McGill Engineering Services Pty Ltd

Engineering, Adjudication & Arbitration Services ABN 45 106 691 169

Electricity Generation performance audit report

&

Asset management system review

Verve Energy EGL 7

Prepared By Kevan McGill
Date 25 September 2008

Mr Andrew Everett
Manager Strategy and Regulation
Verve Energy
Australia Place
William Street
PERTH WA 6000

Dear Mr Everett

Performance Audit & Asset Management System Review Generation Licences EGL 7

The fieldwork on the performance audit and asset management system review of Generation Licence EGL 7 for the audit period 30 March 2006 to 31 March 2008 is complete and I am pleased to submit the report to you.

In my opinion, the licensee maintained, in all material aspects, effective control procedures in relation to the Generation Licence (EGL 7) for the audit period based on the relevant clauses referred to within the scope section of this report.

Yours sincerely

Kevan McGill
Director

25 September 2008

Contents

Executive Summary

This performance audit and asset management review was conducted in accordance with the guidelines issued by the Economic Regulation Authority (*Authority)* for the audit period (30 March 2006 to 31 March 2008).

Overall conclusion

In my opinion, the licensee maintained, in all material aspects, effective control procedures in relation to the Generation Licence (EGL 7) for the audit period based on the relevant clauses referred to within the scope section (page 7) of this report.

Performance audit

A summary of the findings of the performance audit is:

Operational/performance compliance rating scale

Compliance status	Rating	Description of compliance
COMPLIANT	5	Compliant with no further action required to maintain compliance
COMPLIANT	4	Compliant apart from minor or immaterial recommendations to improve the strength internal controls to maintain compliance
COMPLIANT	3	Compliant with major or material recommendations to improve the strength of internal controls to maintain compliance
NON-COMPLIANT	2	Does not meet minimum requirements
SIGNIFICANTLY NON-COMPLIANT	1	Significant weaknesses and/or serious action required

The results are summarised below.

Assessment	Licence obligations	Audit priority 4	Audit priority 5
Compliant 5	26	16	10
Compliant 4			
Compliant 3			
Non-compliant 2			
Significantly non compliant 1			
Not rated*	20	14	6

* Note Where an obligation was not exercised in the audit period, it was not possible to form an opinion about compliance and the item was not rated.

Asset Management Review

The findings of the asset management review are summarized as;

Ratings

The asset management review report provides a table that summarises the auditor's assessment of the effectiveness ratings for each key process in the licensee's asset management system using the 6-point scale described below.

Asset management review effectiveness rating scale

Effectiveness	Rating	Description
Continuously improving	5	Continuously improving organisation capability and process effectiveness
Quantitatively controlled	4	Measurable performance goals established and monitored
Well-defined	3	Standard processes documented, performed and coordinated
Planned and tracked	2	Performance is planned, supervised, verified and tracked
Performed informally	1	Base practices are performed
Not performed	0	Not performed (indicate if not applicable)

Findings

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

Asset management effectiveness summary

ASSET MANAGEMENT SYSTEM	Not performed	Performed informally	Planned and tracked	Well defined	Quantitatively controlled	Continuously improving
Process Effectiveness rating	0	1	2	3	4	5
Asset planning						
Asset creation/ acquisition						
Asset disposal						
Environmental analysis						
Asset operations						
Asset maintenance						
Asset Management Information System						
Risk management						
Contingency planning						
Financial planning						
Capital expenditure planning						
Review of AMS						

Performance Audit and Asset Management Review

Performance Audit Objectives

Under section 13 of the *Electricity Industry Act 2004* (the Act), it is a requirement that every licensee provide the Economic Regulation Authority (*Authority*) not less than once in every period of 2 years with a performance audit conducted by an independent expert acceptable to the *Authority*.

The primary objective of the operational audit is to audit the effectiveness of measures taken by the Licensee to maintain quality and performance standards. The Act states a performance audit is an audit of the effectiveness of measures taken by the licensee to meet the performance criteria specified in the licence. The licence states that performance standards are contained in *applicable legislation*. Performance criteria are defined in the licence as*:*

(a) the terms and conditions of the *licence*; and

(b) any other relevant matter in connection with the *applicable legislation* that the *Authority* determines should form part of the *performance audit*.

The licence also provides for individual licence conditions namely - the *Authority* may prescribe *individual performance standards* in relation to the *licensee* of its obligations under this *licence* or the *applicable legislation* (the Act and subordinate legislation). There are no individual performance standards in evidence in the audit period.

The *Authority* has summarised the performance requirements in various legislation in its Electricity compliance reporting manual (March 2008)[1].

Asset Management System Review Objectives

Under the *Electricity Industry Act 2004* (the Act) section 14, the 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 Economic Regulation Authority - *Authority).*

An asset management system is to set out the measures to be taken by the licensee for the proper maintenance of assets used in the generation of electricity and in the operation and maintenance of, and, where relevant, the construction or alteration of, the generator's assets.

McGill Engineering Services Pty Ltd has been engaged to carry out the performance audit and asset management system review for Electricity Generation Licence EGL 7 for Verve Energy (Electricity Generation Corporation).

Audit period

The performance audit and asset management system review audit period is from 30 March 2006 to 31 March 2008.

[1] Electricity compliance reporting manual, March 2008

Performance Audit

Scope Limitation

The review was undertaken by examination of documents, interviews with key persons and observations and was not be a detailed inspection of physical items. As there are no individual performance standards applied by the *Authority,* that area has been deleted from the audit.

Inherent Limitations

Because of the inherent limitations of any internal control structure, it is possible that fraud, error or non-compliance with laws and regulations may occur and not be detected.

An audit is not designed to detect all weaknesses in compliance measures as an audit is not performed continuously throughout the period and the audit procedures performed on the compliance measures are undertaken on a test basis.

Any projection of the evaluation of the operating licences to future periods is subject to the risk that the compliance measures in the plans may become inadequate because of changes in conditions or circumstances, or that the degree of compliance with them may deteriorate.

The audit opinion expressed in this report has been formed on the above basis.

Scope of the audit/review

The *Authority* guideline[2] for performance audits sets out that the audit should be conducted in 3 phases.

1. Risk and materiality assessment

With reference to AS/NZS4360 Risk Management a preliminary assessment was made of the risk and materiality of non-compliance with the required licence conditions in order to focus the audit effort on areas of higher compliance risk and identify areas for testing and analysis.

2. System analysis, assertion setting and review

Through discussion, observation and review, a sample of cases or data was analysed relating to the licensee's quality and performance systems and standards against requirements of the Licence conditions to be audited.

3. Fieldwork: testing and analysis

Using the results of the risk assessment and systems analysis, detailed testing and analysis will be performed to compare those standards maintained by the licensee with the relevant clauses of the Licence. During this audit the Perth and Kewdale offices, and Kwinana, Cockburn, Muja and Collie licence operating area were visited.

. There are no actions taken in response to recommendations in previous audit/reviews to follow up as this is the first audit.

[2] Audit Guidelines: Electricity, Gas and Water Licences, September 2006

The audit provides a full and comprehensive report to the licensee and the *Authority* that clearly expresses the opinion of the auditor in respect of the findings of the audit/review.

The key contacts were:

- Licensee
  - Andrew Everett
- McGill Engineering Services Pty Ltd
  - Kevan McGill, John McLoughlin

The audit/review was conducted during July and August 2008 with the final audit report to be submitted to the Authority by 30 September 2008.

Audit requirements

Compliance with licence conditions is to be examined according to the likely inherent risk and the adequacy of controls to manage that risk.

Nature of audit work conducted

The *Authority* guidelines for performance audits require that the audit considers:

a) **Process compliance** - the effectiveness of systems and procedures in place throughout the audit period, including the adequacy of internal controls.

b) **Outcome compliance** – the actual performance against standards prescribed in the licence throughout the audit period.

c) **Output compliance** – the existence of the output from systems and procedures throughout the audit period (that is, proper records exist to provide assurance that procedures are being consistently followed and controls are being maintained).

d) **Integrity of performance reporting** – the completeness and accuracy of the performance reporting to the Authority.

e) **Compliance with any individual licence conditions -** the requirements imposed on the specific licensee by the Authority or specific issues for follow-up that are advised by the Authority.

Stage	Auditor	Standard
1. Risk & Materiality Assessment Outcome - Operational/ Performance Audit Plan	K McGill	ASA 300 (replaces AUS 302): Planning ASA 315 (replaces AUS 402): 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	K McGill John McLoughlin	AUS 502: Audit Evidence AUS 806: Performance Auditing

procedures • Compliance attitude		
4. Reporting	K McGill	ASA 300 (replaces AUS 302): Planning AUS 806: Performance Auditing

Overall conclusion

In my opinion, the licensee maintained, in all material aspects, effective control procedures in relation to the Generation Licence (EGL 7) for the audit period based on the relevant clauses referred to within the scope section (page 7) of this report.

Findings

The conclusions of each of the elements of the licence are summarised in the following table. The audit risk as determined for each licence condition is also shown. The detail; of the audit can be seen in Appendix I (Page 19).

Item	Reporting manual number	Licence obligation	Audit risk assessment	Compliance Rating	
Licence obligation Type 2					
5.1[3]	87	Pay for interest in land	4	Not rated	
12.2	103	Amend AMS[4] on expansion	4	Compliant	5
12.3	104	Expansion outside licence area	4	Compliant	5
13.1	105	Accounting standards	4	Compliant	5
14.4	106	Individual performance standards	n/a		
15.2	107	Audit guidelines	4	Compliant	5
16.1/ 16.2	83	AMS	4	Compliant	5
16.4	108	AMS Audit Guidelines	4	Compliant	5
17.1	109	External Administration	4	Compliant	5
18.1	110	Information provision	4	Compliant	5
19.2	111	Publish information	4	Not rated	
20.1	112	Notices	4	Not rated	
Licence obligations Type NR					
4.1	85	Licence fees	5	Compliant	5
5.1	86	Minimise disruption	5	Compliant	5
15.1	81	Performance audit	5	Compliant	5

[3] Licence clause number

[4] Asset Management System

16.1	82	AMS	5	Compliant	5
16.3	84	AMS Review	5	Compliant	5
Metering Code Type 2					
3.27[5]	342/390[6]	Registered installer	4	Compliant	5
3.5.6	309	Metering installation charges	n/a		5
3.11.3	319	Metering installation outage	4	Not rated	
3.16(5)	331	Metering Service level agreement	4	Not rated	
4.5(2)	351/399	Notify of inaccuracy	4	Not rated	
5.5(3)	365/413	No charge for data	4	Not rated	
5.16	376/424	Provide Network operator with data	4	Compliant	5
5.17(1)	377/425	Provide standing and validated energy data to customer	4	Compliant	5
5.18	378/426	Change of energisation status	4	Not rated	
5.19(3)	381/429	Notify change of attributes	4	Not rated	
5.19(4)	382/430	Notify of sensitive load	4	Not rated	
5.21(5)	390/438	Test conditions	4	Not rated	
5.21(6)	391/439	Test consistent with access arrangement	4	Not rated	
5.27	409/457	Missing customer attribute information	4	Not rated	
6.1(2)	416/464	Comply with access contract	4	Compliant	5
7.2(4)	420/468	New contact details to network operator	4	Compliant	5
7.2(5)	421/469	Change in contact details to network operator	4	Compliant	5
7.5	422/470	Confidentiality of information	4	Compliant	5
7.6(1)	423/471	Disclosure of permitted confidential information	4	Compliant	5
8.1(4)	427/475	Dispute procedures	4	Not rated	
Metering Code Type NR					
4.4(1)	349/397	Liaise to resolve discrepancies in energy data	5	Compliant	5
4.5(1)	350/398	Registry accuracy	5	Compliant	5
5.4(2)	363/411	Provide assistance to network operator	5	Not rated	
5.19(1)	379/427	Collect customer information	5	Compliant	5
5.19(2)	380/430	Customer attributes for	5	Compliant	5

[5] Metering Code clause number

[6] 2008 Reporting manual /2007 Reporting manual

		connection point			
5.19(6)	384/432	Change in customer attributes for connection point	5	Not rated	
7.2(1)	418/466	Capacity to receive notices form Network operator	5	Compliant	5
8.1(1)	424/472	Dispute procedures	5	Not rated	
8.1(2)	425/473	Dispute procedures	5	Not rated	
8.1(3)	426/474	Dispute procedures	5	Not rated	
8.3(2)	428/476	Dispute resolution	5	Not rated	

Audit Results and Recommendations

Summary of significant results

Item	Licence obligation
12.2	*Electricity Industry Act section 11*. A licensee must amend the asset management system before an expansion or reduction in generating works, distribution systems and transmission systems and notify the *Authority* in the manner prescribed, if the expansion or reduction is not provided for in the asset management system.
	Issue 1
	The Rockingham PV system was devolved to Murdoch University. The Rockingham PV system is very small (20kW) and below the Exemption Order and therefore does not require Murdoch University to obtain a licence. The devolution has been foreshadowed to the *Authority* and included in the asset management system and meets the requirements. However the map is still on the licence and could be removed. A Licensee can have a licence area and not operate but cannot operate outside a licence area.
	Recommendation 1
	The Licensee to advise the *Authority* on the removal of the map for Rockingham PV system.
	Issue 2
	Wellington Dam Hydro is inoperative but retirement is expected in the next review period.
	Recommendation 2
	The Licensee is to develop asset disposal plans and advise the *Authority* when Wellington Dam Hydro is retired.

Post Audit implementation Plan

Item	Action	Recommendation	Responsible	When
12.2	Amend AMS on expansion or reduction	The Licensee to advise the *Authority* on the removal of the map for Rockingham PV system.	Chief Operating Officer	October 2008

12.2	Amend AMS on expansion or reduction	The Licensee is to develop asset disposal plans and advise the *Authority* when Wellington Dam Hydro is retired.	Chief Operating Officer	July 2009

Asset Management System Review

The recommendations identify:

a) The asset management process.

b) The effectiveness rating.

c) The issue(s) identified that have resulted in the nominated effectiveness rating.

d) The recommended action(s) to improve the effectiveness of the asset management process to an acceptable level.

Overall conclusion

In my opinion, the licensee maintained, in all material aspects, an adequate and effective asset management system in relation to the Generation Licence (EGL 7) for the audit period based on the relevant clauses referred to within the scope section (Page 7) of this report.

Audit priority

The *Authority* guidelines for asset management system reviews sets out a rating for audit priority based on inherent risk and existing controls. The following priorities were determined in accordance with the guidelines and audit plan and accepted by the Licensee.

This gives the review priorities and resulting ratings being as follows.

Item	Licence obligation	Inherent Risk	Controls risk requirement	Review priority	Rating 0 1 2 3 4 5
1	Asset planning	High	Strong	2	
2	Asset creation/ acquisition	High	Strong	2	
3	Asset disposal	Medium	Moderate	4	
4	Environmental analysis	Medium	Moderate	4	
5	Asset operations	High	Strong	2	
6	Asset maintenance	High	Strong	2	
7	Asset Management Information System	High	Strong	2	
8	Risk management	Medium	Moderate	4	
9	Contingency planning	Medium	Moderate	4	
10	Financial planning	Medium	Moderate	4	
11	Capital expenditure planning	Medium	Moderate	4	
12	Review of AMS	Medium	Moderate	4	

Use of Audit Processes and Practices

1 Accepted audit processes and practices were used to complete the review. These include the sampling techniques associated with process reviews such as interviews to define accountability, observations, document sighting and testing of users.

2 The review addressed four key elements of successful delivery of asset management to allow the assessment of the effectiveness of the asset management system. These elements are:

- Process – the existence of a suitable process for activities
- Documentation – the existence of a document defining a process
- Availability/accessibility/understanding – the process is understood, available to those required to use it and accessible to them
- Use- confirmation the process is used consistently

3 The audit priorities were determined and include in the asset management system review plan approved by the *Authority*.

The review was conducted by Kevan McGill and John McLoughlin during July and August 2008.

Review Results and Recommendations

The following summarises the key results and recommendations, the complete results are in Appendix II (Page 39).

Asset Management Item	**Recommendation**
Asset planning	**Issue 1**
	The asset mission report is linked to the Licensee's strategic plan and while the Licensee has acted responsively to the changed environment it is not clear that a strategic process triggering such a review exists. The process could be more formalised.
	Recommendation 1
	Consideration is given to a visible scheduled review process of the asset mission report.
	Issue 2
	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. The asset mission statement indicates that 100 MW would be replaced by 2009 and another 200 MW by 2011 which would give about the 3000 MW Ministerially applied limit. Given the long procurement of generation plant this is a significant issue for the Licensee's generation capacity. 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. Whether this is adequate for system capacity (system security) is an issue for the IMO (Independent Market Operator). The asset management issue is that if the licensee wishes to maintain its portfolio

	objectives there are emerging time constraints between retirement of existing plant and possible replacements. 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 an issue for the Licensee but the IMO as a system security matter. The retirement timeframe is more aggressive than a likely replacement timing which would give the Licensee a shortfall in its portfolio generation capacity.
	Recommendation 2
	To maintain portfolio capacity at 3000 MW, the Licensee should examine strategies for expediting portfolio replacement given the long lead time for replacement.
Asset disposal	**Issue 1**
	The Licensee has a number of generation units that are scheduled for retirement or were retired only to be put back into in service following the recent 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.
	Recommendation 1
	The post retirement plans need to be advanced particularly for Kwinana stage B.
Asset operations	**Issue 1**
	Muja has been using a relatively small (3% of wood to coal input to burner) amount of wood residue from a timber mill that was constructed on the site for the purpose of obtaining steam in exchange for biomass fuel. There has been an incident in a grinding mill related to this renewable source and biomass co-firing is currently suspended. Investigations are underway but this is a serious safety issue and must be fully resolved before further action is taken with this biomass material at Muja. An independent expert review of the report and the suitability of the boilers to burn this fuel are considered to be essential.
	Recommendation 1
	Investigations, with appropriate independent expert input, into the safety issues at Muja about burning wood in a coal plant is completed before any further action with this material is considered at Muja.
Asset maintenance	**Issue 1**
	The gas turbines section does not use the comprehensive Ellipse maintenance IT system (used by the large power stations) for maintenance scheduling for gas turbines) as it is regarded as too sophisticated for their scale of operations. Currently maintenance history of gas turbines is recorded in Ellipse.
	Recommendation 1
	Consideration is given to gas turbines and renewable systems extending the use of Ellipse for maintenance scheduling for gas turbines for portfolio wide consistency.

Risk management	**Issue 1**
	While there are bushfire response measures and vegetation management processes in place at Muja, there should be an inspection process to ensure that the fire risks are managed.
	Recommendation 1
	An inspection system is put in place to ensure bush fire mitigation is effective, particularly at Muja.
AMS review	**Issue 1**
	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.
	Recommendation 1
	A process be implemented that schedules regular review of the asset management system.

Post Audit implementation Plan

AMS item	Recommendation	Responsible	When
Asset planning	Consideration is given to visible triggers for a review of the asset mission report.	Chief Operating Officer	October 2008
	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
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
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	December 2008
Risk management	An inspection system is put in place to ensure bush fire mitigation is effective, particularly at Muja.	Chief Operating Officer	October 2008
AMS review	A process be implemented that schedules regular review of the asset management system.	Chief Operating Officer	December 2008

Audit Evidence

The following evidence was gathered for the audits and asset management system review.

1. Legislation and standards
    - *Electricity Industry Act 2004*
    - Auditing and Assurance handbook
    - Electricity Generating Licence EGL 7

2. Licensee's documents

- Kwinana Power station
    a. Asset management plan
    b. Emergency response manual
    c. Water usage spreadsheet
    d. Index to detailed operating instructions
- Collie power station
    a. Asset management plan
    b. Detailed criticality and risk management sheets
    c. O & M agreement
- Muja power station
    a. Asset management plan
    b. Emergency response guidelines
- Cockburn power station
    a. Asset management plan
- Gas Turbines & sustainable equipment
    a. Asset management plan
    b. GT Hot Gas Path Component History
    c. Regional Monthly Inspections
    d. Pinjar Preventative Maintenance Checklist 2008
    e. Power station operations - general requirements
    f. Hopetoun wind diesel description
    g. Hopetoun wind diesel maintenance and operations plan
    h. Asset management plan regional gas turbines Pinjar, Mungarra and Geraldton
    i. Pinjar and Kalgoorlie distillate storage spreadsheet
    j. Index to detailed operating instructions
    k. Index to governance details
    l. Index to detailed maintenance instructions

m. Index to permit to work instructions
n. Equipment lists and work orders

- Portfolio asset mission report
- Maintenance process diagram
- Crisis management and recovery manual
- Risk management framework
- Environment audit processes
- Overhaul schedule spreadsheet
- Master project spreadsheet
- Plant change manual
- Operating and governance details index
- Annual reports
- Annual information returns
- Licence fee invoices/receipts
- Generation licence application
- Meter details
- Strategic development plan
- Statement of corporate intent

Audit Time

The audits and asset management review were undertaken by Kevan McGill and John McLoughlin and took approximately 140 hours aggregate for the 2 reviews.

Appendix 1 Performance audit detail results and recommendations

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Act section 41(6) A licensee must pay the costs of taking an interest in land or an easement over land.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☐

As no interest in land or easement over land has occurred in the audit period, no cost payments arose and compliance or otherwise could not be assessed. As there has been no activity, performance could not be rated.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 12.2	Compliance rating Compliant - 5
Electricity Industry Act section 11. A licensee must amend the asset management system before an expansion or reduction in generating works, distribution systems and transmission systems and notify the *Authority* in the manner prescribed, if the expansion or reduction is not provided for in the asset management system.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

The Kalbarri wind farm addition occurred in the audit period and modification was required. ERA was advised of the addition to the asset base. The Rockingham PV system was devolved to Murdoch University. Wellington Dam Hydro is inoperative.
Issues
The Rockingham PV system is very small (20kW) and below the Exemption Order and therefore does not require Murdoch University to obtain a licence. The devolution has been foreshadowed to the *Authority* and included in the asset management system and meets the requirements. However the map is still on the licence and could be removed. A Licensee can have a licence area and not operate but cannot operate outside a licence area. Wellington Dam Hydro is inoperative but retirement is expected in the next review period.
Recommendations
The Licensee to advise the *Authority* on the removal of the map for Rockingham PV

system. The Licensee is to develop asset disposal plans and advise the *Authority* when Wellington Dam Hydro is disposed.
Management Actions
Will advise the *Authority* on the Rockingham map. Disposal plans will be developed and the *Authority* will be advised when Wellington Dam Hydro is disposed.

Licence obligation 12.3								Compliance rating Compliant - 5	
Electricity Industry Act section 11. A licensee must not expand the generating works, distribution systems or transmission systems outside the licence area.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The Kalbarri wind farm addition occurred in the audit period and modification was required. The *Authority* was advised of the addition to the asset base. Kalbarri was added to the licence area so no expansion occurred outside the licence area.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 13.1								Compliance rating Compliant - 5	
Electricity Industry Act section 11. A licensee and any related body corporate must maintain accounting records that comply with the Australian Accounting Standards Board Standards or equivalent International Accounting Standards.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The licensee's annual report has the auditor's declaration that they comply with Australian accounting standards.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 14.4								Compliance rating Not applicable	
Electricity Industry Act section 11. A licensee must comply with any individual performance standards prescribed by the Authority.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☐
No individual reporting standards have been prescribed. This item was deleted from the audit									

Licence obligation 15.2								Compliance rating Compliant - 5	
Electricity Industry Act section 11. A licensee must comply, and require its auditor to comply, with the *Authority's* standard audit guidelines dealing with the performance audit.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
This audit is in accordance with the *Authority's* guidelines.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 16.1& 16.2								Compliance rating Compliant - 5	
Electricity Industry Act section 14(1)(b) A licensee must notify details of the asset management system and any substantial changes to it to the Authority.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The licensee provided details when the licence was issued. Kalbarri wind farm has been added to the portfolio in the audit period and ERA was advised. The Rockingham PV system was deleted but this was included in the asset plans. All the power stations have asset management plans that are updated annually. These are not changes in platform or in strategic direction but detailed outage and maintenance schedules with the relevant work orders and not notifiable to the ERA.									
Issues									
None									
Recommendations									
None									

Management Actions
Not applicable

Licence obligation 16.4								Compliance rating Compliant - 5	
Electricity Industry Act section 11. A licensee must comply, and must require the licensee's expert to comply, with the relevant aspects of the Authority's standard guidelines dealing with the asset management system.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
This asset management system review complies with the *Authority's* guidelines.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 17.1								Compliance rating Compliant - 5	
Electricity Industry Act section 11. A licensee must report to the Authority, in the manner prescribed, if a licensee is under external administration or there is a significant change in the circumstances upon which the licence was granted which may affect a licensee's ability to meet its obligations.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The licensee is not under external administration nor has there been a significant change in the circumstances on which the licence was granted and therefore no need to advise the *Authority.*									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 18.1	Compliance rating Compliant - 5
Electricity Industry Act section 11. A licensee must provide the Authority, in the manner prescribed, any information the Authority requires in connection with its functions under the Electricity Industry Act.	

Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The licensee has provided the information in the manner prescribed to the *Authority.*									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 19.2	Compliance rating Not rated
Electricity Industry Act section 11. A licensee must publish any information it is directed by the Authority to publish, within the timeframes specified.	

Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The *Authority* did not direct any information to be published. As there has been no activity, performance could not be rated.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 20.1	Compliance rating Not rated
Electricity Industry Act section 11. Unless otherwise specified, all notices must be in writing.	

Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
No notices were issued and accordingly it could not be observed if notices were in writing.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1	Compliance rating Not Applicable
Electricity Industry Metering Code clause 3.5(6) The requirement is that a network operator may only impose a charge for providing, installing, operating or maintaining a metering installation in accordance with the applicable service level agreement between it and the user.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☐

This requirement is listed in the Reporting Manual but is an obligation on the network operator and not the licensee.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 3.11(3) The requirement is that a Code participant who becomes aware of an outage or malfunction of a metering installation must advise the network operator as soon as practicable.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

No meter outages or malfunctions have occurred in the audit period. As there has been no activity, performance could not be rated.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 3.16(5) The requirement is that a network operator or a user may require the other to negotiate and enter into a written service level agreement in respect of the matters in the metrology procedure dealt with under clause 3.16(4) of the Code.	

Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
This requirement relates to the conversion of non interval metering to interval metering. All the meters are interval meters (half hour meters) so there is no need for conversion. As there has been no activity, performance could not be rated.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Metering Code clause 3.27 A person must not install a metering installation on a network unless the person is the network operator or a registered metering installation provider for the network operator doing the type of work authorised by its registration.	

Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The meters were installed by Western Power – the network operator.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 4.5(2) If a Code participant (other than a network operator) becomes aware of a change to or an inaccuracy in an item of standing data in the registry, then it must notify the network operator and provide details of the change or inaccuracy within the timeframes prescribed.	

Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The licensee is a Code participant but no issues about standing data have arisen. As there has been no activity, performance could not be rated.									
Issues									
None									

Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 5.5(3). A user must not impose any charge for the provision of the data under this Code unless it is permitted to do so under another enactment.	

Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
No data has been provided therefore no charges have been made. As there has been no activity, performance could not be rated.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Metering Code clause 5.16. A user that collects or receives energy data from a metering installation must provide the network operator with the energy data (in accordance with the communication rules) within the timeframes prescribed.	

Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The network operator (Western Power) reads the meters and therefore collects the energy data and not the licensee. Some meters were read manually at Muja for a period but no issues about provision of data arose. These meters have now been converted to remote reading by the network operator. The meters for renewable and remote sites are read by the network operator Western Power or Horizon Power (Western Power).									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Metering Code clause 5.17(1). A user must provide standing data and validated (and where necessary substituted or estimated) energy data to the user's customer, to which that information relates, where the user is required by an enactment or an agreement to do so for billing purposes or for the purpose of providing metering services to the customer.	

Observations

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

No metering complaints have been received by the Licensee.

Issues

None

Recommendations

None

Management Actions

Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 5.18. A user that collects or receives information regarding a change in the energisation status of a metering point must provide the network operator with the prescribed information, including the stated attributes, within the timeframes prescribed.	

Observations

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There has been no change to the energisation state of the meters. As there has been no activity, performance could not be rated.

Issues

None

Recommendations

None

Management Actions

Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 5.19(3). A user must, after becoming aware of any change in a site's prescribed attributes, notify the network operator of the change within the timeframes prescribed.	

Observations

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There has been no change in the sites prescribed attributes. As there has been no activity, performance could not be rated.

Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1								Compliance rating Not rated	
Electricity Industry Metering Code clause 5.19(4). A user that becomes aware that there is a sensitive load at a customer's site must immediately notify the network operator's Network Operations Control Centre of the fact.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
There are no sensitive loads. As there has been no activity, performance could not be rated.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1								Compliance rating Not rated	
Electricity Industry Metering Code clause 5.21(5). A Code participant must not request a meter test or audit unless the Code participant is a user and the test or audit relates to a time or times at which the user was the current user or the Code participant is the IMO.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
There have been no meter tests or audits. As there has been no activity, performance could not be rated.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 5.21(6). A Code participant must not make a test or audit request that is inconsistent with any access arrangement or agreement.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There have been no meter tests or audits. As there has been no activity, performance could not be rated.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 5.27. Upon request, a current user must provide the network operator with customer attribute information that it reasonably believes are missing or incorrect within the timeframes prescribed.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There has been no missing or incorrect customer attributes. As there has been no activity, performance could not be rated.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Metering Code clause 6.1(2). A user must in relation to a network on which it has an access contract, comply with the rules, procedures, agreements and criteria prescribed.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

Western Power, the network operator, provides the metering services. Horizon Power uses Western Power for the sites where Horizon Power is the network operator.

Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1								Compliance rating Compliant - 5	
Electricity Industry Metering Code clause 7.2(4) A Code participant must notify its contact details to a network operator with whom it has entered into an access contract within 3 business days after the network operator's request.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
There have been no requests for contact details from the network operator. This has been confirmed with the System Operator (Western Power).									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1								Compliance rating Compliant - 5	
Electricity Industry Metering Code clause 7.2(5) A Code participant must notify any affected network operator of any change to the contact details it notified to the network operator at least 3 business days before the change takes effect									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
There has been no change in contact details. This has been confirmed with the System Operator (Western Power).									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Metering Code clause 7.5 A Code participant must not disclose, or permit the disclosure of, confidential information provided to it under or in connection with the Code and may only use or reproduce confidential information for the purpose for which it was disclosed or another purpose contemplated by the Code.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

No complaints have risen about disclosure of confidential information.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Metering Code clause 7.6(1) A Code participant must disclose or permit the disclosure of confidential information that is required to be disclosed by the Code.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

No information has been required to be disclosed.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 8.1(4) If the dispute is resolved by representative negotiations, senior management negotiations or CEO negotiations, the disputing parties must prepare a written and signed record of the resolution and adhere to the resolution.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There have been no metering disputes. As there has been no activity, performance could not be rated.

Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 15.1								Compliance rating Compliant - 5	
Electricity Industry Act section 13(1) A licensee must, not less than once every 24 months, provide the Authority with a performance audit conducted by an independent expert acceptable to the Authority.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
This audit satisfies the requirement.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 16.1								Compliance rating Compliant - 5	
Electricity Industry Act section 14(1)(a) A licensee must provide for an asset management system.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
This review will examine the asset management system.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 16.3	Compliance rating Compliant - 5
Electricity Industry Act section 14(1)(c) A licensee must provide the Authority with a report by an independent expert as to the effectiveness of its asset management system every 24 months, or such longer period as	

determined by the Authority.
Observations

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

This review satisfies the requirement.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 4.1	Compliance rating Compliant - 5
Electricity Industry Act section 17(1) A licensee must pay to the Authority the prescribed licence fee within one month after the day of grant or renewal of the licence and within one month after each anniversary of that day during the term of the licence.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

The fees have been paid and on time. Copies of invoices/receipts have been provided.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Act section 31(3) A licensee must take reasonable steps to minimise the extent or duration of any interruption, suspension or restriction of the supply of electricity due to an accident, emergency, potential danger or other unavoidable cause.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

A degree of unplanned outages is expected– FOF (Forced outage factor) and is estimated in advance. The reserve capacity refund mechanism is an incentive to expedite return to service. The Licensee works diligently to minimise the duration of outages.
Issues
None

Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Metering Code clause 4.4(1) A network operator and affected Code participants must liaise together to determine the most appropriate way to resolve a discrepancy between energy data held in a metering installation and data held in the metering database.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There have been no discrepancies in energy data which is read by the network operator anyway.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Metering Code clause 4.5(1) A Code participant must not knowingly permit the registry to be materially inaccurate.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There have been no inaccuracies in the registry which is held by the network operator anyway.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Compliant - 5
Electricity Industry Metering Code clause 5.4(2) A user must, when reasonably requested by a network operator, use reasonable endeavours to assist the network operator to comply with the network operator's	

obligation. Meters have to be read at least once per year and if not, has assistance has to be provided to the network operator to read the meter.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The network operator (Western Power) reads the meters monthly and no assistance has been required by the licensee. The meters at Muja before conversion to automated reading were read at least weekly.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1								Compliance rating Compliant - 5	
Electricity Industry Metering Code clause 5.19(1) A user must, when requested by the network operator acting in accordance with good electricity industry practice, use reasonable endeavours to collect information from customers, if any, that assists the network operator in meeting its obligations described in the Code and elsewhere									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
There have been no complaints about the collection of customer information.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1								Compliance rating Compliant - 5	
Electricity Industry Metering Code clause 5.19(2) A user must, to the extent that it is able, collect and maintain a record of the address, site and customer attributes, prescribed in relation to the site of each connection point, with which the user is associated.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The site and customer (metering) attributes have not changed. The attributes of the 16 meters installed in March 2008 are recorded and agreed with the Network operator.									

Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1								Compliance rating Not rated	
Electricity Industry Metering Code clause 5.19(6) A user must use reasonable endeavours to ensure that it does notify the network operator of a change in an attribute that results from the provision of standing data by the network operator to the user.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
There have been no changes in (metering) attributes. As there has been no activity, performance could not be rated.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1								Compliance rating Compliant - 5	
Electricity Industry Metering Code clause 7.2(1) Code participants must use reasonable endeavours to ensure that they can send and receive a notice by post, facsimile and electronic communication and must notify the network operator of a telephone number for voice communication in connection with the Code.									
Observations									
Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑
The network operator has the current contact details. This has been verified with system management.									
Issues									
None									
Recommendations									
None									
Management Actions									
Not applicable									

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 8.1(1) Representatives of disputing parties must meet within 5 business days after a notice given by a disputing party to the other disputing parties and attempt to resolve the dispute under or in connection with the Electricity Industry Metering Code by negotiations in good faith.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There have been no metering disputes. As there has been no activity, performance could not be rated.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 8.1(2) If a dispute is not resolved within 10 business days after the dispute is referred to representative negotiations, the disputing parties must refer the dispute to a senior management officer of each disputing party who must meet and attempt to resolve the dispute by negotiations in good faith.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There have been no metering disputes. As there has been no activity, performance could not be rated.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 8.1(3) If the dispute is not resolved within 10 business days after the dispute is referred to senior management negotiations, the disputing parties must refer the dispute to the senior executive officer of each disputing party who must meet and attempt to resolve	

the dispute by negotiations in good faith.
Observations

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There have been no metering disputes. As there has been no activity, performance could not be rated.
Issues
None
Recommendations
None
Management Actions
Not applicable

Licence obligation 5.1	Compliance rating Not rated
Electricity Industry Metering Code clause 8.3(2) The disputing parties must at all times conduct themselves in a manner which is directed towards achieving the objective of dispute resolution with as little formality and technicality and with as much expedition as the requirements of Part 8 of the Code and a proper hearing and determination of the dispute, permit.	
Observations	

Process	☑	Outcome	☑	Output	☑	Reporting	☑	Compliance	☑

There have been no metering disputes. As there has been no activity, performance could not be rated.
Issues
None
Recommendations
None
Management Actions
Not applicable

Appendix II Asset management system review results and recommendations

Asset Planning	Effectiveness rating Quantitatively Controlled - 4

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

Process	☑	Documentation	☑	Availability	☑	Use	☑

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.

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.

Due to the changed operating environment (due to the recent gas shortage) the Licensee has recently conducted a new portfolio asset mission report, the output of which is not yet available.

The small systems have a similar asset mission report which is appropriate for smaller systems.

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. The asset mission statement indicates that 100 MW would be replaced by 2009 and another 200 MW by 2011 which would give about the 3000 MW Ministerially applied limit. Given the long procurement of generation plant this is a significant issue for the Licensee's capacity.

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. The retirement timeframe is more aggressive than a likely replacement timing which would give the Licensee a shortfall in its portfolio generation capacity. 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. Whether this is adequate for system capacity (system security) is an issue for the IMO (Independent Market Operator). The asset management issue is that if the licensee wishes to maintain its portfolio objectives there are emerging time constraints between retirement of existing plant and possible replacements.

The asset mission report is linked to the Licensee's strategic plan and while the Licensee has acted responsively to the changed environment it is not clear that a strategic process triggering such a review exists. The process could be more formalised.

The power station 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.

Recommendation

Consideration is given to a visible scheduled review process of the asset mission report. To maintain portfolio capacity at 3000 MW, examine strategies for expediting portfolio replacement given the long lead time for replacement.

Rating

Quantitatively controlled - 4

Asset Creation	Effectiveness rating Well defined - 3

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

Process	☑	Documentation	☑	Availability	☑	Use	☑

Procurement of major generating plant is a very significant exercise taking considerable time. Plant such as Collie requires approvals to the highest levels of Government. The Licensee has followed appropriate procedures in the past but only the relatively small Kalbarri wind farm was acquired in the review period. The Licensee tendered for the works in different packages, including bulk supply for wind turbines (Kalbarri, Hopetoun and Denham), power static compensator to contractor Power Corp (a company related to NT Power and Water) and structural elements to selected contractors.

Issues

The procurement processes are appropriate for the scale of works.

Rating

Well defined - 3

Asset Disposal	Effectiveness rating Well Defined - 3

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

Process	☑	Documentation	☑	Availability	☑	Use	☑

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 recent 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.

The retirement strategies are well defined.

No disposal issues post retirement has arisen in the review period so no opinion can be drawn as to that element of asset disposal. Plans have started at Kwinana for post retirement/removal of Stage B. This can be a very complex matter and significant planning will be required to manage the many complex issues such as removal of asbestos and site remediation for alternative generation options.

The current plans for Muja stages A/B do not involve removal of the plant

Issues

Disposal strategies post retirement need to be drawn up to manage that element of asset disposal.

Recommendation

The post retirement plans need to be advanced particularly for Kwinana stage B.

Rating

Well defined - 3

Environmental analysis	Effectiveness rating Well defined - 3

4. Environmental analysis

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

Observations

Process	☑	Documentation	☑	Availability	☑	Use	☑

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.

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 is providing system support during the recent gas shortage and may have to provide support for summer load without capacity payments. The IMO should provide extra flexibility to deal with such contingencies.

Rating

Well defined - 3

Asset operations	Effectiveness rating Quantitatively controlled - 4

5. Asset operations

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

Observations

Process	☑	Documentation	☒	Availability	☒	Use	☑

Kwinana Power Station (KPS) consists of 6 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 B consists of 2 x 120MW gas or oil fired units while Stage A consists of 2 x 120MW units capable of burning gas or coal. 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 2010 at the earliest. The Licensee is also seeking environmental approval to extend coal firing until end of plant life (2015). 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. As a result of this all of the KPS plant 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). Stage B is scheduled for retirement in 2008. There has been considerable automation at Kwinana enabling the required careful management of operating in mid merit and peaking mode more efficiently.

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 baseload within its load range of 160 MW – 240 MW. While the most efficient, the plant has tended to be operated as mid merit plant (for which it was specified) due to gas availability restrictions.

Muja Power Station (MPS) is the state's largest power plant and consists of 8 units of varying capacity, age, efficiency and reliability. Muja Stage D has been recently upgraded increasing the capacity of each unit to 215 MW. Stage D now has a peaking capacity of 2 x 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 load is lower overnight. The plant's reliability has deteriorated in recent years as a result of a decrease in maintenance expenditure and age of the plant. Muja Stage C consists of 2 x 200MW units and has also experienced declining reliability over recent years. Muja Stages A and B were retired in April 2007. Subsequently Muja stage B has been temporarily returned to service to alleviate the impacts of the Varanus island incident. The Muja stage B units are the oldest units still operating in the portfolio.

Collie Power Station (CPS), consisting of a single unit, was recently upgraded to 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 baseload regime. It is currently providing high levels of reliability as expected from plant of its age. Operations are contracted to Transfield Worley (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 dispatch 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 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 order plant is despatched to manage hours used and maintenance. The Kalbarri plant is being commissioned and not yet in operational service.
The remote systems are contracted to Power Corp for operations and maintenance.

Issues

The Kwinana plant operates as mid merit or peaking which leads to less than optimal running of plant that originally was base load 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 provide backup for wind plant taking the load when the wind generation drops and this can be very frequent load changes, decreasing efficiency and increasing maintenance. Providing that the plant is operated within allowable rates of temperature and load change, further reduction of plant life is unlikely but maintenance will be higher than for base load operation where load cycling and starts are minimised (plant gets hot and remains so). 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 manufacture. 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.

Muja plant is undergoing a similar automation 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 has been using a relatively small (3% of wood to coal input to burner) amount of wood residue from a timber mill that was constructed on the site for the purpose of obtaining steam in exchange for biomass fuel. There has been an incident in a grinding mill related to this renewable source and biomass co-firing is currently suspended.

Investigations are underway but this is a serious safety issue and must be fully resolved before further action is taken with this biomass material at Muja. An independent expert review of the report and the suitability of the boilers to burn this fuel is considered to be essential.

Collie had a major fault with the Intermediate pressure turbines blades rubbing on the casing leading to a blade fracture and the machine halting. The timing was unfortunate as the repairs were not complete when the gas shortage occurred and the effects of the gas supply problems would have been greatly reduced had Collie been operational at the time. However the gas shortage was not at peak load time and outages could readily have been scheduled anyway. The investigation is not complete but there is no current indication that this had an operational or maintenance cause.

Muja restoration to service of Stages A & B was a significant exercise given that the plant had been place in a care and preservation mode. All machines were judged as being capable of being placed into service but a risk analysis indicated that machines 3 and 4 were easier to reinstate than machines 1 and 2. The reinstatement was successful.

Stages A and B at Muja seem likely to be required for summer capacity support, however with a 2 year registration time for the IMO the Licensee will not receiving capacity payments and just energy payments.

Recommendation

Investigations, with appropriate independent expert input, into the safety issues at Muja about burning wood in a coal plant is completed before any further action with this material is considered at Muja.

Rating

Quantitatively controlled - 4

Asset Maintenance	Effectiveness rating Quantitatively controlled - 4

6. Asset maintenance

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

Observations

Process	☑	Documentation	☑	Availability	☑	Use	☑

Maintenance at the power stations operated by the Licensee is controlled by a sophisticated IT system that coordinates tasks, incorporates condition, risk, breakdown and time based maintenance. Maintenance jobs are standardised which 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.

Kwinana is operating with a maintenance regime for stages A and B that provides the necessary maintenances to keep the plant operating up to the next scheduled outage and a 3 year horizon. This is more than a minimal maintenance strategy that could be considered for plant that is due to be retired. 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.

A step-up power transformer had a failure at Kwinana but as a spare was available at Muja the outage was minimised. The cause of the failure was a small brass strip in the tap changer breaking and causing a short circuit.

Cockburn is operating at less than optimal conditions which are baseload. 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.

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.

Issues

The recent 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.

Based on the current information, the Collie fault does not seem to be a maintenance issue.

The transformer failure at Kwinana was due to a very remote circumstance and one for which maintenance would not have readily prevented.

The gas turbines section does not use the Ellipse maintenance system (used by the large power stations) for maintenance scheduling for gas turbines as it is regarded as too sophisticated for their scale of operations. Currently maintenance history of gas turbines is recorded in Ellipse.

Recommendation

Consideration is given to gas turbines and renewable systems extending the use of Ellipse for maintenance scheduling for portfolio wide consistency.

Rating

Quantitatively controlled - 4

Asset Management Information System	Effectiveness rating Quantitatively controlled- 4

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

Process	☑	Documentation	☑	Availability	☑	Use	☑

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. There is a strong document management system to manage and give on line access to documents including drawings.

Access to write to the database is controlled (passwords) and changes are tracked. The

systems are backed up regularly to ensure data integrity.
Issues
None
Recommendation
None
Rating
Quantitatively controlled 4

Risk management	Effectiveness rating Well Defined- 3

8. Risk management

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

Observations

Process	☑	Documentation	☑	Availability	☑	Use	☑

The Licensee has a good documented risk management system 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. Significant coal stockpiles are held at both Muja and Collie PS which is sufficient for most reasonable contingency events.

Issues

While there are bushfire response measures and vegetation management processes in place at Muja, there should be an inspection process to ensure that the fire risks are managed.

Recommendation

An inspection system is put in place to ensure bush fire mitigation is effective particularly at Muja.

Rating

Well Defined- 3

Contingency planning	Effectiveness rating Well defined - rating 3

9. Contingency planning

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

Observations

Process	☑	Documentation	☑	Availability	☑	Use	☑

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

Fuel contingencies are provided with local stockpiles of coal and fuel oil. 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.

Issues

The recent 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 much significant than the loss of the single largest generation unit and for this Licensee was nearly a third of nameplate capacity. Currently the licensee has all the coal plant. With the retirement of coal plant the gas fuel would 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 but is constrained with the capacity limit and financial considerations from advancing the replacement plans.

Recommendation

None

Rating

Well defined - 3

Financial planning	Effectiveness rating Well defined - rating 3

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

Process	☑	Documentation	☑	Availability	☑	Use	☑

The Licensee has 5 year rolling financial plans linked to the Strategic Development Plans that are required by the owner (government).

Issues

None

Recommendation

None

Rating

Well defined - rating 3

Capital expenditure planning	Effectiveness rating Well defined - rating 3

11. Capital expenditure planning

The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years.

Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates.

Observations

Process	☑	Documentation	☑	Availability	☑	Use	☑

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

Issues

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)

Recommendation

None

Rating

Well defined - rating 3

Review of AMS	Effectiveness rating Performed informally - rating 1

12. Review of AMS

The asset management system is regularly reviewed and updated.

Observations

Process	☑	Documentation	☒	Availability	☒	Use	☒

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.

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.

Recommendation

A process be implemented that schedules regular review of the asset management system.

Rating

Planned and tracked - rating 2