



Review Report for the Asset Management System Review of Ord Hydro



Final Rev A
October 2011



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Table of Contents

1	Executive Summary.....	4
2	Statement of Independence	6
3	Limitations Statement.....	7
4	Definitions.....	8
5	Scope of the Review.....	9
5.1	<i>Review Objectives</i>	9
5.2	<i>Review Methodology</i>	9
5.3	<i>Review Participants</i>	11
6	Actions from the Previous Review	12
7	Performance Summary	15
8	Observations	16
9	Recommendations	35
10	Changes to the Licence	37
11	Signatures	38
	Appendix A. Post-review Implementation Plan	39
	Appendix B. Risk Assessment / Review Plan	41

Document History

Revision	Date Issued	Reviewed By	Approved By	Date Approved
1 st Draft	9/8/2011	Darren Sexton	Darren Sexton	30/8/2011
2 nd Draft	31/8/2011	Darren Sexton	Darren Sexton	31/8/2011
Final	4/10/2011	Shirin Renaud	Darren Sexton	14/10/2011
Final Rev A	14/10/2011			

Distribution of Copies

Revision	No. of Copies	Issued to
1 st Draft	1 electronic	Darren Sexton
2 nd Draft	1 electronic	Darren Sexton
Final	1 electronic	Darren Sexton
Final Rev A	1 electronic	Darren Sexton

1 Executive Summary

Under section 14 of the Electricity Industry Act 2004 (WA) and as a condition of its current Integrated Regional License, Pacific Hydro appointed The Asset Partnership to conduct an independent Asset Management System Review.

The previous Asset Management Review, dated December 2008, resulted in a renewal of the Integrated Regional Licence including a twelve month extension on the standard two yearly requirement for such reviews.

While there are no significant changes to the Ord Hydro's assets since the previous review, Pacific Hydro has undertaken significant improvements to its Asset Management System as part of a business wide improvement initiative. As such, many of these changes apply to Ord Hydro with resulting in improvements on the effectiveness ratings in certain aspects of their asset management system.

As a result of the Asset Management Review there are several recommendations summarised in the table below:

Asset Management System Component	Issue	Recommendation	Post Audit Action Plan
1.3 Non-asset options (e.g. demand management) are considered	The Asset Management System does not specify a requirement to assess non-asset solutions	Include in the requirement for assessment of non-asset solutions in the Asset Management Framework and Codes and any other necessary documentation	To update asset management codes or internal procedures to encourage consideration of non-asset solutions
3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process	Pacific Hydro's "Operational Performance Review Process" requires regular reviews to be conducted of all assets. To-date, the Ord Hydro has not been reviewed in accordance with this requirement	Conduct an Operational Performance Review as per the Pacific Hydro OPR process by the end of July 2013	Conduct OPR at the Ord
4.3 Compliance with statutory and regulatory requirements	There is no central register of Ord Hydro specific statutory and regulatory requirements	Develop an Ord Hydro specific register of statutory and regulatory requirements including reporting and monitoring actions to ensure compliance	Implement compliance register for Ord Hydro

Asset Management System Component	Issue	Recommendation	Post Audit Action Plan
5.5 Staff receive training commensurate with their responsibilities	While a training plan has been developed, implementation has not been carried out. Training is not being conducted on a frequent basis and records are not being kept	Plan specific dates for various training and follow through on training plan, documenting training as it occurs	Update personnel training and records to align with training plan
7.2 Input controls include appropriate verification and validation of data entered into the system	Have not fully verified correct configuration and operation of the Energy Allocation functionality configured into the Ord Hydro SCADA System since the Water Corporation Energy Allocation Design change in August 2010. This is not critical until lake levels drop significantly from existing levels.	Carry out the verification test for the Energy Allocation functionality configured into the Ord Hydro SCADA System when lake conditions are appropriate	Complete the energy allocation functionality test
8.3 The probability and consequences of asset failure are regularly assessed	A major component FMECA was developed in November 2009. However, there are no plans to update the FMECA and there is currently no requirement in the Asset Management System to do so	Include in the Asset Management Codes, or any other relevant procedure, that plans must be in place to periodically review and update the FMECA	Update the asset management plan to include routine FMECA
9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	The Asset Management System does not require that contingency plans for general risks	Update the AM Framework Codes, or other relevant procedure, to include a requirement to develop site specific contingency plans that are regularly reviewed and tested to confirm the expected results	Update the asset management codes to include the requirement for contingency plans and develop a procedure to prepare, review and test these

Table 1 – Summary of Recommendations

While the list of recommendations represent areas where asset management systems could be improved upon, it is The Asset Partnership's opinion that Ord Hydro is currently being managed responsibly. Ord Hydro's assets are of relatively low complexity and their asset management systems are in general scaled to suit this characteristic.

2 Statement of Independence

Pacific Hydro cooperated fully with all questions asked of them during this Asset Management Review. The Asset Partnership has acted independently and exercised professional and engineering judgement while undertaking the review. Professional scepticism was exercised at all times during the review and evidence was gathered as appropriate in accordance with the Audit Guidelines: Electricity, Gas and Water Licences 2010.

3 Limitations Statement

The Asset Partnership has undertaken this review and prepared this report in alignment with the requirements set out by the Economic Regulation Authority and based on the information presented by Pacific Hydro and the Ord Hydro Partnership. This report accurately represents the evidence provided during the review. While the review sort evidence regarding process, policy and performance, it was not the intention of the review to validate the accuracy of any data provided. As such, The Asset Partnership shall not be held liable for loss or damage to third parties due to reliance on the information contained in this report.

4 Definitions

In this review:

“AM” means Asset Management

“AMS” means Asset Management System

“AVR” means Automatic Voltage Regulator

“FMECA” means Failure Mode and Effects Analysis; a process to determine the consequences of equipment failure

“OEM” means Original Equipment Manufacturer

“OPS NAS” means Network-attached storage; a hard drive used for networked computer information storage

5 Scope of the Review

5.1 Review Objectives

Section 24 of Ord Hydro's Integrated Regional Licence states that the licensee must provide the Authority with an independent expert review of the effectiveness of the asset management system every 24 months. The purpose of this review is to ensure the licensee is properly managing the maintenance, expansion or reduction of the generating works or transmission system.

The Asset Partnership was engaged to conduct the independent review for the period between the 1st July 2008 and the 30th June 2011. A Review Plan dated July 2011 was developed in accordance with the Audit Guidelines: Electricity, Gas and Water Licences August 2010 utilising the AMS Effectiveness Framework as the basis for the review. The framework focussed on the following key processes:

- Asset planning;
- Asset creation and acquisition;
- Asset disposal;
- Environmental analysis;
- Asset operations;
- Asset maintenance;
- Asset management information system;
- Risk management;
- Contingency planning;
- Financial planning;
- Capital expenditure planning; and
- Review of the Asset Management System

5.2 Review Methodology

For each criteria within the key processes listed above, both process and policy definition, and performance ratings were assessed during the review. These ratings are shown in Table 2 and Table 3 below.

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

Table 2 – Asset Management Process and Policy Definition Adequacy Ratings

Rating	Description	Criteria
1	Performing effectively	<ul style="list-style-type: none"> The performance of the process meets or exceeds the required levels of performance. Process effectiveness is regularly assessed, and corrective action taken where necessary.
2	Opportunity for improvement	<ul style="list-style-type: none"> The performance of the process requires some improvement to meet the required level. Process effectiveness reviews are not performed regularly enough. Process improvement opportunities are not actioned.
3	Corrective action required	<ul style="list-style-type: none"> The performance of the process requires significant improvement to meet the required level. Process effectiveness reviews are performed irregularly, or not at all. Process improvement opportunities are not actioned.
4	Serious action required	<ul style="list-style-type: none"> Process is not performed, or the performance is so poor that the process is considered to be ineffective.

Table 3 – Asset Management Performance Ratings

Recommendations are required where a process and policy rating is deemed to be either a C or D, and where an asset management performance rating is a 3 or 4.

5.3 Review Participants

The asset management system review was conducted largely at Ord Hydro's Kununurra office over a two day period starting Tuesday 2nd August. Ord Hydro representatives present during the review were Darren Sexton (Executive Manager Operations, Australia) and Brian Walter (Ord Hydro Manager).

The Asset Partnership review team consisted of Stephen Young and David Wiley. Both review team members were involved during the entire two day review.

Prior to the review a list of documents were collected that were deemed relevant as evidence required for effectiveness rating. These documents are listed under each effectiveness criteria in section 8 Observations.

6 Actions from the Previous Review

There were seven actions recommended during the previous review to address identified areas of low asset management system effectiveness. These recommendations are listed in Table 4 below.

Ref Item No	Recommendation	Licensee Action	Documents/Evidence Gathered	Further Action Required
1.7	Review risk assessment of asset failure to component level. Investigate Failure Mode and Effect (FMEA) analysis in relation to maintenance strategy.	A high level FMEA has been conducted covering the major components of the hydro station	Failure mode and effect analysis report "Ord Maintenance Review Nov09"	Nil
3.1	Develop asset performance review procedure to form documented basis of systematic reviews.	Currently conducting monthly reviews of performance results and have put in place a procedure for reviewing performance on an annual basis. While this review process is being systematically applied across all Pacific Hydro Assets, Ord Hydro has yet to be reviewed. It is the intention for this review to take place in the near future	Annual Performance Review Procedure "Operational Performance Review Process (OPR)"	Nil

Ref Item No	Recommendation	Licensee Action	Documents/Evidence Gathered	Further Action Required
3.4	Long term: require documented asset disposal plan detailing strategy and estimated costs for dismantling, removal and rehabilitation.	An asset disposal plan has not yet been actioned. While Pacific Hydro appreciate that this is a necessary process, the design life of the asset is approximately 6 years from now. Asset operation may be extended beyond the original design life depending on the performance/cost/risk balance. Consequently it is a low priority at the moment	"Asset Management Code: Asset Disposal/Renewal" sighted which requires that assets approaching end of life be recognised and planning for through the asset planning process. Project Management Tollgate Process "Project Tollgate Review Framework and Process FINAL" sighted which outlines the governance for significant disposal/renewal projects.	No further action required in the short term i.e. the next 24 months
5.1	Develop operational procedure review process to determine procedure's relevance and accuracy.	Pacific Hydro's Change Management procedure covers any changes made to equipment that require updating of documented operational procedures	"PHA.OPS.12.001 Change Management Procedure"	Nil

Ref Item No	Recommendation	Licensee Action	Documents/Evidence Gathered	Further Action Required
6.1	Develop maintenance procedure review process to determine procedure's relevance and accuracy.	While a process specific to maintenance procedure review has not been developed, the Change Management Procedure generically covers revision of procedures where changes to configuration have occurred	"PHA.OPS.12.001 Change Management Procedure"	Nil
11.3	Develop asset management strategy plan detailing identification and justification for application of capital expenditure in correlation of asset life.	An Ord specific Asset Management Plan has been developed in-line with the Pacific Hydro Asset Management Framework	"Ord Hydro Asset Management Plan v2"	Nil
12.1 and 12.2	Develop Asset Management Plan strategy document.	A Company-wide framework for managing assets has been documented and partly implemented at Ord Hydro. Implementation of the framework is conducted on a prioritised as needs basis	"Asset Management Framework and Codes", "Ord Hydro Asset Management Plan v2"	Nil

Table 4 - Previous Review Recommendations

It is The Asset Partnership's opinion that all recommendations have been responded to in the appropriate manner inline with the intentions of the previous reviewer.

7 Performance Summary

Table 5 contains a summary of The Asset Partnership's assessment of Ord Hydro's asset management effectiveness.

Asset Management System	Asset Management Process and Policy Definition Adequacy Rating	Asset Management Performance Rating
Asset planning	B	1
Asset creation/acquisition	B	2
Asset disposal	B	2
Environmental analysis	B	2
Asset operations	B	2
Asset maintenance	B	2
Asset Management Information System	A	2
Risk management	B	2
Contingency planning	C	2
Financial planning	B	2
Capital expenditure planning	A	2
Review of AMS	A	1

Table 5 – Asset Management Effectiveness Summary

Detailed effectiveness ratings for each criteria of the framework can be seen in section 8 Observations.

8 Observations

Observations for each review criteria are summarised in Table 6 below.

Effectiveness Criteria	The audit will check the following working documents as appropriate	The audit will check the following procedures	Asset Management Process and Policy Definition Adequacy Rating	Asset Management Performance Rating	Observations
1. Asset planning					
1.1 Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	Asset Management Plan	Business objectives, and Asset Management Plan, Strategic Asset Planning Process	A	1	Asset Management Plan sighted which outlines the business objectives and the link between these and the asset management plan actions. Document "PHA.OPS.07.001 Strategic Planning Process" outlining the procedure for the development of Asset Management Plans sighted. Some progress made on action items
1.2 Service levels are defined	PPAs	Asset Management Framework and Codes	A	1	Sighted both ADM and Horizon Power PPAs specifying revenue metre accuracy, unplanned interruptions, quality standards, planned interruptions. Interruptions for each year were sighted in document "Incidents.xls" and "Monthly Report 201106.xls"

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>1.3 Non-asset options (e.g. demand management) are considered</p>	<p>Asset Management Plan</p>	<p>Asset Management Framework and Codes</p>	<p>C</p>	<p>N/A</p>	<p>Sighted the Asset Management Framework Codes. There was no mention of a requirement to consider non-asset solutions. During the review period there were no opportunities identified where non-asset solutions were appropriate</p>
<p>1.4 Lifecycle costs of owning and operating assets are assessed</p>	<p>Asset Management Plan</p>	<p>Asset Management Framework and Codes</p>	<p>A</p>	<p>2</p>	<p>"Asset Management Code: Asset Management Planning" contains a requirement to develop a lifecycle overview which includes key milestones. "Asset Management Code: Concepts, Site Design and Layouts" requires that lifecycle cost for the support of the asset be considered when selecting new assets. "Asset Management Code: Financial Modelling For Lifecycle Cost" requires that the lifecycle cost profile be considered for project evaluation. Document "Ord MV Lease vs Buy.xls" demonstrates the lifecycle costs of a capital purchase</p>
<p>1.5 Funding options are evaluated</p>	<p>Letter to ADM seeking funding assistance for a capital project</p>	<p>Asset Management Framework and Codes</p>	<p>B</p>	<p>2</p>	<p>While there is no mention of funding options in the Asset Management Framework and Codes, expenditure is required to be classified between Capex and Opex. Funding options include owner purchase or lease, and in some cases customer funded. Example of transformer that was purchased by ADM but owned, operated and maintained by Ord Hydro. Document "Ord MV Lease vs Buy.xls" sighted which calculates the NPV of lease vs buy options</p>

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

1.6 Costs are justified and cost drivers identified	Asset Management Plan, Budget Detailed P&L, O&M Plan for cost drivers	Asset Management Framework and Codes	A	1	"Asset Management Code: Cost Management" requires that unscheduled maintenance costs are differentiated from scheduled maintenance costs and all maintenance costs be separated into categories such as labour, spares etc. The code also requires that significant cost events be forecast. Budget 10/11 sighted demonstrating detailed cost breakdown in alignment with the code
1.7 Likelihood and consequences of asset failure are predicted	Ord Draft Maint Plan (Alistair's Review)	Asset Management Framework and Codes	B	2	"Asset Management Code: Maintenance and Condition Monitoring" requires that maintenance reviews be conducted to determine root causes and consequences of failures. While this is more retrospective in approach, it satisfies the intention to improve long term reliability of the assets. A major component FMECA (document "Ord Maintenance Review Nov09") was sighted demonstrating a rigorous approach to the failure analysis
1.8 Plans are regularly reviewed and updated		Strategic Asset Planning Procedure	A	1	"Asset Management Code: Asset Management Planning" requires that annual reviews of the AMPs are conducted. The previous AMP was developed for Ord early 2011 and is therefore due for review in 2012.

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>2. Asset creation and acquisition</p>					
<p>2.1 Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions</p>	<p>Acquisition or creation documents or statement that no acquisitions or creations have occurred</p>	<p>Corporate Tollgate Process</p>	<p>B</p>	<p>2</p>	<p>"Asset Management Code: Concepts, Site Design and Layout" requires that an evaluation be undertaken of a new asset. "Asset Management Code: Equipment Supply and Operation Support" requires that a review of alternative suppliers of a new asset is undertaken. There is no mention of non-asset solutions. The Project Tollgate Reviews Process ensures that these project evaluations are suitably rigorous before investment is committed to. An example of the installation of new walkways at the station was sighted but the Capex format was not used due to the value was less than the minimum threshold stated in the "PHA.OPS.15.001 Financial Management Procedure".</p>
<p>2.2 Evaluations include all lifecycle costs</p>	<p>Acquisition or creation documents or statement that no acquisitions or creations have occurred</p>	<p>Corporate Tollgate Process</p>	<p>B</p>	<p>2</p>	<p>"Asset Management Code: Financial Modelling for Asset Lifecycle" requires that lifecycle costs are considered. The "Project Tollgate Review Process" tollgate 2 requires that a detailed financial model be developed for any project to pass this tollgate. Document "Ord MV Lease vs Buy.xls" sighted which demonstrates the inclusion of lifecycle costs in the financial evaluation</p>

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>2.3 Projects reflect sound engineering and business decisions</p>	<p>Acquisition or creation documents or statement that no acquisitions or creations have occurred</p>	<p>Corporate Tollgate Process</p>	<p>B</p>	<p>2</p>	<p>"Asset Management Code: Concepts, Site Design and Layout" requires that new asset solutions are developed in consultation with Operations personnel. The "Project Tollgate Reviews Process" requires that risks are assessed with the solution before expenditure is sanctioned. The "Ord AMP" asset management plan consists of a capital plan. This plan was developed in consultation with Operations over a two day period. The primary purpose of the consultation process is to increase the technical feasibility of solutions and ensure sound business decisions are made.</p>
<p>2.4 Commissioning tests are documented and completed</p>	<p>Acquisition or creation documents or statement that no acquisitions or creations have occurred</p>	<p>Corporate Tollgate Process</p>	<p>A</p>	<p>1</p>	<p>"Asset Management Code: Commissioning and Handover" requires that commissioning plans are submitted, personnel are involved and documentation of tests are submitted. The "Project Tollgate Reviews Process" tollgate 4 requires that the documentation is submitted before practical completion is signed off. Example of "Commissioning Report for AVR upgrade" dated May 2011 was sighted</p>
<p>2.5 Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood</p>	<p>Acquisition or creation documents or statement that no acquisitions or creations have occurred</p>	<p>Corporate Tollgate Process</p>	<p>B</p>	<p>N/A</p>	<p>"Asset Management Policy" sighted indicates commitment to meeting all legal, environmental and safety obligations. "Asset Management Code: Compliance" sighted which states that responsibilities are defined and plans and systems are in place for managing compliance of operational assets. No examples</p>

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

					identified where legal/environmental or safety obligations were applicable to the minor capital projects undertaken during the audit period
3. Asset disposal					
3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process	Operational performance review	Bi-annual operational performance review procedure/ Asset Management Framework and Codes	A	3	Pacific Hydro's "Operational Performance Review Process" was sighted which outlines a regular review process of the performance of all assets. This is used to identify both under-utilised and underperforming assets in order to develop corrective action plans (asset management plans). This review process has not been undertaken for the Ord Hydro. Based on the current performance of the assets and the condition of the assets observed during the review it is unlikely such a review would uncover significant areas requiring action
3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	Root Cause Analysis of faults in July and December 2010	Root cause analysis form, defect reporting procedure, Field Incident Report Procedure	B	1	Pacific Hydro's "Operational Performance Review Process" covers recommendations for disposal where appropriate. Two examples of Incident Investigation Reports were sighted dated 21st Jan 2011. These reports demonstrate examination of the reasons for outages
3.3 Disposal alternatives are evaluated	Disposal documents or a statement that no disposals have taken place	Corporate Tollgate Process	B	2	Code: Asset Disposal/Renewal requires that alternatives for using the energy resource are considered. No asset disposal has taken place in the review period. Old AVR cabinet currently being reviewed for salvaging for spares for another organisation

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>3.4 There is a replacement strategy for assets</p>	<p>Scheduled replacement of batteries, governor (budget and AMP)</p>	<p>Bi-annual operational performance review procedure (review the condition of the asset)</p>	<p>B</p>	<p>2</p>	<p>"Asset Management Code: Asset Disposal/Renewal" requires that disposal of assets is planned through the Asset Planning process. Pacific Hydro's "Operational Performance Review Process" ensures that decisions to dispose of assets are based on asset condition and recommendations are put forward for replacement where necessary. An example of a governor upgrade/replacement was sighted in the capital budget for the 11/12 financial year (document "Aus FY12Budget Capital Template.xls")</p>
<p>4. Environmental analysis</p>					
<p>4.1 Opportunities and threats in the system environment are assessed</p>	<p>Aspect Register, Risk Register</p>	<p>Aspect Register Identification Procedure</p>	<p>B</p>	<p>2</p>	<p>Document "Operations Risk Register.xls" sighted with 2 risks identified specific to Ord. Document "PHA.HSE.03.049 Environmental Aspects" provides the procedure for the development of the Environmental Aspect Register. This covers threats to the environment and highlights opportunities for improvement. Document "PHL Ord River IC Feb 2008 Draft Report" sighted which provides the insurers risk assessment of Ord Hydro's assets. The only deficiency sighted was the time taken for the fire response team to arrive at the power station.</p>

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>4.2 Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved</p>	<p>Waste reduction KPI, Emergency Response Plan, Monthly Reports</p>		<p>B</p>	<p>2</p>	<p>Western Power Corporation (now Horizon Power) Power Purchase Agreement Annual Reconciliation sighted - document "WP2010-11.doc". Monthly Report June 2011 sighted. Major KPIs achieved well within limits.</p>
<p>4.3 Compliance with statutory and regulatory requirements</p>	<p>Waste Transport Certificates, Vegetation Clearance, Environmental Audit Report, Asset Management Policy</p>	<p>Compliance/ Legislation spreadsheet, Internal Audit Program</p>	<p>B</p>	<p>3</p>	<p>"Asset Management Code: Compliance" sighted which requires responsibilities to be defined and plans and systems to be in place for managing compliance of operational assets with:</p> <ul style="list-style-type: none"> a. Legal, regulatory and statutory obligations b. Environmental c. Health and Safety d. Labour regulations e. Technical standards f. Electrical regulations g. Licensing and planning obligations h. Pacific Hydro policies <p>The code also requires that compliance is monitored on an ongoing basis.</p> <p>"Internal Environmental Audit May 2010" sighted - scored 87% overall.</p> <p>"Controlled Waste Tracking Form" dated April 2011 sighted. Pacific Hydro's "Asset Management Policy" sighted which pledges commitment to comply with all statutory and regulatory requirements. Pacific Hydro's "Compliance Policy" sighted which outlines the framework for compliance across all assets. Pacific Hydro's "Compliance Register" sighted which details generic statutory and</p>

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

					regulatory requirements for all Pacific Hydro assets. "Annual Compliance Report" to the ERA for the year 09/10 sighted.
4.4 Achievement of customer service levels	Environmental Incidents Reported, PPAs, Monthly Reports	Spill Cleanup and Reporting Procedure	B	2	"Monthly Report June 2011" sighted which outlines key performance measures. This report is published on a monthly basis. All measures were observed to be well within service levels stated in the PPA. ADM and Horizon Power PPAs sighted. "Power Purchase Agreement Annual Reconciliation 2010/2011" sighted which also outlines key performance indicators. Again, all measures were observed to be well within service levels stated in the PPA. "Environmental Incident Reporting Form" sighted. "PHA.HSE.09.006 Chemical Spill Prevention and Response Procedure" sighted which outlines the procedure to be undertaken in the event of a chemical spill.
5. Asset operations					
5.1 Operational policies and procedures are documented and linked to service levels required	OEM based operating procedures		A	2	Sighted many OEM operating procedures at both the station and the Kununurra Office. Operation of the assets are in accordance with these manuals
5.2 Risk management is applied to prioritise operations tasks	Risk assessment of operational tasks	Risk assessment form	N/A	N/A	Operation of the station is largely automated with minimal input from a single operator located in a remote control room. There is limited scope for risk management to be used to prioritise operational tasks

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>5.3 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</p>	<p>MEX, Asset Management Manual</p>	<p>Bi-annual operational review (condition)</p>	<p>B</p>	<p>2</p>	<p>Pacific Hydro's Operational Performance Review Process requires that a physical inspection of asset condition is undertaken. Asset Management Manual sighted with no issues of equipment in poor condition. No equipment sighted on tour of the substation in poor condition. MEX Asset Register sighted</p>
<p>5.4 Operational costs are measured and monitored</p>	<p>Budget, Monthly Reports</p>		<p>B</p>	<p>2</p>	<p>Budget and Monthly Report sighted. "Asset Management Code: Financial Modelling for Asset Lifecycle" sighted which requires operational costs to be monitored. Document "PHA.OPS.15.001 Financial Management Procedure" sighted which outlines the process for accounting for costs</p>
<p>5.5 Staff receive training commensurate with their responsibilities</p>	<p>Training Plan, Training certificates/ records</p>	<p>Asset Management Framework/ Codes</p>	<p>B</p>	<p>3</p>	<p>"Asset Management Code: Personnel and Training" requires that mandatory and supplementary training be identified for each position and that initial, ongoing and periodic refresher training is provided to meet such requirements. There is currently no training plan in place. Training is not being conducted on a frequent basis and records are not being kept.</p>

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

6. Asset maintenance					
6.1 Maintenance policies and procedures are documented and linked to service levels required	MEX, Asset Management Manual, OEM Manuals	Maintenance Management Procedure.	B	2	Sighted many OEM maintenance manuals. Sighted various MEX (Computerised Maintenance Management System) Planned Maintenance Tasks. Viewed the detailed instructions for 3 Monthly Stator Insulation Inspection which contained high level steps to carry out inspection and reference to manual where necessary.
6.2 Regular inspections are undertaken of asset performance and condition	MEX	Bi-annual operational review (condition)	B	2	The majority of the 151 planned maintenance tasks sighted on MEX are condition based monitoring tasks. A station site visit revealed general overall good condition of the assets. Basic generation and lost time statistics are monitored and reported on a monthly and annual basis. The operational review as required by the "Operational Performance Review Process (OPR)" has not been conducted as yet
6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	MEX, Maintenance Plan		B	2	An air conditioning service was found to be the only overdue maintenance task at the time of the review. This task was overdue by 1 month. New version of MEX did not display the scheduled date of closed off work orders. Other screens within MEX did not provide information needed to verify that completed tasks were closed off on time

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>6.4 Failures are analysed and operational/maintenance plans adjusted where necessary</p>	<p>Root cause analysis of Electrical components. E.g. batteries</p>	<p>Defect Reporting Process (not implemented at Ord)</p>	<p>A</p>	<p>2</p>	<p>"PHA.OPS.09.002 Defect Reporting Procedure" and "PHA.OPS.09.002.1 Defect Report Form" sighted which set out requirements for the management of defects when they occur. An example of rotor failure investigation was sighted. "Ord Incident Investigation Report 25-12-2010" and "Ord Incident Investigation Report 021210" was sighted. Critical recommendations arising from "Ord Incident Investigation Report 25-12-2010" have been actioned</p>
<p>6.5 Risk management is applied to prioritise maintenance tasks</p>	<p>Maintenance Plan</p>	<p>Risk assessment form</p>	<p>B</p>	<p>2</p>	<p>2 examples of risk assessments for maintenance tasks sighted. Form "PHA.HSE.003.002.1" sighted. Document "PHA.HSE.03.001 Hazard Identification Risk Assessment and Control" sighted which describes the procedure to be used when evaluating risk. It is a typical 5x5 matrix with well defined criteria for each rating scale. MEX planned maintenance tasks contain a priority field but it is not being used. Due to the size and low level of complexity of the Ord station there are relatively few maintenance tasks required and little need for prioritisation.</p>
<p>6.6 Maintenance costs are measured and monitored</p>	<p>Budget, Monthly Reports</p>		<p>B</p>	<p>2</p>	<p>Maintenance costs are forecast in the budget and reported through the monthly report. June Monthly Report sighted</p>
<p>7. Asset Management Information System (MIS)</p>					

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

7.1 Adequate system documentation for users and IT operators	Scada User Manual, MEX Manual, Sharepoint Manual, SAP Manual		B	2	Sighted SAP manuals on the intranet, MEX on-line help and Intouch User Manual (SCADA). Interview with operator revealed these manuals to be adequate
7.2 Input controls include appropriate verification and validation of data entered into the system	Water release rules software parameter changes (document)		A	3	An example of the development of a test procedure for lake level parameter verification was sighted "EAB_TestProcedure_R2". Email sighted from contractor carrying out testing. As the lake has not been at the level required to adequately carry out the test, verification has not been achieved.
7.3 Logical security access controls appear adequate, such as passwords	Password history	Corporate Password Procedure	A	2	ICT Password Policy sighted. This policy outlines the requirements for password content and duration before expiry. The network login is automatically setup to comply with the requirements but the Scada system relies on the operator to manually change the password on a regular basis.
7.4 Physical security access controls appear adequate	Site security contains fencing around site compound, padlocked gates, sensors on building doors, logged entry. Site is remote, benefit from further alarming minimal due to lack of surrounding infrastructure and transit time. Town office is alarmed and CCTV present.		B	2	Kununurra Office has 3 CCTV cameras which record for a 2 week period. All doors contain locks and there are motion sensors linked to an alarm system. The station has a pad locked fence to the drive access and there is further barbed wire fencing surrounding the yard. The doors accessing the power station were monitored with proximity switches. Two switch yards visited contained pad locked or password locked gates with barbed wire fencing.

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

7.5 Data backup procedures appear adequate	Scada backup in Melbourne office	Scada backup procedure	A	1	Document "SCADA Backups - Overview" describes the process for the backup of Scada data on the OPS NAS drive. In addition to daily backup there is a quarterly backup which is stored in the Melbourne office. Other networked information is backed up daily.
7.6 Key computations related to licensee performance reporting are materially accurate	Performance Reports		A	1	Sighted the "Western Power Corporation Power Purchase Agreement Annual Reconciliation Report 2010/2011" which describes the same calculations as sighted in the respective PPA.
7.7 Management reports appear adequate for the licensee to monitor licence obligations	Licence Performance Report		A	1	An Annual Power Purchase Agreement Reconciliation report is provided to ADM. A Monthly Report contains KPI monitoring. An annual Compliance Report, "Ord Hydro Annual compliance 2010" was sighted containing
8. Risk management					
8.1 Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system	Risk register, insurance risk assessment report, EMS Audit Reports, House keeping inspections	Corporate Risk Management Process, ISO 14001 EMS, H&S Procedures	A	2	Sighted a seven page internal Environmental Audit form. Sighted "Risk Management Policy" outlining the Company's commitment and approach to managing risk. Document "Operations Risk Register.xls" sighted with 2 risks identified specific to Ord. Document "PHL Ord River IC Feb 2008 Draft Report" sighted which provides the insurers risk assessment of Ord Hydro's assets.
8.2 Risks are documented in a risk register and treatment plans are actioned and monitored	Risk register, AMP contains outputs of the risk register	Corporate Risk Management Process	A	2	Sighted the Risk Register with two items related to Ord Hydro. Example of 'high voltage risk' appearing in the Asset Management Plan.

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>8.3 The probability and consequences of asset failure are regularly assessed</p>	<p>Ord Draft Maint Plan (Alistair's Review)</p>		<p>C</p>	<p>2</p>	<p>"Asset Management Code: Maintenance and Condition Monitoring" sighted which requires that maintenance reviews be conducted to determine root causes and consequences of failures. While this is more retrospective in approach, it satisfies the intention to improve long term reliability of the assets. A major component FMECA (Ord Maintenance Review Nov09) was sighted. Currently there are no plans to update the FMECA</p>
<p>9. Contingency planning</p>					
<p>9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks</p>	<p>Contingency Plans</p>	<p>Asset Management Framework and Codes</p>	<p>C</p>	<p>2</p>	<p>"Asset Management Code: IT and Computer-Based Support Systems" sighted which requires that contingency plans are documented and tested. There is no requirement for contingency plans for other types of events. An Asset Management Plan action item was sighted which related to the development of a contingency plan for power line failure, flood event on pole, map of power line access. This contingency plan is scheduled to be developed in 2012. Some examples of spare parts holding recommendations resulting from the FMECA have been implemented e.g. generator coolers.</p>
<p>10. Financial planning</p>					

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>10.1 The financial plan states the financial objectives and strategies and actions to achieve the objectives</p>	<p>Budget, Corporate Evaluation Model (5yr), Asset Management Plan</p>		<p>B</p>	<p>2</p>	<p>Business Plan 2010-2015 sighted outlining the business strategies and objectives. "Corporate Evaluation Model" sighted which outlines revenue and cost forecasts out to 2031. The budget (sighted) provides more detail for the current year. Ord Asset Management Plan sighted which details annual generation, revenue and cost targets and provides a list of actions required to achieve those objectives</p>
<p>10.2 The financial plan identifies the source of funds for capital expenditure and recurrent costs</p>	<p>Budget (assumes internally funded for all capital projects)</p>		<p>B</p>	<p>2</p>	<p>Asset Management Plan (sighted) provides the amount of capital expenditure planned for each year. The plan assumes that all capex is internally funded. However, it is understood that some items will likely be jointly funded with the customer. This is handled informally at the time of negotiation for the joint funding</p>
<p>10.3 The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)</p>	<p>Budget (1yr), Business Plan (5yr), Corporate Evaluation Model (20yr)</p>		<p>B</p>	<p>2</p>	<p>"Evaluation Model" sighted which provides EBIT projections and provides inputs for balance sheets. "PHA.OPS.15.001 Financial Management Procedure" sighted which provides a high level procedure for managing budgets</p>
<p>10.4 The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period</p>	<p>Business Plan</p>		<p>B</p>	<p>1</p>	<p>"Evaluation Model" sighted which provides EBIT projections and provides inputs for balance sheets. "PHA.OPS.15.001 Financial Management Procedure" sighted which provides a high level procedure for managing budgets</p>

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

10.5 The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	Budget		B	1	"Evaluation Model" sighted which provides EBIT projections and provides inputs for balance sheets. "PHA.OPS.15.001 Financial Management Procedure" sighted which provides a high level procedure for managing budgets
10.6 Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary	Monthly Reports		B	2	Monthly report sighted which compares budget vs actual income and expenses. A formal meeting is held to discuss major variances with corrective actions developed where needed. "PHA.OPS.15.001 Financial Management Procedure" sighted which specifies a variance of greater than \$100k to be analysed
11. Capital expenditure planning					
11.1 There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates	Asset Management Plan, Business Plan		A	2	"Ord Asset Management Plan" sighted which outlines annual capex requirements based on the planned activities. Business plan sighted outlining high level actions to be taken to achieve objectives
11.2 The plan provides reasons for capital expenditure and timing of expenditure	Business Plan	Asset Expenditure Form	A	1	"Ord Asset Management Plan" sighted which outlines annual capex requirements based on the planned activities. The structure shows the link between the expenditure and the strategy which supports the business objectives. Document "PHA.OPS.07.001 Strategic Planning Process" outlining the procedure for the development of Asset Management Plans sighted.

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>11.3 The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan</p>	<p>Asset Management Plan and Business Plan</p>	<p>Strategic Asset Planning Procedure</p>	<p>A</p>	<p>1</p>	<p>Document "PHA.OPS.07.001 Strategic Asset Planning" sighted which comprehensively outlines the requirements to consider prior to the development of the capital budget. These considerations include the asset life cycle as well as current asset condition. Ord's "Asset Management Plan" sighted</p>
<p>11.4 There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned</p>		<p>Strategic Asset Planning Procedure</p>	<p>B</p>	<p>2</p>	<p>"Asset Management Code: Cost Control" requires capital costs to be monitored monthly and controlled against expected budget and timeframes. While the "PHA.OPS.07.001 Strategic Asset Planning" document sighted outlines the process to develop the plan, it doesn't specify the need for regular monitoring and updating. This monitoring process is performed in the monthly meeting and sighted on the "201106-TheOrd" spreadsheet used as a template. There were no examples of changes needed to the capital plan or major variances from the plan</p>
<p>12. Review of AMS</p>					

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

<p>12.1 A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current</p>	<p>AMBE Report</p>	<p>AMBE (Asset Management Benchmarking) Process, Strategic Asset Planning Procedure</p>	<p>A</p>	<p>1</p>	<p>"AMBE - ORD performance assessment worksheet 2009" sighted which provides a mechanism to assess the asset's compliance to the Asset Management Framework and assess the framework's appropriateness to the site. "PHA.OPS.07.001 Strategic Asset Planning" is an annual process to develop asset management plans. "Ord Hydro Asset Management Plan v2" was developed in 2011 for the first time and is not yet due for review</p>
<p>12.2 Independent reviews (eg internal audit) are performed of the asset management system</p>	<p>AMBE Report</p>	<p>AMBE (Asset Management Benchmarking) Process</p>	<p>A</p>	<p>1</p>	<p>Asset Management Benchmarking is conducted to determine:</p> <ul style="list-style-type: none"> - Which elements have been developed - Which are in use - Which are working well and adding value - Which are not working so well <p>"AMBE - ORD performance assessment worksheet 2009" sighted which provides this assessment with recommended actions</p>

Table 6 – Observations Made During the Review

9 Recommendations

The recommendations resulting from this review are detailed in Table 7 below. While the issue was developed as part of the review process, the recommendations have been developed by the licensee and do not form part of The Asset Partnership's opinion.

Asset Management System Component	Process and Policy Definition Adequacy Rating	Performance Rating	Issue	Recommendation
1.3 Non-asset options (e.g. demand management) are considered	C	N/A	The Asset Management System does not specify a requirement to assess non-asset solutions	Include in the requirement for assessment of non-asset solutions in the Asset Management Framework and Codes and any other necessary documentation
3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process	A	3	Pacific Hydro's "Operational Performance Review Process" requires regular reviews to be conducted of all assets. To-date, the Ord Hydro has not been reviewed in accordance with this requirement	Conduct an Operational Performance Review as per the Pacific Hydro OPR process by the end of July 2013
4.3 Compliance with statutory and regulatory requirements	B	3	There is no central register of Ord Hydro specific statutory and regulatory requirements	Develop an Ord Hydro specific register of statutory and regulatory requirements including reporting and monitoring actions to ensure compliance
5.5 Staff receive training commensurate with their responsibilities	B	3	There is currently no training plan in place for operators. Training is not being conducted on a frequent basis and records are not being kept	Plan specific dates for various training and follow through on training plan, documenting training as it occurs

Asset Management System Component	Process and Policy Definition Adequacy Rating	Performance Rating	Issue	Recommendation
7.2 Input controls include appropriate verification and validation of data entered into the system	A	3	Have not fully verified correct configuration and operation of the Energy Allocation functionality configured into the Ord Hydro SCADA System since the Water Corporation Energy Allocation Design change in August 2010	Carry out the verification test for the Energy Allocation functionality configured into the Ord Hydro SCADA System when lake conditions are appropriate
8.3 The probability and consequences of asset failure are regularly assessed	C	2	A major component FMECA was developed in November 2009. However, there are no plans to update the FMECA and there is currently no requirement in the Asset Management System to do so	Include in the Asset Management Codes, or any other relevant procedure, that plans must be in place to periodically review and update the FMECA
9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	C	2	The Asset Management System does not require that contingency plans for general risks	Update the AM Framework Codes, or other relevant procedure, to include a requirement to develop site specific contingency plans that are regularly reviewed and tested to confirm the expected results

Table 7 – Recommendations

10 Changes to the Licence

The Asset Partnership has no recommendations to make with regards to changes to the Licence.

11 Signatures

Auditors

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Date: 4/10/2010

Stephen Young
Director
The Asset Partnership

.....

Date: 4/10/2010

David Wiley
Associate Director
The Asset Partnership

Appendix A. Post-review Implementation Plan

Recommendation	Action	Person Responsible	Completion Date
Include in the requirement for assessment of non-asset solutions in the Asset Management Framework and Codes and any other necessary documentation	To update asset management codes or internal procedures to encourage consideration of non-asset solutions.	Darren Sexton	1 July 2012
Conduct an Operational Performance Review as per the Pacific Hydro OPR process	Conduct OPR at the Ord	Darren Sexton	1 July 2013
Develop an Ord Hydro specific register of statutory and regulatory requirements including reporting and monitoring actions to ensure compliance	Implement compliance register for Ord Hydro.	Darren Sexton	31 December 2012
Plan specific dates for various training and follow through on training plan, documenting training as it occurs	Update personnel training and records to align with training plan.	Darren Sexton	1 March 2012
Carry out the verification test for the Energy Allocation functionality configured into the Ord Hydro SCADA System when lake conditions are appropriate	Complete the energy allocation functionality test	Brian Walter	31 September 2011

Recommendation	Action	Person Responsible	Completion Date
Include in the Asset Management Codes, or any other relevant procedure, that plans must be in place to periodically review and update the FMECA	Update the asset management plan to include routine FMECA.	Darren Sexton	31 March 2012
Update the AM Framework Codes, or other relevant procedure, to include a requirement to develop site specific contingency plans that are regularly reviewed and tested to confirm the expected results	Update the asset management codes to include the requirement for contingency plans and develop a procedure to prepare, review and test these.	Darren Sexton	31 December 2011

Table 8 - Post-review Implementation Plan

Appendix B. Risk Assessment / Review Plan

Effectiveness Criteria	Consequence (1=minor, 2=moderate, 3=major)	Likelihood (A=likely, B=probable, C=unlikely)	Inherent Risk (low, medium, high)	Adequacy of existing controls (S=strong, M=moderate, W=weak)	Audit Priority						The audit will check the following working documents as appropriate	The audit will check the following procedures	Persons to be interviewed	Comment
					1	2	3	4	5	N/A				
1. Asset planning														
Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	2	B	Medium	S				✓			Asset Management Plan	Business objectives, and Asset Management Plan, Strategic Asset Planning Process	Darren Sexton	
Service levels are defined	3	B	High	M		✓					PPAs	Asset Management Framework and Codes	Darren Sexton	
Non-asset options (e.g. demand management) are considered	2	C	Medium	M				✓			Asset Management Plan	Asset Management Framework and Codes	Darren Sexton	
Lifecycle costs of owning and operating assets are assessed	2	C	Medium	M				✓			Asset Management Plan	Asset Management Framework and Codes	Darren Sexton	
Funding options are evaluated	1	C	Low	M					✓		Letter to ADM seeking funding assistance for a capital project	Asset Management Framework and Codes	Darren Sexton	Only funded from customers or reinvesting profits
Costs are justified and cost drivers identified	2	B	Medium	M				✓			Asset Management Plan, Budget Detailed	Asset Management Framework and Codes	Darren Sexton	

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

											P&L, O&M Plan for cost drivers			
Likelihood and consequences of asset failure are predicted	3	B	High	W	✓						Ord Draft Maintenance Plan (Alistair's Review)	Asset Management Framework and Codes	Alistair Mills/ Darren Sexton	
Plans are regularly reviewed and updated	2	C	Medium	M				✓				Strategic Asset Planning Procedure	Darren Sexton	Intention is to review annually
2. Asset creation and acquisition														
Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions	2	C	Medium	S				✓			Acquisition or creation documents or statement that no acquisitions or creations have occurred	Corporate Tollgate Process	Darren Sexton	No acquisition or creation in the previous 3 years
Evaluations include all life-cycle costs	2	C	Medium	S				✓			Acquisition or creation documents or statement that no acquisitions or creations have occurred	Corporate Tollgate Process	Darren Sexton	No acquisition or creation in the previous 3 years
Projects reflect sound engineering and business decisions	3	C	High	M		✓					Acquisition or creation documents or statement that no acquisitions or creations have occurred	Corporate Tollgate Process	Darren Sexton	No acquisition or creation in the previous 3 years
Commissioning tests are documented and completed	3	C	High	S		✓					Acquisition or creation documents or statement that no acquisitions or creations have occurred	Corporate Tollgate Process	Darren Sexton	No acquisition or creation in the previous 3 years
Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood	3	B	High	W	✓						Acquisition or creation documents or statement that no acquisitions or creations have occurred	Corporate Tollgate Process	Darren Sexton	No acquisition or creation in the previous 3 years
3. Asset disposal														
Under-utilised and under-performing assets are	1	B	Low	M				✓			Operational	Bi-annual	Darren Sexton	Bi-annual

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

identified as part of a regular systematic review process											performance review	operational performance review procedure/ Asset Management Framework and Codes		operational performance review is planned for this financial year
The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	1	B	Low	M					✓		Root Cause Analysis of faults in July and December 2010	Root cause analysis form, defect reporting procedure, Field Incident Report Procedure	Darren Sexton	
Disposal alternatives are evaluated	1	B	Low	M					✓		Disposal documents or a statement that no disposals have taken place	Corporate Tollgate Process	Darren Sexton	No disposal in the last 3 years
There is a replacement strategy for assets	2	C	Medium	S					✓		Scheduled replacement of batteries, governor (budget and AMP)	Bi-annual operational performance review procedure (review the condition of the asset)	Darren Sexton	
4. Environmental analysis														
Opportunities and threats in the system environment are assessed	2	B	Medium	W					✓		Aspect Register, Risk Register	Aspect Register Identification Procedure	Darren Sexton	
Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved	2	B	Medium	M					✓		Waste reduction KPI, Emergency Response Plan, Monthly Reports		Darren Sexton	Currently no KPIs related to environment
Compliance with statutory and regulatory requirements	2	B	Medium	S					✓		Waste Transport Certificates, Vegetation Clearance, Environmental Audit Report, Internal Audit Report	Compliance/ Legislation spreadsheet, Internal Audit Program	Darren Sexton	
Achievement of customer service levels	2	C	Medium	M					✓		Environmental Incidents Reported, PPAs, Monthly	Spill Cleanup and Reporting Procedure	Darren Sexton	

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

										Reports			
5. Asset operations													
Operational policies and procedures are documented and linked to service levels required	2	B	Medium	W			✓			OEM based operating procedures		Darren Sexton	
Risk management is applied to prioritise operations tasks	3	A	High	W	✓					Risk assessment of operational tasks	Risk assessment form	Darren Sexton	
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	2	C	Medium	M				✓		MEX, Asset Management Manual	Bi-annual operational review (condition)	Darren Sexton	Accounting data is separate from MEX
Operational costs are measured and monitored	1	A	Medium	S				✓		Budget, Monthly Reports		Darren Sexton	
Staff receive training commensurate with their responsibilities	3	A	High	W	✓					Training Plan, Training certificates/ records	Asset Management Framework/ Codes	Darren Sexton	
6. Asset maintenance													
Maintenance policies and procedures are documented and linked to service levels required	3	B	High	M		✓				MEX, Asset Management Manual, OEM Manuals	Maintenance Management Procedure	Darren Sexton	
Regular inspections are undertaken of asset performance and condition	3	C	High	M		✓				MEX	Bi-annual operational review (condition)	Darren Sexton, Brian Walter	
Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	2	B	Medium	W			✓			MEX, Maintenance Plan		Darren Sexton, Brian Walter	
Failures are analysed and operational/maintenance plans adjusted where necessary	2	A	High	M		✓				Root cause analysis of Electrical components. E.g. batteries	Defect Reporting Process (not implemented at Ord)	Darren Sexton	
Risk management is applied to prioritise maintenance tasks	2	A	High	W	✓					Maintenance Plan	Risk assessment form	Darren Sexton	
Maintenance costs are measured and monitored	1	A	Medium	S				✓		Budget, Monthly Reports		Darren Sexton	
7. Asset Management Information System (MIS)													
Adequate system documentation for users and IT operators	1	A	Medium	M				✓		Scada User Manual, MEX Manual, Sharepoint Manual,		Darren Sexton	

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

Input controls include appropriate verification and validation of data entered into the system	1	A	Medium	M				✓		SAP Manual Water release rules software parameter changes (document)		Darren Sexton	
Logical security access controls appear adequate, such as passwords	3	C	High	S			✓			Password history	Corporate Password Procedure	IT Administrator / Darren Sexton	
Physical security access controls appear adequate	3	C	High	M			✓			Site security contains fencing around site compound, padlocked gates, sensors on building doors, logged entry. Site is remote, benefit from further alarming minimal due to lack of surrounding infrastructure and transit time. Town office is alarmed and CCTV present.		Darren Sexton, Brian Walter	
Data backup procedures appear adequate	1	C	Low	M					✓	Scada backup in Melbourne office	Scada backup procedure	Darren Sexton, Brian Walter	Nothing for MEX
Key computations related to licensee performance reporting are materially accurate	2	C	Medium	M				✓		Performance Reports		Darren Sexton	Need to determine what performance is reported on (Kate Summers)
Management reports appear adequate for the licensee to monitor licence obligations	1	B	Low	W					✓	Licence Performance Report		Darren Sexton	
8. Risk management													
Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system	3	C	High	M			✓			Risk register, insurance risk assessment report, EMS Audit Reports, House keeping inspections	Corporate Risk Management Process, ISO 14001 EMS, H&S Procedures	Darren Sexton	
Risks are documented in a risk register and	3	C	High	M			✓			Risk register, AMP	Corporate Risk	Darren Sexton	

Pacific Hydro

Review Report for the Asset Management System Review of Ord Hydro

October 2011

The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	2	C	Medium	M				✓			Asset Management Plan and Business Plan	Strategic Asset Planning Procedure	Darren Sexton	
There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned	2	C	Medium	S				✓				Strategic Asset Planning Procedure	Darren Sexton	
12. Review of AMS														
A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current	2	C	Medium	M				✓			AMBE Report	AMBE (Asset Management Benchmarking) Process, Strategic Asset Planning Procedure	Darren Sexton	
Independent reviews (eg internal audit) are performed of the asset management system	2	A	High	M		✓					AMBE Report	AMBE (Asset Management Benchmarking) Process	Darren Sexton	