Asset management performance							
Process	☑	Documentation	☒	Availability	☑	Use	☑
Issues							
None.							
Recommendation							
None							
Ratings							
Process/Policy rating A **Effectiveness rating** 1							

Environmental analysis	**Process/Policy rating** A	**Effectiveness rating** 1

4. Environmental analysis

Environmental analysis examines the asset management system environment and assesses all external factors affecting the asset system.

Observations

Standards / monitoring / reporting / breaches
The Licensee has a number of environmental licences and no unresolved issues have arisen with respect to environmental matters. Issues about air and water quality are being managed actively. The Licensee conducts internal audits of their environmental licence obligations. No non compliances have been reported.

The principal external threats to the generation assets relate to availability of fuel and storms to distribution and transmission. The Licensee has documented the threats to specific plant and developed contingencies for these threats. Major breakdowns are an internal issue covered under contingencies.

External threats are well developed both at a portfolio level and at generation station level in the risk management plan and strategic planning documents. The Strategic plan considers opportunities. Performance standards are monitored as key drivers of the planning processes such as the risk management plan and strategic planning proposals.

Evaluation Criteria summary

- Opportunities and threats in the system environment are assessed

Response: Opportunities/threats for the whole portfolio and at power stations are assessed in the strategic plans, portfolio asset mission, environmental and risk management plans.

- Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved

Response: Performance standards are routinely measured and achieved. KPIs are

monitored monthly and subject to internal review and audit.

- Compliance with statutory and regulatory requirements

Response: The Licensee's policy documents require compliance with statutory and regulatory obligations. There have been no environmental breaches.

- Achievement of customer service levels

Response: Availability and cost are the key customer service levels. Performance levels have improved and the provision for unavailability which is key measure of plant performance is better than budgeted. Costs are routinely monitored at power station and portfolio level.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Wendy Ng, Karen Bateman and listed staff on site. Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent, Sample demolition plans, Sample tender documents, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options, Production budget process and portfolio outage statistics.

Asset management performance

Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues

In the broader strategic planning context of environmental scanning, a generator has the discretion of deciding what level of generation it wishes and what fuel/s that it wishes. It is not the responsibility of the Licensee to ensure that there is sufficient capacity in the power system for system security or of fuel diversity. It also has the discretion to provide system support such as back up for wind generation or not. These are the domain of the IMO to ensure that it has sufficient resources and the pricing structures to give generators the incentive to provide the system with all the elements of a secure power system. The Licensee is carrying out appropriate strategic planning to meet this asset management criterion.

The Licensee provided system support during the 2008 gas shortage. The IMO should provide extra flexibility to deal with such contingencies.

Recommendation

None

Ratings

Process/Policy rating	A	**Effectiveness rating**	1

Asset operations	**Process/Policy rating** A	**Effectiveness rating** 1

5. Asset operations

Operations functions relate to the day-to-day running of assets and directly affect service

levels and costs.

Observations

Policies and procedures for asset operation / sample activities
Operational costs are closely monitored as they are a key indicator of performance. The asset register is part of the maintenance system – Ellipse.

The Licensee has extensively used consultants RWE (UK consultants RWE is one of Europe's five leading electricity and gas companies. It is active in the generation, trading, transmission and supply of electricity and gas) to determine risk management strategies to extend the life of the plant. These strategies involve identifying emerging risks for the plant and possible solutions.

Kwinana Power Station (KPS) consists of 4 units and provides multiple-fuel burning capability to the portfolio. KPS Stage C consists of 2 x 200MW units capable of burning gas, coal (reduced capacity) or oil. KPS Stage A consists of 2 x 120MW units capable of burning gas or coal and is due to be retired in 2011. Although coal firing was planned to cease at KPS at the end of June 2008, a decision has been made to extend coal firing until end of station life. Liquid fuel firing has been re-introduced on some units for back-up during gas supply shortages. The KPS plant has for many years provided mid-merit operation, often being dispatched to meet the morning and afternoon peak loads, and system support functions but is now supplying peak load support. As a result of this all of the KPS plant has been stressed, (base load plant may start only 1 or 2 times a year with very little thermal cycling but Kwinana may start 1 or 2 times a day with the resulting stresses. Automation has resulted in the operator's role being one of monitoring and apart from decisions on fuel mix and MW output set point the operator mainly is monitoring for alarms.

Cockburn Power Station Unit 1, a combined cycle plant which entered commercial operation during October 2003, is the most efficient plant within the portfolio and is intended to be operated base load within its load range of 160 MW – 240 MW. While it is the most efficient plant in the portfolio, the plant has tended to be operated as mid merit plant (for which it was specified) due to an excess of base load facilities on the system restricting its operation.

Muja Power Station (MPS) is the state's largest power plant and consists of 8 units of varying capacity, age, efficiency and reliability. Each unit on Muja Stage D has a maximum rating of 227 MW and achieves similar sent-out efficiency to Collie. (215 MW is the maximum sent out capacity while 227 MW is the up-rated nameplate (generating) capacity). Muja is operated as base load with stage D despatched first followed by stage C. The overnight load on these units is lower. The plant's reliability has increased compared to the previous review period as a result of increased preventative maintenance focus. Muja Stage C consists of 2 x 200MW units and has seen an improvement in reliability over recent years. Muja Stages A and B were retired in April 2007. However Muja Stage B was temporarily returned to service to alleviate the impacts of the Varanus Island incident and re-retired in 2009. The proposed return of Stage A/B to operation is progressing.

Collie Power Station (CPS), consisting of a single unit, has a capacity of 340 MW. It is the largest and most efficient coal fired power station in the portfolio and, as such, is dispatched in a base load regime. It is currently providing high levels of reliability as expected from plant of its age. Operations are contracted to Transfield Worley (a large

and well reputed organisation).

The Licensee operates 17 gas turbines located in various parts of the state. The gas turbines are operated under varying despatch modes depending on their geographic location in relation to gas supply pipelines, their operating efficiency and the role they play in contractual arrangements between Verve Energy and other organisations. Typically, the gas turbines provide peak load operation and necessary system support functions. The TiWest gas turbine is unique in that it is central to a power and steam supply agreement between the Licensee and TiWest Pty. Ltd.

The Albany wind farm (12* 1.8MW wind turbines) is operated automatically and can be operated by Western Power's System Management with capacity to vary generating capacity by varying wind vane angles. An extension of 6 units of about 2MW capacity is planned.

The turbines and remote plant (comprising wind farms and wind/diesel installations) are all automatically operated. System Management despatches the plant with the Licensee making the decisions about the merit order plant is despatched to manage hours used and maintenance.

The remote systems are contracted to Power Corp for operations and maintenance and supervised by the Licensee.

Training/ resources / exceptions
The Licensee operates the plant. The resourcing is appropriate and ongoing training commensurate with their responsibilities is evident as are the operating procedures and practices. Plant operation and related maintenance appears to take due allowance of any exceptions in the licensed plant.

Evaluation Criteria summary

- Operational policies and procedures are documented and linked to service levels required

Response: The Licensee has defined service standards and KPIs. Operational procedures are documented and designed to meet the required service standards and KPIs.

- Risk management is applied to prioritise operations tasks

Response: This criterion is satisfied with operations (maintenance predominantly) based on risk assessment. Automation has resulted in the operator's role being one of monitoring and apart from decisions on MW output set point the operator mainly is monitoring for alarms.

- 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 Ellipse IT system.

- 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 receive training commensurate with their responsibilities. Apart from individual training needs there is an employee development centre which covers training requirements for groups of people who are similarly qualified.

- Performance measures such as unplanned outages

Response: Outage log including forced outages are routinely monitored.							
Asset management process and policy definition							
Process	☑	Policy	☑	Documentation	☑		
Evidence: interviewed Wendy Ng, Karen Bateman and listed staff on site. Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent, Sample demolition plans, Sample tender documents, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options, Production budget process and portfolio outage statistics.							
Asset management performance							
Process	☑	Documentation	☒	Availability	☑	Use	☑
Issues							

The Kwinana plant operates mainly as peaking plant which leads to less than optimal running of plant that originally was base load and intended for few starts (extra starts increase maintenance requirements by subjecting the plant to thermal cycling during start up, shutdown and load variations). For example the plant often operates to start and shut down daily, decreasing efficiency and increasing maintenance. Risk management strategies for extending life are being explored with consultants RWE. The plant has been considerably automated including digital screen based operator interfaces, instrumentation and remote sensors and actuators. Optimal loading rates and control boundaries are programmed into the control system, so as to ensure that critical boiler and turbine components are not over stressed during transient conditions and that the units operate within safe limits. The evidence is that the plant is operated appropriately.

Gas turbines such as Cockburn, have highly prescribed maintenance requirements, and the service lives of hot gas path components are defined by the manufacturer. The lives of such components are determined by operating hours and numbers of starts under varying conditions. For example an isolated 18 hours run will be equivalent to 40 hours of continuous operation for equipment life purposes. The minimum load that the plant can be operated within the manufacturer's requirements is being explored as a counter to reducing starts. There are downsides to minimum load but allowing the plant to cool and restart also has downsides and the balance between these is being explored.

Muja plant has undergone a control and instrumentation upgrade but not as extensive as Kwinana in part because it was originally built to more modern standards. The important controls are automated but some subsystems are still manually initiated (and operate automatically in steady state). As Muja has less starts than Kwinana, problems associated with plant movements are less of an issue. The Licensee provides extra training for staff with simulators to run the machines up and down, given that they do not experience many starts and stops. The coal plant is operated and maintained under a contract. Muja is exploring with RWE consultants starting sequences. Consultants Parsons Brinkerhoff is examining minimum load capacities.

The use of biomass co-firing at Muja has ceased.

Collie had no major issues in the review period.

Muja restoration to service of Stages A & B was a significant exercise given that the plant had been placed in a care and preservation mode. The temporary reinstatement was

successful. The permanent reinstatement is progressing. One of the large Gas turbines at Pinjar station has a major fault and causes are being investigated.
Recommendation
None
Rating
Process/Policy rating A **Effectiveness rating** 1

Asset Maintenance	**Process/Policy rating** A	**Effectiveness rating** 1
6. Asset maintenance Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.		
Observations		
Policies and procedures for asset maintenance / sample activities Maintenance costs are closely monitored as they are a key indicator of performance. The asset register is part of the maintenance system – Ellipse [V 5.2.3.8]. Maintenance at the power stations operated by the Licensee is controlled by a sophisticated IT system (Ellipse) that coordinates tasks, incorporates condition, risk, breakdown and time based maintenance. Maintenance jobs are standardised when incorporated into Ellipse and automatically made part of the subsequent work order. This gives a quality and safety assurance and change management where by changing the standard job specification the work process is changed. Spare parts required for standard jobs and inventories are also contained in the system. Work orders are based on a risk assessed time or an inspection raised issue or fault caused and prioritised according to risk. The Ellipse system is planned to be further upgraded. Kwinana is operating with a maintenance regime for Stage A that will see it placed under care and maintenance in 2011. However it seems that the turbine maintenance is at a higher level than the boilers. Stage C has complete maintenance consistent with a long operating horizon. The Licensee provides first line maintenance with major outages contracted to an external company. KPS has extensively used consultants to determine strategies to extend the life of the plant. These strategies involve identifying emerging risks for the plant and possible solutions. A step-up power transformer had a failure at Kwinana but as a spare was available at Muja, the outage was minimised. The repair has been made and the spare is now available for portfolio use. Cockburn is operating at less than optimal conditions which are base load. The Licensee provides first line maintenance with major outages contracted to the manufacturer. Maintenance at Collie is contracted to Transfield Worley (a large and well reputed operator). The contractor uses a tailored version of the software used at the power		

stations operated by the Licensee.

Muja, other than stages A and B has complete maintenance consistent with a long operating horizon. The Licensee provides first line maintenance with major outages contracted to an external company. Stages A and B were on a care and preservation regime when they were retired from service with some equipment removed and stored as spares. Stage B was reinstated on a Government directive during this review period. A Muja stage A and B refurbishment is currently under consideration and will be subject to Ministerial approval.

The Albany wind farm is maintained by a contractor Enercon which is the equipment manufacturer. The Ellipse program is used to capture the work orders produced by the contractor to keep the maintenance history. The maintenance has to cope with the effects of the salt laden sea air and transformers and stairs are being serviced to deal with the corrosive effects. Solutions to salt condensation in the nacelles are being investigated.

The gas turbines have regular and time (relating to starts – starts are converted to hours) based maintenance. For the gas turbines the Licensee provides first line maintenance with major outages contracted to an external company and the remote system are contracted to an external company. Gas Turbine section is using the maintenance program Ellipse.

Training / resources / exceptions
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 at Western Power and College of Electrical Training. Plant maintenance appears to take due allowance of any exceptions in the licensed plant.

Evaluation Criteria summary

- Maintenance policies and procedures are documented and linked to service levels required

Response: The Licensee has defined service standards. Maintenance policies and procedures are documented and linked to service standards. KPIs such as availability, forced outages and thermal efficiency are routinely monitored.

- Regular inspections are undertaken of asset performance and condition

Response: Regular inspections are undertaken as part of manufacturer's maintenance conditions for newer plant and as part of procedures for older plant. There are scheduled outages to assess condition and condition monitoring sensors (such as vibration) and these are used to assess risk and corrective measures as required.

- Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule

Response: Maintenance plans are documented and completed on schedule. The equipment manufacturers require maintenance to their standard and frequency to validate warrantee conditions. The Ellipse system is used extensively to schedule and monitor progress of maintenance plans and contains the documentation of the work.

- Failures are analysed and operational/maintenance plans adjusted where necessary

Response: Failures are routinely analysed and adjustments made where necessary. Attention is paid to establish if the issue could also appear on other units or be systemic.

- Risk management is applied to prioritise maintenance tasks

Response: Risk management is the key method of prioritising maintenance tasks and to minimize unavailability of plant.

- Maintenance costs are measured and monitored

Response: Maintenance costs are routinely measured and monitored.

- System maintenance strategy, including the methodology used to maintain the system and frequency of maintenance activities.

Response: System maintenance strategies vary by power station depending on role, age and performance requirements and are closely managed by power station managers. Ellipse monitors and highlights when required.

- Performance measures such as unplanned outages

Response: Outage log including forced outages are routinely monitored.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: *interviewed Wendy Ng, Karen Bateman and listed staff on site. Documents:* Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent, Sample demolition plans, Sample tender documents, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options, Production budget process and portfolio outage statistics.

Asset management performance

Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues

The 2008 gas shortage demonstrated the need to keep plant in good operational state even if nearing the very end of its life such as the Kwinana and Muja plant.

Nacelle cooling at Albany is introducing salt air in certain atmospheric conditions and a solution is being investigated.

Recommendation

None.

Rating

Process/Policy rating	A	**Effectiveness rating**	1

Asset Management Information System	**Process/Policy rating** A	**Effectiveness rating** 1

7. Asset Management Information System (MIS)

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

Observations

Policies and procedures

The Licensee has a sophisticated asset management information system with a number of elements. Ellipse is the major component. It has complex spreadsheets managing expenditure and a dedicated maintenance management database to control a complex list of items. The maintenance system links project management to scheduled tasks to standard work plans (assisting with safety and change management), asset register and parts inventory. The Ellipse system is maintenance process oriented rather than data base oriented making the system easy to use for operators without strong reliance on documentation. There is support documentation in each power station but that was not often required for reference. A sample was suitable for the users.

There is a strong document management system to manage and give on line access to documents including drawings. All power stations are controlled access sites which provide adequate physical security for IT systems.

Access to write to the database is controlled (passwords) and changes are tracked. The systems are backed up regularly to ensure data integrity.

Exceptions

The reliability of the plant is evidence of good maintenances practices and that exceptions are being followed up.

Evaluation Criteria summary

- Adequate system documentation for users and IT operators

Response: The Ellipse system is well documented and is only used for reference requirements as the system is user friendly and as such documentation is not required routinely by users.

- 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 generation sites.

- Data backup procedures appear adequate

Response: Data is backed up daily and recovery is tested routinely with switch over to disaster recovery sites also tested.

- 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.

- 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.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Wendy Ng, Karen Bateman and listed staff on site. Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent,

Sample demolition plans, Sample tender documents, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options, Production budget process and portfolio outage statistics.
Asset management performance

Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues
None
Recommendation
None
Rating
Process/Policy rating A **Effectiveness rating** 1

Risk management	**Process/Policy rating** A	**Effectiveness rating** 2

8. Risk management

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

Observations

Policies and procedures

The risk management process is well documented with portfolio and generating station risks being identified, evaluated and handling strategies being set out. External threats are an element of the risks identified and there is evidence that risk based approaches is being used such as the Muja reinstatement of Stages A/B.

At Muja the coal is delivered from the mines by two overland conveyors through the bushland. There is a fire risk both to the bush and to the conveyors. A bushfire could damage the conveyors and interrupt supply and the coal conveyors (with a product that can spontaneously combust) may provide a hazard to the bush.
The site has been inspected for fire risks but is being surveyed for endangered and threatened flora before the bush clearing can be carried out. This is an example of the balance between risk and environment.
Significant coal stockpiles are held at both Muja and Collie PS which is sufficient for most reasonable contingency events including bush fires.

Water availability in the Collie basin is being monitored as a potential risk but mine water is adequate for current operations.

Training

There is evidence of training and awareness by staff of risk based approaches. A key strategy has been to repopulate the power stations with engineers.

Evaluation Criteria summary

- Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system

Response: There is an extensive assessment of risks at portfolio and power station and engineering level and documented in a series of risk management plans. Risks are assessed and drive maintenance in particular.

- Risks are documented in a risk register and treatment plans are actioned and monitored

Response: The risk registers are part of "the Risk Management Plan" and there are site based risk/hazard registers.

- The probability and consequences of asset failure are regularly assessed

Response: The probability and consequences of asset failure are regularly assessed through consultants RWE.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Wendy Ng, Karen Bateman and listed staff on site. Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent, Sample demolition plans, Sample tender documents, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options, Production budget process and portfolio outage statistics.

Asset management performance

Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues

There should be a close out process to ensure that notwithstanding the endangered flora there is an effective bush fire clearance at Muja.

Recommendation

The effectiveness of fire management should be monitored when the survey of endangered flora is complete at Muja. An inspection should be scheduled after bush fire clearing. (Non Mandatory recommendation – Audit guidelines 11.9).

Rating

Process/Policy rating	A	**Effectiveness rating**	2

Contingency planning	**Process/Policy rating** A	**Effectiveness rating** 1

9. Contingency planning

Contingency plans document the steps to deal with the unexpected failure of an asset.

Observations

Development of contingency plans / currency
The major risks are fuel unavailability and system emergencies (lights go out). The Licensee has a Business Continuity policy and manual and a crisis response plan.

The Licensee has good documentation of its crisis and recovery management plans.

Fuel contingencies are provided with local stockpiles of coal and fuel oil. The stockpile at Muja is large (500,000 tons) and would cover a bush fire closing the conveyor. An extensive inventory of spare parts is kept including a step up transformer which greatly reduced the impact of a transformers failure at Kwinana. The retired machines at Kwinana will provide additional spares for Kwinana stage A.

The Licensee has detailed maintenance scheduled out to 2027 with minor and major shutdowns allowed to deal with potential issues. Maintenance is partly conducted on condition based maintenance which monitors critical items for indicators of future failures. The asset management plans for each power station have detailed critiques of the units with detected issues to be managed and potential failure modes considered.

Testing of contingency plans

The 2008 gas shortage exercised the use of fuel contingencies. The Licensee tests safety systems routinely.

The Licensee conducts major incident training.

The Licensee routinely exercises system crisis responses with exercises that include third parties.

Evaluation Criteria summary

- Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks

Response: There are contingency plans for example there are Board papers giving approval to the inventory level to be maintained. Fuel diversity is a key contingency plan for either gas or coal shortage. The business continuity plans are routinely tested as has been the response to system emergency scenarios The IMO requires each unit in the portfolio to be tested to ensure that the capacity agreed can be supplied.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Wendy Ng, Karen Bateman and listed staff on site. Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent, Sample demolition plans, Sample tender documents, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options, Production budget process and portfolio outage statistics.

Asset management performance

Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues

The Varanus gas crisis illustrated the Licensees capacity to respond to unexpected problems. Classical contingency planning in power systems has a credible contingency defined, which is normally (as in the national network on Eastern seaboard) the loss of a single critical element and for generators the loss of the largest unit on line. However the loss of gas fuel is more significant than the loss of the single largest generation unit and for this Licensee was nearly a third of nameplate capacity. Other than Bluewaters 1 & 2 the Licensee has all the other coal plant in the SWIS. With the retirement of coal plant gas fuel would be more than a third of the Licensee's capacity and much more than just

over 10% that the single largest unit would be considered as a credible contingency. The Licensee has managed the contingencies within standard power system credible contingencies but the vulnerability to fuel (gas) curtailment is a system wide issue. The Licensee has identified aged and inefficient plant to be retired and has internal plans for replacement to meet the contingencies of maintaining efficient supply.
Recommendation
None
Rating
Process/Policy rating A **Effectiveness rating** 1

Financial planning	**Process/Policy rating** A	**Effectiveness rating** 1
10. Financial planning 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.		
Observations		
Financial planning process / plans The Licensee has 5 year rolling financial plans linked to the Strategic Development Plans that are required by the owner (government). *Evaluation Criteria summary* • The financial plan states the financial objectives and strategies and actions to achieve the objectives Response: There is an extensive process with Government to establish the financial plan, the financial objectives and strategise and actions to achieve the objectives. There is a state budget forecast process which the Licensee provides its budget to Government which lists operation and capital requirements and later during the year, a midyear review is undertaken with Government where major deviations can be addressed. All items have to be justified linking to required performance. There is top down process from government and a bottom up process from power stations. • The financial plan identifies the source of funds for capital expenditure and recurrent costs Response: Operational funds are sources from revenue and capital funds from Government. • The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) Response: The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets) and cash flow. • The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period Response: The financial plan provides predictions on income for the next five years and indicative predictions beyond this period.		

• The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services Response: The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services and agreed with Government. • Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary Response: Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary including but not limited to the midyear review process.

Asset management process and policy definition						
Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Wendy Ng, Konrad Lajszczak and listed staff on site.
Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options and Production budget process.

Asset management performance							
Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues

None

Recommendation

None

Rating

Process/Policy rating	A	**Effectiveness rating**	1

Capital expenditure planning	**Process/Policy rating** A	**Effectiveness rating** 1

11. Capital expenditure planning

The Licensee has 10 year capital expenditure plans as required by the owner (Government).

Observations

Capital expenditure process / plans
Funding restrictions could affect asset planning for the replacement of retired plant. Operations are not likely to be affected. (This topic is covered under asset planning and creation)

Evaluation Criteria summary

- There is a capital expenditure plan that covers issues to be addressed, actions

proposed, responsibilities and dates

Response: The expenditure that is required to maintain plant to the manufacturer's requirements or scheduled servicing and approved projects budgeted. There is a provision for emergent issues.

- The plan provide reasons for capital expenditure and timing of expenditure

Response: Capital expenditure is scheduled according to the service frequency (blade replacement etc) as required by the manufacturer, consultants such as RWE and consequences of faults and assessed performance needs. Capital plan is as agreed with Government.

- The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan

Response: Capital expenditure plan is consistent with the asset life and condition and included in agreed plans with Government.

- There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned

Response: The capital expenditure plan is regularly updated and actioned through the midyear review process.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Wendy Ng, Konrad Lajszczak and listed staff on site.
Documents: Include Corporate strategic plan, Risk management plan, Statement of Corporate Intent, Financial statements, Budget papers, RWE consultant's options paper, Long term Strategic guideline discussion paper on plant reinvestment options and Production budget process.

Asset management performance

Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues

None.

Recommendation

None

Rating

Process/Policy rating	A	**Effectiveness rating**	1

Review of AMS	**Process/Policy rating** A	**Effectiveness rating** 2

12. Review of AMS

The asset management system is regularly reviewed and updated.

Observations

The AMS is complex and as a generator the service delivery is heavily asset based. The individual power station/ plant plans are scheduled for at least annual reviews but the strategic plans while not needing as frequent reviews do need to encompass changing environments such as the current state of the Western Australian electricity market.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Asset management performance

Process	☑	Documentation	☒	Availability	☑	Use	☑

Issues

The Licensee is obliged to make annual strategic plans to its owner and these should in turn trigger reviews of asset strategies. However more formal processes to trigger reviews of the AMS should be put in place rather than rely on implied causes to bring about change.

Evaluation Criteria summary

- 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 is triggered by the annual review process with Government which in turn triggers the annual strategic planning process.

- Independent reviews (e.g. internal audit) are performed of the asset management system

Response: The Licensee has engaged consultants RWE to review the plant on a 2 yearly basis. This process is governed by an Executive committee that routinely monitors progress on significant commitments.

Recommendation

None.

Rating

Process/Policy rating	A	**Effectiveness rating**	2