

# **Ord Hydro Pty Ltd**

## **2018 Electricity Integrated Regional Licence (EIRL4) Asset Management System Review**

### **Report**

January 2019



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15 January 2019

Dear Dharmendra

**Ord Hydro Pty Ltd: 2018 EIRL4 Asset management system review**

We have completed the 2018 EIRL Asset management system review for Ord Hydro Pty Ltd for the period 1 July 2014 to 30 June 2018 and are pleased to submit our report to you.

I confirm that this report is an accurate presentation of the findings and conclusions from our review procedures.

If you have any questions or wish to discuss anything raised in the report, please contact [REDACTED]

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Chartered Accountant  
Partner, Deloitte Risk Advisory Pty Ltd

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# 1 Independent assurance practitioner's report

## Conclusion

We have undertaken a limited assurance engagement on the effectiveness of Ord Hydro Pty Ltd's (**Ord Hydro**) Asset Management System (**AMS**), relating to its Electricity Integrated Retail Licence (EIRL4) (the **Licence**) for the period 1 July 2014 to 30 June 2018 (**review period**).

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that Ord Hydro has not established and maintained, in all material respects, an effective AMS for assets subject to the Licence, as measured by the effectiveness criteria in the April 2014 issue of the *Audit and Review Guidelines: Electricity and Gas Licences* (the **Guidelines**) issued by the Economic Regulation Authority (the **ERA**) and the systems have not operated effectively for the review period.

## Basis for conclusion

Table 3 of this report provides the effectiveness ratings for each of the 12 key processes in the asset management life-cycle assessed by this engagement. For those aspects of Ord Hydro's AMS that were assessed as having a minor opportunity for improvement, relevant observations, recommendations and action plans are summarised at section 2.4 of this report and detailed at section 4 of this report.

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

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

## Ord Hydro's responsibility for the AMS

Ord Hydro is responsible for ensuring that it has:

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

## Assurance practitioner's independence and quality control

We have complied with the independence and other relevant ethical requirements relating to assurance engagements, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

The firm applies Auditing Standard ASQC 1 *Quality Control for Firms that Perform Audits and Reviews of Financial Reports and Other Financial Information, and Other Assurance Engagements*, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

## Assurance practitioner's responsibilities

Our responsibility is to express a limited assurance conclusion on Ord Hydro's AMS for assets subject to the Licence, based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with Australian Standard on Assurance Engagements ASAE 3500 *Performance Engagements*, issued by the Australian Auditing and Assurance Standards Board, in order to express a conclusion whether, based on the procedures performed and the evidence obtained, anything has come to our attention that causes us to believe that Ord Hydro's AMS for assets subject to the Licence, have not been established and maintained, in all material respects, in accordance with the Licence as measured by the effectiveness criteria in the Guidelines. That standard requires that we plan and perform this engagement to obtain limited assurance about whether the AMS for assets subject to the Licence is materially ineffective.

A limited assurance engagement in accordance with ASAE 3500 involves identifying areas where the AMS for assets subject to the Licence is likely to be materially ineffective, addressing the areas identified and considering the process used to prepare the AMS for assets subject to the Licence. A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

### Procedures performed

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

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

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement. Accordingly, we do not express a reasonable assurance opinion on the effectiveness of Ord Hydro's AMS for assets subject to the Licence.

### Inherent Limitations

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

A limited assurance engagement relating to the period from 1 July 2014 to 30 June 2018 does not provide assurance on whether the effectiveness of Ord Hydro's AMS for assets subject to the Licence will continue in the future.

### Restricted use

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

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Chartered Accountant  
15 January 2019

## 2 Executive summary

### 2.1 Introduction and background

The Economic Regulation Authority (the **ERA**) has under the provisions of the Electricity Industry Act 2004 (the **Act**), issued to Ord Hydro Pty Ltd (**Ord Hydro**) the Electricity Integrated Retail Licence (EIRL4) (the **Licence**).

The Licence relates to Ord Hydro's generation, transmission and retail activity in relation to its operation of a 30MW hydroelectric power station located in the Kimberley Region of Western Australia. Ord Hydro supplies power via its transmission network to the Argyle Diamond Mine and Horizon Power, which then distributes and retails power to customers in the township of Kununurra.

Section 14 of the Act requires Ord Hydro to provide to the ERA an Asset Management System (**AMS**) review (the **review**) conducted by an independent expert acceptable to the ERA not less than once in every 24 month period (or any longer period that the ERA allows). The ERA set the period to be covered by the review as 1 July 2014 to 30 June 2018 (**review period**).

At the request of Ord Hydro, Deloitte Risk Advisory Pty Ltd (**Deloitte**) has undertaken a limited assurance review of Ord Hydro's AMS.

The review has been conducted in accordance with the April 2014 issue of the *Audit and Review Guidelines: Electricity and Gas Licences* (the **Guidelines**), which set out 12 key processes in the asset management life-cycle. The limited assurance review was undertaken in order to state whether, based on the procedures we have performed and the evidence we have obtained, anything has come to our attention to indicate that Ord Hydro has not established and maintained, in all material respects, an effective AMS for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines and the systems have not operated effectively for the review period.

### 2.2 Findings

In considering Ord Hydro's internal control procedures, structure and environment, its compliance arrangements and its information systems specifically relevant to those effectiveness criteria subject to review and with a focus on its electricity generation and transmission activity, we observed that Ord Hydro:

- Applies a continuous improvement approach to its asset management practices, with a number of incremental improvements introduced throughout the review period
- Otherwise maintained a stable asset management system and applied consistent asset management practices throughout the review period
- Is supported by corporate systems and functions maintained by its parent entity, Pacific Hydro
- Actioned four of the eight recommendations made by the 2014 AMS Review. The remaining four recommendations remain valid and require attention
- Needs to take corrective action in relation to the testing of its contingency plans and related training of key staff
- Has a two further of opportunities to further improve elements of its asset management practices.

This review assessed that, of the 56 elements of Ord Hydro's AMS:

- For the asset management process and policy definition adequacy ratings:
  - 48 are rated as "Adequately defined"
  - Eight are rated as "Requires some improvement".
- For the asset management performance ratings:
  - 48 are rated as "Performing effectively"
  - Two are rated as "Opportunity for improvement"
  - One is rated as "Corrective action required"
  - Five are not rated.

- There are a total of six opportunities for improvement where further action is recommended, including four outstanding items from the 2014 review.

Specific assessments for each criterion are summarised at **Table 3** in section 3 “Summary of ratings” of this report.

Detailed findings, including relevant observations, recommendations and action plans are located in section 4 “Detailed findings, recommendations and action plans” of this report.

## 2.3 Ord Hydro’s response to previous review recommendations

This review considered Ord Hydro’s progress in completing the action plans detailed in the 2014 AMS report.

Based on our examination of relevant documents, discussion with staff and consideration of the results of this review’s testing against the criteria, we determined that four of the eight action plans were fully completed during this review period. The remaining four recommendations (1/2014, 3/2014, 4/2014 and 8/2014) remain valid and require attention. Note that item 8/2014 has been superseded with item 3/2018.

Refer to section 5 of this report for further detail.

## 2.4 Recommendations and action plans

AMS Key Process and Effectiveness Criteria	Adequacy rating	Issue 1/2018
<b>Asset operations</b> <i>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</i>	Requires some improvement (B)	Although the FIXD asset register provides the base information on assets, further improvements can be made to the asset register to assist Ord Hydro to understand and manage the following aspects of its asset portfolio. We recognise that there is a cost/benefit balance to achieve in any further expansion asset records to be maintained in FIXD: <ul style="list-style-type: none"> <li>• Further description of asset type (e.g. specification, model, brand, version)</li> <li>• Asset working environment (e.g. environmental conditions)</li> <li>• Population sizes</li> <li>• Material/technology applied</li> <li>• Age (currently captured as engine hours at inspection)/remaining life/obsolescence</li> <li>• Logistics data such as lead time, availability of parts.</li> </ul>
	Performance rating	
	Opportunity for improvement (2)	
<b>Recommendation 1/2018</b> Ord Hydro include the following elements in its asset register: <ul style="list-style-type: none"> <li>• Further description of asset type</li> <li>• Asset working environment</li> <li>• Population sizes</li> <li>• Material/technology applied</li> <li>• Age/remaining life/obsolescence</li> <li>• Logistics data.</li> </ul>		<b>Action Plan 1/2018</b> Although management is of the opinion that the current asset register and associated asset management planning process is sufficient to manage Ord Hydro’s operations, consideration will be given to further enhancing the asset register as part of Pacific Hydro’s planned implementation of a new Enterprise Asset Management System (as an upgrade to the current CMMS), which will interface with SAP, maintain the equipment register, bill of materials, maintenance strategies and schedule. <b>Responsible Person</b> Manager – Group Asset Management <b>Target Date</b> December 2019

AMS Key Process and Effectiveness Criteria	Adequacy rating	Issue 2/2018
<b>Asset maintenance</b> <i>6.4 Failures are analysed and operational/maintenance plans adjusted where necessary</i>	Requires some improvement (B)	Although Ord Hydro has established and carried out procedures for analysing failures/defects, the procedure does not provide sufficient instruction and guidance as to how that analysis feeds into any appropriate review and adjustment of operations and maintenance plans, such as through the annual AMP planning workshop.
	Performance rating	
	Opportunity for improvement (2)	
<b>Recommendation 2/2018</b> Ord Hydro expand its Defects Reporting Procedure to include specific guidance on: <ul style="list-style-type: none"> <li>Assessment of consequences for past failures, including near-misses</li> <li>How operations and maintenance plans are prioritised and reviewed and adjusted by analysing past failures</li> <li>How work order information is used to feedback to the operation/maintenance plan and strategy, including documentation of conclusions and decisions, which are addressed within the annual AMP planning workshop.</li> </ul>		<b>Action Plan 2/2018</b> Although management is of the opinion that current processes around defects reporting and analysis are sufficient, this matter will be addressed in the next scheduled review of the Defects Reporting Procedure. <b>Responsible Person</b> Executive Manager - Operations <b>Target Date</b> October 2019

AMS Key Process and Effectiveness Criteria	Adequacy rating	Issue 3/2018
<b>Contingency planning</b> <i>9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks</i>	Requires some improvement (B)	During the review period, Ord Hydro has not tested its contingency plans or maintained evidence of the training required for all relevant staff in relation to the purpose and content of the plans.
	Performance rating	
	Corrective action required (3)	
<b>Recommendation 3/2018</b> Ord Hydro: <ul style="list-style-type: none"> <li>Prepare a training plan and schedule to ensure all relevant staff are sufficiently trained in the purpose and content of each contingency plan</li> <li>Schedule and carry-out testing of each contingency plan and emergency response plan.</li> </ul>		<b>Action Plan 3/2018</b> 1. A training plan for 2019 is being developed and will be completed in Q1 2019. 2. Emergency response training will be conducted in Q2 2019. <b>Responsible Person</b> Executive Manager - Operations <b>Target Date</b> June 2019

## 2.5 Scope and objectives

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

In accordance with the Guidelines, the review considered the effectiveness of Ord Hydro's existing control procedures within the following 12 key processes in the asset management life-cycle.

**Table 1 – AMS key processes and effectiveness criteria**

#	Key processes	Effectiveness criteria
1	Asset planning	<ol style="list-style-type: none"> <li>1. Asset management plan covers key requirements</li> <li>2. Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning</li> <li>3. Service levels are defined</li> <li>4. Non-asset options (e.g. demand management) are considered</li> <li>5. Lifecycle costs of owning and operating assets are assessed</li> <li>6. Funding options are evaluated</li> <li>7. Costs are justified and cost drivers identified</li> <li>8. Likelihood and consequences of asset failure are predicted</li> <li>9. Plans are regularly reviewed and updated.</li> </ol>
2	Asset creation and acquisition	<ol style="list-style-type: none"> <li>1. Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions</li> <li>2. Evaluations include all life-cycle costs</li> <li>3. Projects reflect sound engineering and business decisions</li> <li>4. Commissioning tests are documented and completed</li> <li>5. Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood.</li> </ol>
3	Asset disposal	<ol style="list-style-type: none"> <li>1. Under-utilised and under-performing assets are identified as part of a regular systematic review process</li> <li>2. The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken</li> <li>3. Disposal alternatives are evaluated</li> <li>4. There is a replacement strategy for assets.</li> </ol>
4	Environmental analysis (all external factors that affect the system)	<ol style="list-style-type: none"> <li>1. Opportunities and threats in the system environment are assessed</li> <li>2. Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved</li> <li>3. Compliance with statutory and regulatory requirements</li> <li>4. Achievement of customer service levels.</li> </ol>
5	Asset operations	<ol style="list-style-type: none"> <li>1. Operational policies and procedures are documented and linked to service levels required</li> <li>2. Risk management is applied to prioritise operations tasks</li> <li>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</li> <li>4. Operational costs are measured and monitored</li> <li>5. Staff resources are adequate and staff receive training commensurate with their responsibilities.</li> </ol>

#	Key processes	Effectiveness criteria
6	Asset maintenance	<ol style="list-style-type: none"> <li>1. Maintenance policies and procedures are documented and linked to service levels required</li> <li>2. Regular inspections are undertaken of asset performance and condition</li> <li>3. Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule</li> <li>4. Failures are analysed and operational/maintenance plans adjusted where necessary</li> <li>5. Risk management is applied to prioritise maintenance tasks</li> <li>6. Maintenance costs are measured and monitored.</li> </ol>
7	Asset management information system	<ol style="list-style-type: none"> <li>1. Adequate system documentation exists for users and IT operators</li> <li>2. Input controls include appropriate verification and validation of data entered into the system</li> <li>3. Logical security access controls appear adequate, such as passwords</li> <li>4. Physical security access controls appear adequate</li> <li>5. Data backup procedures appear adequate and backups are tested</li> <li>6. Key computations related to licensee performance reporting are materially accurate</li> <li>7. Management reports appear adequate for the licensee to monitor licence obligations.</li> </ol>
8	Risk management	<ol style="list-style-type: none"> <li>1. Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the AMS</li> <li>2. Risks are documented in a risk register and treatment plans are actioned and monitored</li> <li>3. The probability and consequences of asset failure are regularly assessed.</li> </ol>
9	Contingency planning	<ol style="list-style-type: none"> <li>1. Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.</li> </ol>
10	Financial planning	<ol style="list-style-type: none"> <li>1. The financial plan states the financial objectives and strategies and actions to achieve the objectives</li> <li>2. The financial plan identifies the source of funds for capital expenditure and recurrent costs</li> <li>3. The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)</li> <li>4. The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period</li> <li>5. The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services</li> <li>6. Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary.</li> </ol>
11	Capital expenditure planning	<ol style="list-style-type: none"> <li>1. There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates</li> <li>2. The plan provides reasons for capital expenditure and timing of expenditure</li> <li>3. The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan</li> <li>4. There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned.</li> </ol>

#	Key processes	Effectiveness criteria
12	Review of AMS	<ol style="list-style-type: none"> <li>1. A review process is in place to ensure that the asset management plan and the AMS described therein are kept current</li> <li>2. Independent reviews (e.g. internal audit) are performed of the AMS.</li> </ol>

Each key process and effectiveness criterion is applicable to Ord Hydro's Licence and as such was individually considered as part of the review. The Review Plan, set out at Appendix A, details the risk assessments made for and review priority assigned to each key process and effectiveness criterion.

## 2.6 Approach

Our approach for this review involved the following activities, which were undertaken during August to October 2018:

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

### 3 Summary of ratings

In accordance with the Guidelines, the assessment of both the process and policy definition adequacy rating (refer to **Table 1**) and the performance rating (refer to **Table 2**) for each of the key AMS processes is performed using the below ratings.

For the avoidance of doubt, these ratings do not provide reasonable assurance.

**Table 1: Asset management process and policy definition adequacy ratings**

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

**Table 2: Asset management performance ratings**

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

This report provides:

- A breakdown of each function of the AMS into sub-components as described in the Guidelines. This approach is taken to enable a more thorough review of key processes where individual components within a larger process can be of greater risk to the business therefore requiring different review treatment
- A summary of the ratings applied by the review (**Table 3**) for each of:
  - Asset management process and policy definition adequacy (**definition adequacy rating**)
  - Asset management performance (**performance rating**).
- Detailed findings, including relevant observations, recommendations and action plans (**Section 4**). Descriptions of the effectiveness criteria can be found in section 4 and the Review Plan at Appendix A.

**Table 3: AMS effectiveness summary**

Ref	Effectiveness criteria	Review Priority	Ratings	
			Definition Adequacy	Performance
<b>1.</b>	<b>Asset planning</b>		<b>A</b>	<b>1</b>
1.1	Asset management plan covers key requirements	Priority 4	A	1
1.2	Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	Priority 5	A	1
1.3	Service levels are defined	Priority 4	A	1
1.4	Non-asset options (e.g. demand management) are considered	Priority 3	B	NR
1.5	Lifecycle costs of owning and operating assets are assessed	Priority 4	A	1
1.6	Funding options are evaluated	Priority 5	A	1
1.7	Costs are justified and cost drivers identified	Priority 4	A	1
1.8	Likelihood and consequences of asset failure are predicted	Priority 2	A	1
1.9	Plans are regularly reviewed and updated	Priority 5	A	1
<b>2.</b>	<b>Asset creation and acquisition</b>		<b>A</b>	<b>1</b>
2.1	Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions	Priority 4	A	1
2.2	Evaluations include all life-cycle costs	Priority 4	A	1
2.3	Projects reflect sound engineering and business decisions	Priority 4	A	1
2.4	Commissioning tests are documented and completed	Priority 4	A	1
2.5	Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood	Priority 2	A	1
<b>3.</b>	<b>Asset disposal</b>		<b>B</b>	<b>NR</b>
3.1	Under-utilised and under-performing assets are identified as part of a regular systematic review process	Priority 4	B	NR
3.2	The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	Priority 4	B	NR
3.3	Disposal alternatives are evaluated	Priority 5	B	NR
3.4	There is a replacement strategy for assets	Priority 4	B	NR
<b>4.</b>	<b>Environmental analysis</b>		<b>A</b>	<b>1</b>
4.1	Opportunities and threats in the system environment are assessed	Priority 4	A	1
4.2	Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	Priority 4	A	1
4.3	Compliance with statutory and regulatory requirements	Priority 4	A	1
4.4	Achievement of customer service levels	Priority 4	A	1
<b>5.</b>	<b>Asset operations</b>		<b>A</b>	<b>1</b>
5.1	Operational policies and procedures are documented and linked to service levels required	Priority 4	A	1

Ref	Effectiveness criteria	Review Priority	Ratings	
			Definition Adequacy	Performance
5.2	Risk management is applied to prioritise operations tasks	Priority 3	A	1
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	Priority 4	B	2
5.4	Operational costs are measured and monitored	Priority 4	A	1
5.5	Staff resources are adequate and staff receive training commensurate with their responsibilities	Priority 4	A	1
<b>6. Asset maintenance</b>			<b>A</b>	<b>1</b>
6.1	Maintenance policies and procedures are documented and linked to service levels required	Priority 2	A	1
6.2	Regular inspections are undertaken of asset performance and condition	Priority 2	A	1
6.3	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	Priority 2	A	1
6.4	Failures are analysed and operational/maintenance plans adjusted where necessary	Priority 2	B	2
6.5	Risk management is applied to prioritise maintenance tasks	Priority 1	A	1
6.6	Maintenance costs are measured and monitored	Priority 4	A	1
<b>7. Asset management information system</b>			<b>A</b>	<b>1</b>
7.1	Adequate system documentation exists for users and IT operators	Priority 5	A	1
7.2	Input controls include appropriate verification and validation of data entered into the system	Priority 4	A	1
7.3	Logical security access controls appear adequate, such as passwords	Priority 5	A	1
7.4	Physical security access controls appear adequate	Priority 5	A	1
7.5	Data backup procedures appear adequate and backups are tested	Priority 4	A	1
7.6	Key computations related to licensee performance reporting are materially accurate	Priority 5	A	1
7.7	Management reports appear adequate for the licensee to monitor licence obligations	Priority 5	A	1
<b>8. Risk management</b>			<b>A</b>	<b>1</b>
8.1	Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the AMS	Priority 2	A	1
8.2	Risks are documented in a risk register and treatment plans are actioned and monitored	Priority 4	A	1
8.3	The probability and consequences of asset failure are regularly assessed	Priority 2	A	1
<b>9. Contingency planning</b>			<b>B</b>	<b>3</b>
9.1	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	Priority 2	B	3
<b>10. Financial planning</b>			<b>A</b>	<b>1</b>
10.1	The financial plan states the financial objectives and strategies and actions to achieve the objectives	Priority 4	A	1
10.2	The financial plan identifies the source of funds for capital expenditure and recurrent costs	Priority 5	A	1
10.3	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	Priority 5	A	1
10.4	The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period	Priority 5	A	1
10.5	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	Priority 4	A	1
10.6	Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary	Priority 4	A	1
<b>11. Capital expenditure planning</b>			<b>A</b>	<b>1</b>
11.1	There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates	Priority 4	A	1

Ref	Effectiveness criteria	Review Priority	Ratings	
			Definition Adequacy	Performance
11.2	The plan provides reasons for capital expenditure and timing of expenditure	Priority 5	A	1
11.3	The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	Priority 4	A	1
11.4	There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned	Priority 5	A	1
<b>12. Review of AMS</b>			<b>A</b>	<b>1</b>
12.1	A review process is in place to ensure that the asset management plan and the AMS described therein are kept current	Priority 5	A	1
12.2	Independent reviews (e.g. internal audit) are performed of the AMS	Priority 5	A	1

## 4 Detailed findings, recommendations and action plans

The following tables contain:

- *Findings*: the reviewer's understanding of the process and any issues that have been identified during the review
- *Recommendations (where applicable)*: recommendations for improvement or enhancement of the process or control
- *Action plans (where applicable)*: Ord Hydro's formal response to review recommendations, providing details of action to be implemented to address the specific issue raised by the review.

## 4.1 Asset Planning

**Key process:** Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price)

**Expected outcome:** Integration of asset strategies into operational or business plans will establish a framework for existing and new assets to be effectively utilised and their service potential optimised

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

Effectiveness Criteria	Findings	
1.1 Asset Management Plan covers key requirements	<p>Through discussion with the Asset Engineering Manager and Manager Risk and Assurance, and inspection of Ord Hydro's Asset Management Plans (<b>AMP</b>) for 2014, 2015, 2016 and 2017, we determined that the AMP:</p> <ul style="list-style-type: none"> <li>Provides an overview on the whole life cycle of the Ord Hydro power plant and transmission network, covering those aspects that ensure the achievement of the business objectives for the assets, including safety of personnel and contractors, maximising commercial output and maintenance of acceptable conditions and risk profile</li> <li>Is updated on an annual basis, with each new version being finalised in approximately September each year</li> <li>Includes the following elements: <ul style="list-style-type: none"> <li>Asset overview, including description of operations and assets</li> <li>Lifecycle overview, including milestones and end of life</li> <li>Current business objectives</li> <li>Lifecycle performance, including performance charts, historical performance, forecast performance, forecast cost, major changes to cost forecast and health and safety</li> <li>Asset performance, including cost performance indicators, condition assessment, operational risk summary</li> <li>Major works, including significant scheduled maintenance and refurbishment plan and opportunities.</li> </ul> </li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
1.2 Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	<p>Through discussion with the Asset Engineering Manager and Manager Risk and Assurance, and inspection of Ord Hydro's AMPs, business planning records and power purchase agreements (PPA) with its customers, we determined that Ord Hydro has maintained an annual business planning process where the:</p> <ul style="list-style-type: none"> <li>Commercial objectives (revenue, expenditure and profitability) of its asset operations is analysed</li> <li>Needs of its customers is accommodated.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
1.3 Service levels are defined	<p>Through discussion with the Asset Engineering Manager and inspection of Ord Hydro's AMP and PPAs with its customers, we determined that:</p> <ul style="list-style-type: none"> <li>The two PPAs outline the service levels required</li> <li>The AMP reflects those required service levels.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

Effectiveness Criteria	Findings		
1.4 Non-asset options (e.g. demand management) are considered	<p>Through discussion with the Asset Engineering Manager, examination of the AMP and supporting asset life cycle model spreadsheets, and consideration of Ord Hydro's asset planning processes, we determined that:</p> <ul style="list-style-type: none"> <li>• During the review period, Ord Hydro's operating strategy and contractual arrangements had not triggered a need for non-asset options to be considered in planning for modifications to assets</li> <li>• Ord Hydro has not yet established a formal process or procedure for considering non-asset options</li> <li>• This matter was raised at item 1/2014 in the AMS review report, however the relevant action plan had not been implemented during the review period.</li> </ul> <p>Item 1/2014 at section 5 of this report outlines the updated action plan for closing out this matter.</p> <table border="1"> <tr> <td><b>Adequacy Rating:</b> Requires some improvement (B)</td><td><b>Performance Rating:</b> Not Rated</td></tr> </table>	<b>Adequacy Rating:</b> Requires some improvement (B)	<b>Performance Rating:</b> Not Rated
<b>Adequacy Rating:</b> Requires some improvement (B)	<b>Performance Rating:</b> Not Rated		
1.5 Lifecycle costs of owning and operating assets are assessed	<p>Through discussion with the Asset Engineering Manager, examination of Ord Hydro's 2014, 2015, 2016 and 2017 AMPs and examination of the supporting asset life cycle model spreadsheets, we determined that Ord Hydro has consistently forecast and assessed the lifecycle cost of owning and operating the power plant and transmission network assets until the 2036 financial year.</p> <table border="1"> <tr> <td><b>Adequacy Rating:</b> Adequately defined (A)</td><td><b>Performance Rating:</b> Performing effectively (1)</td></tr> </table>	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)		
1.6 Funding options are evaluated	<p>Through discussion with the Asset Engineering Manager and inspection of relevant documentation, we determined that Ord Hydro applies an annual bottom up budgeting process, providing for analysis of the funding options available for the financial year ahead.</p> <table border="1"> <tr> <td><b>Adequacy Rating:</b> Adequately defined (A)</td><td><b>Performance Rating:</b> Performing effectively (1)</td></tr> </table>	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)		
1.7 Costs are justified and cost drivers identified	<p>Through discussion with the Asset Engineering Manager and inspection of relevant documentation, we determined that the 2018 annual budget for Ord Hydro's operations identifies both capital expenditure and operating costs, with justifications provided for each cost category within the budget.</p> <table border="1"> <tr> <td><b>Adequacy Rating:</b> Adequately defined (A)</td><td><b>Performance Rating:</b> Performing effectively (1)</td></tr> </table>	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)		

Effectiveness Criteria	Findings
1.8 Likelihood and consequences of asset failure are predicted	<p>Through discussion with Asset Engineering Manager and Manager Risk and Assurance, consideration of Ord Hydro's processes for predicting the likelihood and consequence of power plant and transmission network asset failure, and examination of relevant risk assessment and asset planning documentation in support of each of the 2014, 2015, 2016 and 2017 AMPs, we determined that:</p> <ul style="list-style-type: none"> <li>• Ord Hydro has implemented an Asset Integrity Management System (AIMS) program, which: <ul style="list-style-type: none"> <li>• Identifies critical assets</li> <li>• Uses internal and external assessments to assess likelihood and consequences of asset failure</li> <li>• Plans and implements mitigations for identified risks/consequences</li> </ul> </li> <li>• Technical asset integrity assessments completed during the review period included: <ul style="list-style-type: none"> <li>• Main transformer condition assessment</li> <li>• Review of mechanical protection and controls arrangements (considering potential hidden failures and risks)</li> <li>• Generator condition assessments</li> </ul> </li> <li>• A defects reporting procedure was implemented in 2016, outlining procedures required to assess risks (including likelihood and consequence of asset failure) associated with defects.</li> </ul> <p><b>Adequacy Rating:</b> Adequately defined (A)      <b>Performance Rating:</b> Performing effectively (1)</p>
1.9 Plans are regularly reviewed and updated	<p>Ord Hydro's AMP was updated on an annual basis throughout the review period, with each new version being finalised in approximately September each year.</p> <p><b>Adequacy Rating:</b> Adequately defined (A)      <b>Performance Rating:</b> Performing effectively (1)</p>

## 4.2 Asset Creation and acquisition

**Key process:** 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

**Expected outcome:** A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery.

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

Effectiveness Criteria	Findings	
2.1 Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions	<p>Through discussion with the Asset Engineering Manager, and inspection of relevant documentation, we determined that:</p> <ul style="list-style-type: none"> <li>• Ord Hydro applies its corporate capital expenditure (Capex) business case process for new asset creation</li> <li>• Capex business cases require strategic justification/rationale, alignment with the AMP, budget and financial analysis and risk analysis</li> <li>• Capex evaluations within the review period included evaluations for asset refurbishments and upgrades, plus addition of new circuit breakers</li> <li>• As Ord Hydro's operations do not contemplate non-asset solutions, comparative assessments are not made.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
2.2 Evaluations include all life-cycle costs	<p>Through discussion with the Asset Engineering Manager and inspection of relevant documentation, we determined that Ord Hydro's:</p> <ul style="list-style-type: none"> <li>• Business planning process analyses and forecasts the lifecycle cost of owning and operating assets until FY2036</li> <li>• Capex business case process provides for evaluation of all life-cycle costs.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
2.3 Projects reflect sound engineering and business decisions	<p>Through discussion with the Asset Engineering Manager and inspection of relevant documentation, we determined that Ord Hydro's capex process provides for both engineering and commercial input into asset refurbishment and upgrade projects.</p>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
2.4 Commissioning tests are documented and completed	<p>Through discussion with the Asset Engineering Manager and inspection of relevant documentation, we determined that of Ord Hydro's Capex process provides for commissioning tests to be documented and authorised by relevant management.</p>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
2.5 Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood	<p>Through discussion with the Asset Engineering Manager and Manager Risk and Assurance, and inspection of Ord Hydro's 2014, 2015, 2016 and 2017 AMPs and risk registers, we determined that Ord Hydro's understanding and assignment of the ongoing legal, environmental and safety obligations of the power plant and transmission network assets is reflected in the results of risk assessments performed as part of its annual asset management planning process.</p> <p><i>Refer to section 1.8 above for further detail on the processes in place to demonstrate Ord Hydro's understanding of its legal, environmental and safety obligations in operating the power plant and transmission network.</i></p>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

### 4.3 Asset disposal

**Key process:** 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.

**Expected outcome:** Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.

**Overall Adequacy/Performance rating:** Requires some improvement (B) / Not rated

Effectiveness Criteria	Findings	
3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process	<p>Through discussions with the Asset Engineering Manager, examination of Ord Hydro's asset register, we determined that during the review period:</p> <ul style="list-style-type: none"> <li>Ord Hydro did not dispose of any of its power plant and transmission network assets due to assets being surplus, under-performing or unserviceable</li> <li>Replacement of asset components were due to condition, wear and tear and obsolescence identified through asset planning and condition monitoring</li> <li>Ord Hydro had not established a formal process or procedure for assessing asset disposal due to under utilisation or under performance. This matter was raised at item 3/2014 in the AMS review report, however the relevant action plan had not been implemented. We recognise that Ord Hydro considers that an asset disposal process has not been required due to its power plant and transmission network assets being in the mid-phase of its asset lifecycle (assessed to be in excess of 50 years). Item 3/2014 at section 5 of this report outlines the updated action plan for closing out this matter.</li> </ul>	
3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken		
3.3 Disposal alternatives are evaluated		
3.4 There is a replacement strategy for assets		
	<b>Adequacy Rating:</b> Requires some improvement (B)	<b>Performance Rating:</b> Not Rated

## 4.4 Environmental analysis

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

**Expected outcome:** The AMS regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements.

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

Effectiveness Criteria	Findings	
4.1 Opportunities and threats in the system environment are assessed	<p>Through discussion with the Asset Engineering Manager and Manager Risk and Assurance, and inspection of relevant documentation, we determined that during the review period:</p> <ul style="list-style-type: none"> <li>Ord Hydro performed annual risk assessments, which <ul style="list-style-type: none"> <li>Assessed the opportunities and threats in the system environment for the safe operation of the power plant and network assets</li> <li>For each threat, assessed and predicted the consequences (on people, environment and supply of electricity) and likelihood of the occurrence of the threat for safe generation and delivery of electricity. Opportunities for improvement or prevention had been listed as part of controls within the risk assessment</li> </ul> </li> <li>Opportunities and threats in the system environment, have been assessed at a corporate level by Pacific Hydro management on a quarterly basis</li> <li>The assessment of corporate risk for the Ord Hydro business, which includes the power plant and transmission network are recorded in the Ord Hydro Risk Wizard Risk Register.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
4.2 Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	<p>Through discussion with the Asset Engineering Manager and Ord Hydro Manager, examination of Ord Hydro's AMPs, customer PPAs and examples of relevant reports, and consideration of Ord Hydro's performance reporting activities, we determined that Ord Hydro has:</p> <ul style="list-style-type: none"> <li>Developed performance standards for its power plant and transmission network assets including net generation, availability, quality and reliability of supply</li> <li>Regularly monitored and reported on its performance against those standards throughout the review period</li> <li>Prepared an Annual Reconciliation of its achievement of performance requirements contained in its PPA with Horizon Power.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
4.3 Compliance with statutory and regulatory requirements	<p>Through discussion with the Asset Engineering Manager and Manager Risk and Assurance, and examination of Ord Hydro's obligation register, AMPs and supporting documentation, we determined that:</p> <ul style="list-style-type: none"> <li>Applicable statutory and regulatory requirements have been captured in Ord Hydro's Risk Wizard risk system</li> <li>Throughout the review period, Ord Hydro demonstrated an awareness of and compliance with its statutory and regulatory requirements through the development of its annual asset management plans and annual reporting to the ERA.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

Effectiveness Criteria	Findings
4.4 Achievement of customer service levels	<p>Through discussion with the Asset Engineering Manager and Ord Hydro Manager, examination of Ord Hydro's AMPs, customer PPAs and examples of relevant reports, and consideration of Ord Hydro's performance reporting activities, we determined that Ord Hydro has:</p> <ul style="list-style-type: none"> <li>• Through its customer PPAs, established customer service levels</li> <li>• Regularly monitored and reported on its performance against those service levels throughout the review period</li> <li>• Prepared an Annual Reconciliation of its achievement of performance requirements contained in its PPA with Horizon Power.</li> </ul>
	<div> <div><b>Adequacy Rating:</b> Adequately defined (A)</div> <div><b>Performance Rating:</b> Performing effectively (1)</div> </div>

## 4.5 Asset operations

**Key process:** Operational functions relate to the day-to-day running of assets and directly affect service levels and costs.

**Expected outcome:** Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.

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

Effectiveness Criteria	Findings	
5.1 Operational policies and procedures are documented and linked to service levels required	<p>Through discussion with the Site Manager and Asset Engineering Manager, inspection of relevant documentation and visit to Ord Hydro's Kununurra operations, we determined that:</p> <ul style="list-style-type: none"> <li>• Ord Hydro has developed the following key documents, which make up its operational policies and procedures relevant to its power generation and transmission network assets:</li> <li>• AMP, which details business objectives, performance measures and operational risks covering HSE, resource, operations and maintenance</li> <li>• Contingency Plan Procedures</li> <li>• OEM operating manuals and procedures</li> <li>• Ord Hydro's customer PPAs outline required service levels</li> <li>• Collectively, these documents address the key elements of Ord Hydro's operation of its power generation and transmission network assets in accordance with required service levels.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
5.2 Risk management is applied to prioritise operations tasks	<p>Through discussion with Asset Engineering Manager, Manager Risk and Assurance and Site Manager, consideration of Ord Hydro's risk management practices, examination of relevant risk assessment material, and visit to Ord Hydro's Kununurra operations, we determined that:</p> <ul style="list-style-type: none"> <li>• Ord Hydro's AMP summarises key site and operational risks/issues including activities for maintaining effective control over any potentially negative impacts of operations</li> <li>• Ord Hydro utilises the AIMS program to identify critical assets, assess likelihood and consequences of asset failure and prioritise, plan and implement mitigations for identified risks/consequences</li> <li>• A defects reporting procedure was implemented in 2016, outlining procedures required to assess risks associated with defects</li> <li>• Each of Ord Hydro's refurbishment projects are prioritised in accordance with the condition and risk assessments detailed in the AMP</li> <li>• In allocating resources to operations tasks, Ord Hydro's site staff are empowered to apply prioritisation based on their understanding of operational risks.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

Effectiveness Criteria	Findings				
<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>Through discussion with the Site Manager and Asset Engineering Manager, inspection of relevant documentation and visit to Ord Hydro's Kununurra operations, we determined that:</p> <ul style="list-style-type: none"> <li>• In FY18, Ord Hydro upgraded its asset and works management Computerised Maintenance Management System (CMMS) from WTG to FIXD</li> <li>• Ord Hydro utilises the FIXD system as its asset register for all generation and network assets. The system includes provision for information relating to: <ul style="list-style-type: none"> <li>• Asset group and accounting class</li> <li>• Asset location/installation date</li> <li>• Asset health</li> <li>• Serial number</li> </ul> </li> <li>• Ord Hydro also maintains asset accounting information within its SAP asset register</li> <li>• Although the FIXD asset register provides the base information on assets, further improvements can be made to the asset register to assist Ord Hydro to understand and manage the following aspects of its asset portfolio. We recognise that there is a cost/benefit balance to achieve in any further expansion asset records to be maintained in FIXD: <ul style="list-style-type: none"> <li>• Further description of asset type (e.g. specification, model, brand, version)</li> <li>• Asset working environment (e.g. environmental conditions)</li> <li>• Population sizes</li> <li>• Material/technology applied</li> <li>• Age (currently captured as engine hours at inspection)/remaining life/obsolescence</li> <li>• Logistics data such as lead time, availability of parts.</li> </ul> </li> </ul> <table border="1"> <tr> <td><b>Adequacy Rating:</b> Requires some improvement (B)</td><td><b>Performance Rating:</b> Opportunity for improvement (2)</td></tr> <tr> <td> <p><b>Recommendation 1/2018</b></p> <p>Ord Hydro include the following elements in its asset register:</p> <ul style="list-style-type: none"> <li>• Further description of asset type</li> <li>• Asset working environment</li> <li>• Population sizes</li> <li>• Material/technology applied</li> <li>• Age/remaining life/obsolescence</li> <li>• Logistics data.</li> </ul> </td><td> <p><b>Action Plan 1/2018</b></p> <p>Although management is of the opinion that the current asset register and associated asset management planning process is sufficient to manage Ord Hydro's operations, consideration will be given to further enhancing the asset register as part of Pacific Hydro's planned implementation of a new Enterprise Asset Management System (as an upgrade to the current CMMS), which will interface with SAP, maintain the equipment register, bill of materials, maintenance strategies and schedule.</p> <p><b>Responsible Person</b> Manager – Group Asset Management</p> <p><b>Target Date</b> December 2019</p> </td></tr> </table>	<b>Adequacy Rating:</b> Requires some improvement (B)	<b>Performance Rating:</b> Opportunity for improvement (2)	<p><b>Recommendation 1/2018</b></p> <p>Ord Hydro include the following elements in its asset register:</p> <ul style="list-style-type: none"> <li>• Further description of asset type</li> <li>• Asset working environment</li> <li>• Population sizes</li> <li>• Material/technology applied</li> <li>• Age/remaining life/obsolescence</li> <li>• Logistics data.</li> </ul>	<p><b>Action Plan 1/2018</b></p> <p>Although management is of the opinion that the current asset register and associated asset management planning process is sufficient to manage Ord Hydro's operations, consideration will be given to further enhancing the asset register as part of Pacific Hydro's planned implementation of a new Enterprise Asset Management System (as an upgrade to the current CMMS), which will interface with SAP, maintain the equipment register, bill of materials, maintenance strategies and schedule.</p> <p><b>Responsible Person</b> Manager – Group Asset Management</p> <p><b>Target Date</b> December 2019</p>
<b>Adequacy Rating:</b> Requires some improvement (B)	<b>Performance Rating:</b> Opportunity for improvement (2)				
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Effectiveness Criteria	Findings	
5.4 Operational costs are measured and monitored	Through discussion with the Site Manager and Asset Engineering Manager, and inspection of relevant documentation, we determined that Ord Hydro measures and monitors operational expenditure (including variations to budget) through its monthly generation report and detailed monthly profit centre report.	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
5.5 Staff receive training commensurate with their responsibilities	<p>Through discussion with the Site Manager and Asset Engineering Manager, inspection of relevant documentation and visit to Ord Hydro's Kununurra operations, we:</p> <ul style="list-style-type: none"> <li>• Determined that Ord Hydro utilises the following documents to manage staff training:</li> <li>• Maintenance Management Procedure, which specifies minimum qualifications, training and experience for operations and maintenance activities</li> <li>• Site records of qualifications for staff and contractors such as certifications</li> <li>• Site records of performed training courses</li> <li>• Sighted occasions of training provided to staff and contractors, including confined space safety procedures, refresher training (five to six year intervals) on HV switching operations and maintenance, and regular training on transmission power line operations and maintenance.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

## 4.6 Asset maintenance

**Key process:** Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.

**Expected outcome:** Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.

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

Effectiveness Criteria	Findings
6.1 Maintenance policies and procedures are documented and linked to service levels required	<p>Through discussion with the Site Manager and Asset Engineering Manager, examination of relevant documentation and visit to Ord Hydro's Kununurra operations, we determined that:</p> <ul style="list-style-type: none"> <li>• Ord Hydro has developed the following key documents, which make up its operational policies and procedures relevant to its power generation and transmission network assets:</li> <li>• AMP, which details asset business objectives, lifecycle overview, asset condition, performance measures, and major works, including significant scheduled maintenance and refurbishment plan and opportunities</li> <li>• Maintenance Management Procedure, which outlines minimum maintenance requirements (including performance monitoring) and provides guidance in establishing and maintaining safety requirements and annual works programs</li> <li>• Maintenance plans and procedures</li> <li>• Outage plans and schedules</li> <li>• Contingency plan procedures</li> <li>• Defects reporting procedure</li> <li>• OEM operating manuals and procedures, including modules relating to: <ul style="list-style-type: none"> <li>• Generator maintenance</li> <li>• Safety - substations and switchyards</li> <li>• Generator excitation</li> <li>• Disconnectors and earth switches</li> <li>• Switchgear</li> <li>• Transformers</li> </ul> </li> <li>• Ord Hydro's customer PPAs outline required service levels.</li> </ul> <p>Collectively, these documents address the key elements of Ord Hydro's maintenance of its power generation and transmission network assets in accordance with required service levels.</p>
	<p><b>Adequacy Rating:</b> Adequately defined (A)</p> <p><b>Performance Rating:</b> Performing effectively (1)</p>

Effectiveness Criteria	Findings
6.2 Regular inspections are undertaken of asset performance and condition	<p>Through discussion with the Site Manager and Asset Engineering Manager, examination of relevant documentation and visit to Ord Hydro's Kununurra operations, we:</p> <ul style="list-style-type: none"> <li>Determined that: <ul style="list-style-type: none"> <li>Ord Hydro has implemented a structured process for regularly inspecting the performance and condition of its generation and transmission network assets. This process is reflected within Ord Hydro Maintenance Management Procedure and associated maintenance plan and outage plans and schedules, which are then implemented within the FIXD asset and works management system</li> <li>Throughout the review period, inspections were undertaken as scheduled and recorded within the FIXD asset and works management system</li> </ul> </li> <li>Confirmed site personnel awareness and understanding of asset condition assessments contained in the AMP</li> <li>Sighted evidence of the following: <ul style="list-style-type: none"> <li>Completion of scheduled inspections of diesel deluge fire pump (six monthly), diesel generators (3 monthly), compressors (6 monthly), turbines, transmission line, switchyards and battery chargers</li> <li>Scheduled condition inspection performed by an independent expert on Ord Hydro's Unit B, with the results leading to refurbishment works being planned and completed in June 2017</li> <li>Targeted power pole foundation condition inspection undertaken in September 2017.</li> </ul> </li> </ul> <p><b>Adequacy Rating:</b> Adequately defined (A)      <b>Performance Rating:</b> Performing effectively (1)</p>
6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	<p>Through discussion with the Site Manager and Asset Engineering Manager, inspection of relevant documentation and visit to Ord Hydro's Kununurra operations, we:</p> <ul style="list-style-type: none"> <li>Determined that: <ul style="list-style-type: none"> <li>Ord Hydro's Asset Maintenance Plan outlines major asset maintenance works in terms of scheduled (preventative and corrective) maintenance requirements, as well as refurbishment plans. The Asset Maintenance Plan details the 17 most significant maintenance activities</li> <li>The Maintenance Management Procedure provides governance on maintenance compliance by specifying tolerances on specific maintenance item/tasks for approval on extension or waiver</li> <li>Work schedules are programmed into the FIXD asset and works management system, which enables work orders to be auto-generated by the system</li> <li>The number of unscheduled (emergency and corrective) maintenance tasks are relatively small (6% of maintenance work undertaken between January 2016 and June 2018 was unplanned)</li> <li>The FIXD asset and works management system records the completion of work orders against scheduled timeframes and enables rescheduling of work orders where necessary and within the allowable tolerances</li> <li>Where work orders have been rescheduled, site personnel apply engineering judgment and provide justification for the alternative arrangements made. Note that priority items (e.g. critical equipment) require immediate action</li> <li>Current site personnel have considerable experience in maintaining Ord Hydro's generation and network assets, enabling work orders to be appropriately prioritised and completed within schedule and allowable tolerances</li> </ul> </li> </ul>

Effectiveness Criteria	Findings	
	<ul style="list-style-type: none"> <li>During the review period, Ord Hydro reported that it had completed all work orders within schedule or allowable tolerances. In instances where the initial work schedule was not met, Ord Hydro had followed its procedures for authorising amendments to work schedules</li> <li>Confirmed site personnel acceptance of asset maintenance plans and schedules to be appropriate and achievable</li> <li>Sighted evidence of work order completion in accordance with work schedules.</li> </ul>	
6.4 Failures are analysed and operational/maintenance plans adjusted where necessary	<b>Adequacy Rating:</b> Adequately defined (A)	
	<b>Performance Rating:</b> Performing effectively (1)	
	<p>Through discussion with the Site Manager and Asset Engineering Manager, inspection of relevant documentation and visit to Ord Hydro's Kununurra operations, we:</p> <ul style="list-style-type: none"> <li>Determined that: <ul style="list-style-type: none"> <li>Ord Hydro has established a mechanism for managing asset defects/failures through its Defect Reporting Procedure, which provides guidelines for managing defects in accordance with Ord Hydro's risk management framework and delegation of authority procedure</li> <li>The Defects Reporting Procedure enables Ord Hydro to assess and respond to defects and failures, including analysis of those failures (e.g. necessary root cause analysis) and provision of conclusions or recommendations on changes in operational/maintenance plans</li> <li>Information gathered through resulting investigations and assessments is fed into the annual AMP planning workshop and ultimately, the AMP</li> </ul> </li> <li>Sighted evidence of assessment, investigation and response to the following failures by the Asset Engineering team and OEM contractor: <ul style="list-style-type: none"> <li>Turbine cracks</li> <li>Relay replacement</li> </ul> </li> <li>Observed that unplanned outages that occurred throughout the review period were mostly caused by lightning strikes (e.g. nine in 2017 and one in 2018), with the resulting response executed in a manner which did not cause significant down time.</li> </ul> <p>Although Ord Hydro has established and carried out procedures for analysing failures/defects, the procedure does not provide sufficient instruction and guidance as to how that analysis feeds into any appropriate review and adjustment of operations and maintenance plans, such as through the annual AMP planning workshop.</p>	
	<b>Adequacy Rating:</b> Requires some improvement (B)	
	<b>Performance Rating:</b> Opportunity for improvement (2)	
	<p><b>Recommendation 2/2018</b></p> <p>Ord Hydro expand its Defects Reporting Procedure to include specific guidance on:</p> <ul style="list-style-type: none"> <li>Assessment of consequences for past failures, including near-misses</li> <li>How operations and maintenance plans are prioritised and reviewed and adjusted by analysing past failures</li> </ul>	<p><b>Action Plan 2/2018</b></p> <p>Although management is of the opinion that current processes around defects reporting and analysis are sufficient, this matter will be addressed in the next scheduled review of the Defects Reporting Procedure.</p> <p><b>Responsible Person</b> Executive Manager - Operations</p>

Effectiveness Criteria		Findings
	<ul style="list-style-type: none"> <li>How work order information is used to feedback to the operation/maintenance plan and strategy, including documentation of conclusions and decisions, which are addressed within the annual AMP planning workshop.</li> </ul>	<b>Target Date</b> October 2019
6.5 Risk management is applied to prioritise maintenance tasks	<p>Through discussion with Asset Engineering Manager, Manager Risk and Assurance and Site Manager, consideration of Ord Hydro's risk management practices, visit to Ord Hydro's Kununurra operations and examination of relevant asset planning, assessment and works management material, we:</p> <ul style="list-style-type: none"> <li>Determined that Ord Hydro has applied the following processes and references to enable maintenance tasks to be prioritised:</li> <li>The AMP summarises significant scheduled maintenance planned as a result of risk based assessment and planning</li> <li>The Maintenance Management Procedure specifies minimum maintenance conditions, safety critical systems/items, statutory work and allowable tolerances for completion of scheduled maintenance</li> <li>The AIMS program is used to identify critical assets, assess asset risks and prioritise, plan and implement mitigations for identified risks/consequences</li> <li>The defects reporting procedure implemented in 2016, provides guidelines for managing defects in accordance with Ord Hydro's risk management framework and delegation of authority procedure</li> <li>Each of Ord Hydro's refurbishment projects are prioritised in accordance with the condition and risk assessments detailed in the AMP</li> <li>The FIXD asset and works management system is then used to schedule tasks in accordance with established priorities</li> <li>For corrective and emergency maintenance tasks, Ord Hydro's site staff are empowered to prioritise tasks based on their assessment of risks within Ord Hydro's established risk assessment framework. Ord Hydro does not apply a detailed priority rating to these tasks as it considers that it has allocated sufficient site based resources to accommodate all priority tasks in a timely manner</li> <li>Sighted evidence of risk based decision making in prioritising inspections and remedial maintenance work.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
6.6 Maintenance costs are measured and monitored	<p>Through discussion with the Site Manager and Asset Engineering Manager, inspection of relevant documentation and visit to Ord Hydro's Kununurra operations, we determined that Ord Hydro measures and monitors maintenance expenditure (including variations to budget) through its detailed monthly profit centre report.</p>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

## 4.7 Asset Management Information System

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

**Expected outcome:** The asset management information system provides authorised, complete and accurate information for the day-to-date running of the AMS. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards.

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

Effectiveness Criteria	Findings
7.1 Adequate system documentation for users and IT operators	<p>Through discussion with the Network Security Lead and inspection of relevant documentation we determined that:</p> <ul style="list-style-type: none"> <li>The key information systems used for Ord Hydro's management of its generation and transmission network assets are: <ul style="list-style-type: none"> <li>FIXD asset and works management system</li> <li>SAP (financial modules)</li> <li>SCADA</li> <li>RiskWizard (risk management system)</li> </ul> </li> <li>System documentation and guidance supporting the FIXD, SAP, SCADA and RiskWizard systems is maintained on Ord Hydro's intranet.</li> </ul>
	<b>Adequacy Rating:</b> Adequately defined (A) <b>Performance Rating:</b> Performing effectively (1)
7.2 Input controls include appropriate verification and validation of data entered into the system	<p>Through discussion with the Network Security Lead and consideration of Ord Hydro's IT security and management arrangements, we determined that:</p> <ul style="list-style-type: none"> <li>All staff, contractors and authorised third parties with access to Ord Hydro equipment, systems and resources are required to abide by Pacific Hydro's Electronic Usage Policy</li> <li>Processes used to input or process information into the FIXD and SAP systems include sufficient elements of management oversight and review in relation to verification or validation of data</li> </ul>
	<b>Adequacy Rating:</b> Adequately defined (A) <b>Performance Rating:</b> Performing effectively (1)
7.3 Logical security access controls appears adequate, such as passwords	<p>Through discussion with the Network Security Lead and consideration of Ord Hydro's IT security and management arrangements, we determined that logical security access controls appear adequate, including the application of:</p> <ul style="list-style-type: none"> <li>Two factor authentication for all remote access</li> <li>A predefined password policy.</li> </ul>
	<b>Adequacy Rating:</b> Adequately defined (A) <b>Performance Rating:</b> Performing effectively (1)
7.4 Physical security access controls appear adequate	<p>Through discussion with the Network Security Lead and inspection of Ord Hydro's Kununurra site operations, we determined that:</p> <ul style="list-style-type: none"> <li>Server rooms house the servers for the relevant systems. These server rooms are located in data centres at Ord Hydro's Melbourne premises, with the ability to failover between data centres in a disaster scenario</li> <li>Access to server rooms is restricted via access cards on an as needs basis</li> </ul>

Effectiveness Criteria	Findings	
	<ul style="list-style-type: none"> <li>Access to Ord Hydro's Kununurra office is restricted through security over entrance points and monitored through an alarm system and a continuous CCTV system</li> <li>Access to the power station site is restricted through perimeter fencing, proximity switches and gates with password access controls.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
7.5 Data backup procedures appear adequate and backups are tested	<p>Through discussion with the Network Security Lead and consideration of Ord Hydro's IT security and management arrangements, we determined that:</p> <ul style="list-style-type: none"> <li>All of Ord Hydro's electronic data is managed through Pacific Hydro's IT infrastructure, which is hosted in Melbourne</li> <li>Back up procedures have been established for all systems and data that is hosted in the Pacific Hydro Melbourne IT infrastructure</li> <li>Back-ups for all relevant systems are performed at least once per day, with all critical data being backed up once per hour. All backup data is then replicated to Pacific Hydro's Disaster Recovery Server Infrastructure every three hours</li> <li>Pacific Hydro contracts with an external IT solutions provider to perform backups and to replicate the systems and information stored in the Pacific Hydro Melbourne IT infrastructure</li> <li>Testing of back-ups for different system modules are performed in accordance with Pacific Hydro's IT system backup policy.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
7.6 Key computations related to licensee performance reporting are materially accurate	<p>Through discussion with the Asset Engineering Manager and Manager Risk and Assurance, we determined that:</p> <ul style="list-style-type: none"> <li>Ord Hydro Does not use any designated system to compute information related to licensee performance reporting</li> <li>Information is compiled using spreadsheets for licensee performance reporting and annual reconciliations reported in accordance with Ord Hydro's PPA with Horizon Power. That information is compiled from data obtained from the FIXD, SAP and SCADA systems.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
7.7 Management reports appear adequate for the licensee to monitor licence obligations	<p>Through discussion with the Asset Engineering Manager and Manager Risk and Assurance and inspection of relevant documentation, we determined that Ord Hydro's existing management reports are appropriately used to monitor licence obligations as follows:</p> <ul style="list-style-type: none"> <li>Annual reconciliations reported in accordance with Ord Hydro's PPA with Horizon Power</li> <li>Monthly Generation reports, containing generation volume, availability and maintenance completion and Capex completion performance information.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

## 4.8 Risk management

**Key process:** Risk management involves the identification of risks and their management within an acceptable level of risk.

**Expected outcome:** An effective risk management framework is applied to manage risks related to the maintenance of service standards.

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

Effectiveness Criteria	Findings
<p>8.1 Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the AMS.</p> <p>8.2 Risks are documented in a risk register and treatment plans are actioned and monitored</p> <p>8.3 The probability and consequences of asset failure are regularly assessed</p>	<p>Through discussion with the Manager Risk and Assurance, examination of Ord Hydro's risk register, risk assessments and associated documentation, we determined that:</p> <ul style="list-style-type: none"> <li>• Ord Hydro applies the Pacific Hydro Group Risk Management Policy and supporting Risk Management Framework, which are consistent with the Australian Standard for Risk Management: <i>AS/NZS ISO 31000:2009 Risk Management - Principles and guidelines</i></li> <li>• That Risk Management Framework is applied to Ord Hydro's management of risks with its AMS</li> <li>• Application of Ord Hydro's risk management policies and procedures to minimise internal and external risks associated with the AMS is evidenced in its use of the Risk Wizard system, which captures all key risks relating to Ord Hydro's operations, including asset specific risks</li> <li>• We sighted evidence of key risks being reassessed, resulting in changes to the Ord Hydro risk register and risk treatments/actions</li> <li>• Risks relating to Ord Hydro's generation and transmission network assets are documented in the Risk Wizard system, which acts as Ord Hydro's risk register. Details captured for each risk include: <ul style="list-style-type: none"> <li>• Risk description</li> <li>• Risk sources &amp; causes</li> <li>• Residual risk rating</li> <li>• Responsible area</li> <li>• Potential consequences</li> <li>• Risk owner</li> <li>• Classification</li> <li>• Inherent risk rating</li> <li>• Status</li> <li>• Category</li> <li>• Controls in place</li> </ul> </li> <li>• Risk treatment plans are developed in accordance with the Pacific Hydro Group Risk Management Framework. Risk treatments are reflected in the Ord Hydro AMP and captured within the Risk Wizard system</li> <li>• During the review period, Ord Hydro undertook annual risk assessments, which <ul style="list-style-type: none"> <li>• Assessed the opportunities and threats in the system environment for the safe operation of the power plant and network assets. Those assessments were reflected in Ord Hydro's AMP</li> <li>• For each threat, assessed and predicted the consequences (on people, environment and supply of electricity) and likelihood of the occurrence of the threat for safe generation and delivery of electricity. Opportunities for improvement or prevention had been listed as part of controls within the risk assessment</li> </ul> </li> <li>• In 2016, Ord Hydro implemented an AIMS program, which uses internal and external assessments to assess likelihood and consequences of asset failure; and plans and implements mitigations for identified risks/consequences</li> <li>• A defects reporting procedure was implemented in 2016, outlining procedures required to assess risks (including likelihood and consequence of asset failure) associated with defects.</li> <li>• Technical asset integrity assessments completed during the review period included a review of mechanical protection and controls arrangements (considering potential hidden failures and risks).</li> </ul>
	<p><b>Adequacy Rating:</b> Adequately defined (A)</p> <p><b>Performance Rating:</b> Performing effectively (1)</p>

## 4.9 Contingency planning

**Key process:** Contingency plans document the steps to deal with the unexpected failure of an asset.

**Expected outcome:** Contingency plans have been developed and tested to minimise any significant disruptions to service standards.

**Overall Adequacy/Performance rating:** Requires some improvement (B) / Corrective action required (3)

Effectiveness Criteria	Findings	
9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	<p>Through discussion with the Asset Engineering Manager, Site Manager and Manager Risk and Assurance, and inspection and testing of contingency planning documentation, we determined that:</p> <ul style="list-style-type: none"> <li>• Ord Hydro has maintained four existing procedures relating to contingency plans for its generation and transmission network assets, including: <ul style="list-style-type: none"> <li>• Contingency Plan Procedure</li> <li>• Contingency Plan – Ord Hydro Power line Access</li> <li>• Contingency Plan –Power transformer</li> <li>• Contingency Plan – Substations and switchyards</li> </ul> </li> <li>• During the review period, Ord Hydro has not tested those contingency plans or maintained evidence of the training required for all relevant staff in relation to the purpose and content of the plans</li> <li>• Ord Hydro has also maintained an Emergency Response Plan, which is required to be supported through training and performance of drills or exercises with local Emergency Services to ensure all parties are suitably skilled and to ensure the ongoing review and improvement of its content. However, the drills and exercises required by the Plan have not been performed during the review period. Since July 2018, Ord Hydro has prepared a Safety Work Plan to schedule the required drills and exercised throughout 2019.</li> </ul>	
	<b>Adequacy Rating:</b> Requires some improvement (B)	<b>Performance Rating:</b> Corrective action required (3)
	<p><b>Recommendation 3/2018</b></p> <p>Ord Hydro:</p> <ul style="list-style-type: none"> <li>• Prepare a training plan and schedule to ensure all relevant staff are sufficiently trained in the purpose and content of each contingency plan</li> <li>• Schedule and carry-out testing of each contingency plan and emergency response plan.</li> </ul>	<p><b>Action Plan 3/2018</b></p> <ol style="list-style-type: none"> <li>1. A training plan for 2019 is being developed and will be completed in Q1 2019.</li> <li>2. Emergency response training will be conducted in Q2 2019.</li> </ol> <p><b>Responsible Person</b> Executive Manager - Operations</p> <p><b>Target Date</b> June 2019</p>

## 4.10 Financial planning

**Key process:** The financial planning component of the AMP brings together the financial elements of the service delivery to ensure its financial viability over the long term.

**Expected outcome:** A financial plan that is reliable and provides for the long-term financial viability of the services.

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

Effectiveness Criteria	Findings
10.1 The financial plan states the financial objectives and strategies and actions to achieve the objectives	<p>Through consideration of Ord Hydro's asset and business planning processes and inspection of Ord Hydro's annual budgets and AMPs, we determined that Ord Hydro's:</p> <ul style="list-style-type: none"> <li>Business plans provide an overview of the commercial objectives (revenue, cost of sales and asset contribution), strategies and actions of its business</li> <li>AMPs reflect the business objectives outlined in its business plans.</li> </ul>
	<p><b>Adequacy Rating:</b> Adequately defined (A)      <b>Performance Rating:</b> Performing effectively (1)</p>
10.2 The financial plan identifies the source of funds for capital expenditure and recurrent costs	<p>Through consideration of Ord Hydro's asset and business planning processes and inspection of Ord Hydro's annual budgets and AMPs, we determined that:</p> <ul style="list-style-type: none"> <li>Ord Hydro's annual budget outlines the source of funds for its capital and operational expenditure requirements</li> <li>Throughout the review period, all funds were sourced internally (through the Ord Hydro and Pacific Hydro group structure), with some provision for negotiated customer contributions.</li> </ul>
	<p><b>Adequacy Rating:</b> Adequately defined (A)      <b>Performance Rating:</b> Performing effectively (1)</p>
10.3 The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	<p>Through consideration of Ord Hydro's asset and business planning processes and inspection of Ord Hydro's annual budgets and supporting asset lifecycle models, we determined that:</p> <ul style="list-style-type: none"> <li>Ord Hydro's business planning process analyses and forecasts the lifecycle cost of owning and operating assets until FY2036</li> <li>Ord Hydro's Annual budgets outline projections of revenue, costs and asset contributions</li> <li>Ord Hydro's balance sheet items are consolidated into the Pacific Hydro Group balance sheet.</li> </ul>
	<p><b>Adequacy Rating:</b> Adequately defined (A)      <b>Performance Rating:</b> Performing effectively (1)</p>
10.4 The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period	<p>Through consideration of Ord Hydro's asset and business planning processes and inspection of Ord Hydro's annual budgets and supporting asset lifecycle models, we determined that Ord Hydro forecasts generation volumes and associated revenue until FY2036, with firm predictions forecast over a five year period.</p>
	<p><b>Adequacy Rating:</b> Adequately defined (A)      <b>Performance Rating:</b> Performing effectively (1)</p>
10.5 The financial plan provides for the operations and maintenance, administration and capital	<p>Through consideration of Ord Hydro's asset and business planning processes and inspection of Ord Hydro's annual budgets, AMPs and supporting asset lifecycle models, we determined that Ord Hydro forecasts the following cost requirements within its supporting asset lifecycle models:</p> <ul style="list-style-type: none"> <li>Site labour</li> </ul>

Effectiveness Criteria	Findings	
expenditure requirements of the services	<ul style="list-style-type: none"> <li>• Site management</li> <li>• Scheduled and unscheduled operations and maintenance</li> <li>• Refurbishment and upgrades.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
10.6 Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary	<p>Through discussion with the Asset Engineering Manager and consideration of Ord Hydro's monthly reporting processes, we determined that Ord Hydro's:</p> <ul style="list-style-type: none"> <li>• Monthly generation reports present: <ul style="list-style-type: none"> <li>• Variances in actual v budget figures for net generation and availability (representing revenue) and completion of maintenance and capital expenditure activity (representing costs)</li> <li>• Assessment of causes of variations</li> </ul> </li> <li>• Financial management procedures require variations exceeding \$100k to be analysed to determine causes and any required corrective actions.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

## 4.11 Capital expenditure planning

**Key process:** The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure 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

**Expected outcome:** A capital expenditure plan that provides reliable forward estimates of capital expenditure and asset disposal income, supported by documentation of the reasons for the decisions and evaluation of alternatives and options.

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

Effectiveness Criteria	Findings	
11.1 There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates	<p>Through discussion with the Asset Engineering Manager and consideration of Ord Hydro's asset and business planning processes and inspection of Ord Hydro's annual budgets, business plans and AMPs, we determined that although there is no specific capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities, the following documents address this requirement:</p> <ul style="list-style-type: none"> <li>• Ord Hydro business plans</li> <li>• Annual asset lifecycle models, which inform the AMP</li> <li>• Annual budgets.</li> </ul>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
11.2 The plan provides reasons for capital expenditure and timing of expenditure	<p>Through discussion with the Asset Engineering Manager and consideration of Ord Hydro's asset and business planning processes and inspection of Ord Hydro's AMPs and supporting asset lifecycle models, we determined that the annual AMPs outline capital expenditure requirements, including reasoning and timeframes for relevant refurbishment or upgrade activity.</p>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
11.3 The capital expenditure plan is consistent with the asset life and condition identified in the AMP	<p>Through discussion with the Asset Engineering Manager and consideration of Ord Hydro's asset and business planning processes and inspection of Ord Hydro's AMPs and supporting asset lifecycle models, we determined that Ord Hydro's annual AMP and supporting asset lifecycle model provide a sufficiently detailed overview and analysis on all forecast capital expenditure requirements up until FY36.</p>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
11.4 There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned	<p>Through discussion with the Asset Engineering Manager and consideration of Ord Hydro's asset and business planning processes and inspection of Ord Hydro's AMPs and supporting asset lifecycle models, we determined that Ord Hydro's capital expenditure requirements are reviewed and updated where relevant on an annual basis.</p>	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

## 4.12 Review of AMS

**Key process:** The AMS is regularly reviewed and updated.

**Expected outcome:** Review of the AMS to ensure the effectiveness of the integration of its components and their currency.

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

Effectiveness Criteria	Findings	
12.1 A review process is in place to ensure that the AMP and the AMS described therein are kept current	Through discussion with the Asset Engineering Manager and Manager Risk and Assurance, and inspection of Ord Hydro's AMPs for 2014, 2015, 2016 and 2017, we determined that in accordance with the Pacific Hydro Group Asset Management Policy, regular annual reviews to update the AMP were in place throughout the review period.	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)
12.2 Independent reviews (e.g. internal audit) are performed of the AMS	Through discussion with the Manager Risk and Assurance and inspection of relevant documentation, we determined that Pacific Hydro's Asset Management System has been certified to comply with the requirements of ISO 55001:2014 for the governance of the production of electricity through the management, operation, maintenance and administration of hydro and wind electric power generation facilities. The Ord Hydro facility is specifically included in the registered activities under that certification.  We sighted the most recent independent certification of Pacific Hydro's compliance with the requirements of ISO 55001:2014 issued by BSI on 23 February 2018.	
	<b>Adequacy Rating:</b> Adequately defined (A)	<b>Performance Rating:</b> Performing effectively (1)

# 5 Follow-up of previous review action plans

Reference (no./year)	Asset management effectiveness rating/ AMS Component & Criteria / details of the issue	Reviewer's recommendation or action taken	Date Resolved	Further action required
<b>A. Resolved before end of previous review period</b>				
N/A.				
<b>B. Resolved during current review period</b>				
2/2014	<b>Asset Planning</b> <i>1.8 Likelihood and consequences of asset failure are predicted</i> FMECA has been included in the AMS. However, no formal study has been undertaken so far.	<b>Recommendation</b> Undertake FMECA studies to identify failure modes of critical assets and the consequences of failures. Keep the results updated as change occurs within operational, engineering, and regulatory requirements. Develop a plan to mitigate identified failures associated with critical assets. <b>Action/s taken</b> Ord Hydro implemented an Asset Integrity Management process, which incorporates technical assessments and failure modes, effects and criticality analyses in order to identify failure consequences and related mitigations for critical assets.	September 2016	No
5/2014	<b>Asset Operations</b> <i>5.2 Risk management is applied to prioritise operations tasks</i> Risk assessments are carried out prior to undertaking operational tasks. However, the outcomes of those assessments are not used as a tool to prioritise the tasks.	<b>Recommendation</b> Develop a risk based operations prioritisation process to ensure the safety of the assets, people, and environment and update asset management system and operations management system / manuals accordingly. <b>Action/s taken</b> Ord Hydro's asset management planning and operations process has further evolved to link projects and operations tasks to asset condition assessments and risk assessments, which are reflected in the AMP.	September 2016	No
6/2014	<b>Asset Maintenance</b> <i>6.5 Risk management is applied to prioritise maintenance tasks</i>	<b>Recommendation</b> Develop risk based maintenance and inspection plans to prioritise maintenance tasks. Update asset management	September 2016	No

Reference (no./year)	Asset management effectiveness rating/ AMS Component & Criteria / details of the issue	Reviewer's recommendation or action taken	Date Resolved	Further action required
	Risk assessments are carried out prior to undertaking a maintenance tasks. However, those tasks are not formally prioritised in the CMMS based upon the criticality and the outcomes of the risk assessment.	system and MEX and WTG maintenance management system accordingly. <b>Action/s taken</b> Ord Hydro's asset management planning and maintenance process has further evolved to link maintenance tasks with the outcomes of asset condition assessments and other risk assessments, which are reflected in the AMP.		
7/2014	<b>Asset Management Information System</b> <i>7.4 Physical security access controls appear adequate</i> It was noted during site visits that external "Warning – High Voltage" signage around the power station and switch yard was in poor condition and warnings were illegible.	<b>Recommendation</b> Replace high voltage warning signage around the power station and switch yard sites to ensure it complies with standards. <b>Action/s taken</b> Signage was replaced and inspections included in site maintenance plans.	January 2015	No

Reference (no./year)	(Asset management effectiveness rating/ AMS Component & Criteria / details of the issue)	Reviewer's recommendation or action planned	Further action required
<b>C. Unresolved at end of current review period</b>			
1/2014	<b>Asset Planning</b> <i>1.4 Non-asset options (e.g. demand management) are considered</i> The asset management system does not specify requirements to assess non-asset solutions.	<b>Recommendation</b> Complete the closed out item 1.3 from the previous (2008-2011) asset management review recommendations. <u>Item 1.3 from the previous (2008-2011) asset management review:</u> "Include in the requirement for assessment of non-asset solutions in the Asset Management Framework and Codes and any other necessary documentation." <b>Action plan 1/2014</b> Identify any existing or develop new procedure and include in the asset management system. <b>Status</b> No progress has been made. Ord Hydro's AMP and/or supporting asset management system does not reference assessment of non-asset solutions (whether such an assessment is required or not). We note that Ord Hydro's operating strategy and contractual arrangements have not	Yes. To address this matter, we recommend that Ord Hydro use its AMP to reference its approach for assessing non-asset solutions (whether such an assessment is required or not) in its planning processes for asset modifications.

Reference (no./year)	(Asset management effectiveness rating/ AMS Component & Criteria / details of the issue)	Reviewer's recommendation or action planned	Further action required
		triggered a need to consider non-asset options in planning for asset modifications.	
3/2014	<p><b>Asset Disposal</b></p> <p><i>3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken</i></p> <p>Operational Performance Review process covers the utilisation and reliability of the assets. However, the reasons for poor performance and underutilisation are not critically examined to dispose those assets.</p>	<p><b>Recommendation</b></p> <p>Develop an asset disposal process including various alternative options assessment. Utilise Operational Performance Review process for disposal decision making. Update asset management system and capital expenditure planning process accordingly.</p> <p><b>Action plan 3/2014</b></p> <p>Update asset management plan to include and utilise asset disposal process based upon the underutilisation and poor performance of assets.</p> <p><b>Status</b></p> <p>No progress has been made. Ord Hydro's AMP and/or supporting asset management system does not reference asset disposal. We note Ord Hydro considers that an asset disposal process has not been required due to its power plant and transmission network assets being in the mid-phase of its asset lifecycle.</p>	<p>Yes.</p> <p>To address this matter, we recommend that Ord Hydro use its AMP to reference its asset disposal process, including the circumstances in which asset disposal will occur.</p>
4/2014	<p><b>Asset Disposal</b></p> <p><i>3.3 Disposal alternatives are evaluated</i></p> <p>AMS requires that alternatives to be considered before disposal however, no significant asset disposal has taken place within the review period. There is no existing policy, process, or procedure within the AMS for asset disposal should asset disposal be required.</p>	<p><b>Recommendation</b></p> <p>Develop an asset disposal evaluation process including alternative options. Identify opportunities for asset disposals as per the process.</p> <p><b>Action plan 4/2014</b></p> <p>Include disposal alternatives evaluation process in the asset management plan.</p> <p><b>Status</b></p> <p>No progress has been made. Ord Hydro's AMP and/or supporting asset management system does not reference asset disposal. We note Ord Hydro considers that an asset disposal process has not been required due to its power plant and transmission network assets being in the mid-phase of its asset lifecycle.</p>	<p>Yes.</p> <p>To address this matter, we recommend that Ord Hydro use its AMP to reference its asset disposal process, including the circumstances in which asset disposal will occur.</p>

Reference (no./year)	(Asset management effectiveness rating/ AMS Component & Criteria / details of the issue)	Reviewer's recommendation or action planned	Further action required
8/2014	<p><b>Contingency Planning</b></p> <p><i>9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks</i></p> <p>About five (5) contingency plans have been prepared and included in the AMS. However, testing of the plans has not been carried out</p>	<p><b>Recommendation</b></p> <p>Develop new disaster recovery contingency plans and update risk register. Keep records of regular testing.</p> <p><b>Action/s taken</b></p> <p>No progress has been made. Contingency plans have not been subject to testing during the review period.</p>	<p>Yes.</p> <p>Refer to Recommendation and Action Plan 3/2018</p>

# Appendix A - Review plan



Ord Hydro

2018 Electricity Integrated  
Regional Licence (EIRL4)  
Asset Management System  
Review

**Review Plan**

**August 2018**

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# Introduction

## Overview

The Economic Regulation Authority (the **ERA**) has, under the provisions of the Electricity Industry Act 2004 (the **Act**), issued to North Western Energy Pty Ltd, Pacific Hydro Group Two Pty Ltd & Energis Australia Pty Ltd (t/a Ord Hydro) (**Ord Hydro**) an Electricity Integrated Regional Licence (EIRL4) (the **Licence**).

Section 14 of the Act requires Ord Hydro to provide the ERA with a report by an independent expert acceptable to the ERA not less than once in every 24 month period (or any longer period that the ERA allows) as to the effectiveness of its asset management system. With the ERA's approval, Deloitte Risk Advisory Pty Ltd (**Deloitte**) has been appointed to conduct the review for the period 1 July 2014 to 30 June 2018 (**review period**).

The Licence relates to Ord Hydro's generation, transmission and retail activity in relation to its operation of a 30MW hydroelectric power station located in the Kimberley Region of Western Australia. Ord Hydro supplies power via its transmission network to the Argyle Diamond Mine and Horizon Power, which then distributes and retails power to customers in the township of Kununurra.

The review will be conducted in accordance with the April 2014 issue of the *Audit and Review Guidelines: Electricity and Gas Licences* (the **Guidelines**). In accordance with the Guidelines, this document represents the Review Plan (the **Plan**) that is to be agreed upon by Deloitte and Ord Hydro and presented to the ERA for approval.

## Objective

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

## Scope

In accordance with the Guidelines, the review will consider the effectiveness of Ord Hydro's existing control procedures within the 12 key processes in the asset management life-cycle as outlined below at Table 1. Each key process and effectiveness criteria is applicable to Ord Hydro's Licence and as such will be individually considered in this review.

**Table 1 – Asset management system key processes and effectiveness criteria**

#	Key processes	Effectiveness criteria
1	Asset Planning	<ul style="list-style-type: none"> <li>Asset management plan covers key requirements</li> <li>Planning processes and objectives reflect the needs of all stakeholders and is integrated with business planning</li> <li>Service levels are defined</li> <li>Non-asset operations (e.g. demand management) are considered</li> <li>Lifecycle costs of owning and operating assets are assessed</li> <li>Funding options are evaluated</li> <li>Costs are justified and cost drivers identified</li> <li>Likelihood and consequences of asset failure are predicted</li> <li>Plans are regularly reviewed and updated.</li> </ul>

#	Key processes	Effectiveness criteria
2	Asset Creation and Acquisition	<ul style="list-style-type: none"> <li>• Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions</li> <li>• Evaluations include all life-cycle costs</li> <li>• Projects reflect sound engineering and business decisions</li> <li>• Commissioning tests are documented and completed</li> <li>• Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood.</li> </ul>
3	Asset Disposal	<ul style="list-style-type: none"> <li>• Underutilised and underperforming assets are identified as part of a regular systematic review process</li> <li>• The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken</li> <li>• Disposal alternatives are evaluated</li> <li>• There is a replacement strategy for assets.</li> </ul>
4	Environmental Analysis (all external factors that affect the system)	<ul style="list-style-type: none"> <li>• Opportunities and threats in the system environment are assessed</li> <li>• Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved</li> <li>• Compliance with statutory and regulatory requirements</li> <li>• Achievement of customer service levels.</li> </ul>
5	Asset Operations	<ul style="list-style-type: none"> <li>• Operational policies and procedures are documented and linked to service levels required</li> <li>• Risk management is applied to prioritise operations tasks</li> <li>• 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</li> <li>• Operational costs are measured and monitored</li> <li>• Staff receive training commensurate with their responsibilities.</li> </ul>
6	Asset Maintenance	<ul style="list-style-type: none"> <li>• Maintenance policies and procedures are documented and linked to service levels required</li> <li>• Regular inspections are undertaken of asset performance and condition</li> <li>• Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule</li> <li>• Failures are analysed and operational/maintenance plans adjusted where necessary</li> <li>• Risk management is applied to prioritise maintenance tasks</li> <li>• Maintenance costs are measured and monitored.</li> </ul>

#	Key processes	Effectiveness criteria
7	Asset Management Information System	<ul style="list-style-type: none"> <li>• Adequate system documentation for users and IT operators</li> <li>• Input controls include appropriate verification and validation of data entered into the system</li> <li>• Logical security access controls appear adequate, such as passwords</li> <li>• Physical security access controls appear adequate</li> <li>• Data back-up procedures appear adequate</li> <li>• Key computations related to licensee performance reporting are materially accurate</li> <li>• Management reports appear adequate for the licensee to monitor licence obligations.</li> </ul>
8	Risk Management	<ul style="list-style-type: none"> <li>• Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system</li> <li>• Risks are documented in a risk register and treatment plans are actioned and monitored</li> <li>• The probability and consequences of asset failure are regularly assessed.</li> </ul>
9	Contingency Planning	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks.
10	Financial Planning	<ul style="list-style-type: none"> <li>• The financial plan states the financial objectives and strategies and actions to achieve the objectives</li> <li>• The financial plan identifies the source of funds for capital expenditure and recurrent costs</li> <li>• The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)</li> <li>• The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period</li> <li>• The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services</li> <li>• Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary.</li> </ul>
11	Capital Expenditure Planning	<ul style="list-style-type: none"> <li>• There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates</li> <li>• The plan provides reasons for capital expenditure and timing of expenditure</li> <li>• The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan</li> <li>• There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned.</li> </ul>
12	Review of Asset Management System	<ul style="list-style-type: none"> <li>• A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current</li> <li>• Independent reviews (e.g. internal audit) are performed of the asset management system.</li> </ul>

## Responsibility

### **Ord Hydro's responsibility for maintaining an effective asset management system**

Ord Hydro is responsible for putting in place policies, procedures and controls, which are designed to provide for an effective asset management system for assets subject to the Licence.

### **Deloitte's responsibility**

Our responsibility is to express a conclusion on the effectiveness of Ord Hydro's asset management systems to meet Licence requirements based on our procedures. The engagement will be conducted in accordance with Australian Standard on Assurance Engagements (**ASAE**) 3500 *Performance Engagements* issued by the Australian Auditing and Assurance Standards Board and the Guidelines, in order to state whether, in all material respects, based on the work performed, anything has come to our attention that causes us to believe Ord Hydro had not established and maintained an effective asset management system for assets subject to the Licence, as measured by the effectiveness criteria in the Guidelines and the systems have not operated effectively for the period 1 July 2014 to 30 June 2018. These standards also require us to comply with the relevant ethical requirements of the Australian professional accounting bodies. Our engagement provides limited assurance as defined in ASAE 3500.

### **Limitations of use**

The review report is intended solely for the information and internal use of Ord Hydro and is not intended to be and should not be used by any other person or entity. No other person or entity is entitled to rely, in any manner, or for any purpose, on this report.

We understand that a copy of the report will be provided to the ERA for the purpose of reporting on the effectiveness of Ord Hydro's asset management systems. We agree that a copy of the report may be provided to the ERA for its information in connection with this purpose but, as will be made clear in the report, only on the basis that we accept no duty, liability or responsibility to the ERA in relation to the report. We accept no duty, responsibility or liability to any party, other than Ord Hydro, in connection with the report or this engagement.

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

### **Inherent limitations**

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

### **Independence**

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

# Approach

The review will be conducted in three distinct phases, being a risk assessment, system analysis/policy and procedure review and examination of performance. From the review results, a report will be produced to outline findings, overall assessments and recommendations for improvement in line with the Guidelines. Each step of the review is discussed in detail below.

## Risk Assessment

The review will focus on identifying or assessing those activities and management control systems to be examined and the matters subject to review. Therefore, the purpose of conducting the risk assessment as a preliminary phase enables the reviewer to focus on pertinent/high risk areas of Ord Hydro's asset management systems established for the assets subject to Ord Hydro's licence. The risk assessment gives specific consideration to changes to Ord Hydro's relevant systems and processes and any matters of significance raised by the ERA and/or Ord Hydro. The level of risk and materiality of the process determine the level of review required i.e. the greater the materiality and the higher the risk, the more effort will be applied.

The first step of the risk assessment is the rating of the potential consequences of Ord Hydro not effectively maintaining an asset management system for the assets subject to its licence, in the absence of mitigating controls. The consequence rating descriptions listed at Table 15 of the Guidelines (refer to **Appendix 1**), provides the risk assessment with context to enable the appropriate consequence rating to be applied to each component of the asset management system subject to review.

Once the consequence has been determined, the likelihood of Ord Hydro not effectively maintaining an asset management system for the assets subject to its licence (with reference to the defined effectiveness criteria) is assessed using the likelihood rating listed at Table 16 of the Guidelines (refer to **Appendix 1**). The assessment of likelihood is based on the expected frequency of non-performance against the defined criteria, over a period of time.

Table 2 below (sourced from Table 17 of the Guidelines) outlines the combination of consequence and likelihood ratings to determine the level of inherent risk associated with each individual effectiveness criteria.

**Table 2: Inherent risk rating**

Likelihood	Consequence		
	Minor	Moderate	Major
Likely	Medium	High	High
Probable	Low	Medium	High
Unlikely	Low	Medium	High

Once the level of inherent risk has been determined, the adequacy of existing controls is assessed in order to determine the level of control risk. Controls are assessed and prioritised as weak, moderate or strong dependant on their suitability to mitigate the risks identified. The control adequacy ratings used by this risk assessment are aligned to the ratings listed at Table 19 of the Guidelines (refer to **Appendix 1**).

Once inherent risks and control risks are established, the review priority can then be determined using the matrix listed at Table 20 of the Guidelines (refer to **Table 3** below). Essentially, the higher the level of risk the greater the level of examination is required.

**Table 3: Assessment of Review Priority**

	Adequacy of existing controls		
Inherent Risk	Weak	Moderate	Strong
High	Review priority 1	Review priority 2	
Medium	Review priority 3	Review priority 4	
Low	Review priority 5		

The following table outlines the review requirement for each level of review priority. Testing can range from extensive substantive testing around the controls and activities of particular processes (including physical inspection of asset infrastructure, which will be given greater attention for those processes with a review priority of 1, 2 or 3) to confirming the existence of controls through discussions with relevant staff.

**Table 4: Review Priority Table**

Priority Rating and Resulting Review Procedures	
Rating	Review requirement
Priority 1	<ul style="list-style-type: none"> <li>Controls testing and extensive substantive testing of activities</li> <li>Follow-up and if necessary, re-test matters previously reported.</li> </ul>
Priority 2	<ul style="list-style-type: none"> <li>Controls testing and moderate substantive testing of activities</li> <li>Follow-up and if necessary, re-test matters previously reported.</li> </ul>
Priority 3	<ul style="list-style-type: none"> <li>Limited controls testing (moderate sample size). Only substantively test activities if further control weakness found</li> <li>Follow-up of matters previously reported.</li> </ul>
Priority 4	<ul style="list-style-type: none"> <li>Confirmation of existing controls via observation and walk through testing</li> <li>Follow-up of matters previously reported.</li> </ul>
Priority 5	<ul style="list-style-type: none"> <li>Confirmation of existing controls via observation, discussions with key staff and/or reliance on key references ("desktop review").</li> </ul>

The risk assessment has been discussed with stakeholders to gain their input as to the appropriateness and factual accuracy of risk and control ratings and associated explanations. The key sources considered in reaching our preliminary assessment of the risk and control ratings were based on:

- Prior assessments of the state of relevant controls during the previous review
- Our understanding of Ord Hydro's assets and internal processes
- Our understanding of the electricity industry and regulatory environment
- Any other factors that may have an effect on the level of risk or strength of controls.

At this stage, the risk assessment can only be a preliminary assessment based on reading of documentation and interviews by the auditors. It is possible that the ratings and risk assessment comments may be revised as we conduct our work and new evidence comes to light. Accordingly, the risk assessment for this review is a preliminary draft, not a final report, and no reliance should be placed on its findings. It is however, an invaluable tool for focussing review effort.

The asset management system review risk assessment is attached at **Appendix 2**.

### **Systems analysis/policy and procedure review**

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

- Interviewing Ord Hydro representatives and key operational and administrative staff responsible for the development and maintenance of policies and procedural type documentation
- Examination of documented policies and procedures for key functional requirements and consideration of their relevance to Ord Hydro's asset management system requirements and standards.

The policy and procedure definition element of the asset management system review will be performed to provide a rating as defined under Table 5 (refer below).

Key documents which may be subject to review are not specifically disclosed in this plan. A list of documents examined will be included in the review report.

### **Examination of performance**

The actual performance of the relevant controls and processes in place will then be examined via:

- Consideration of reports and references evidencing activity
- Interviews with Ord Hydro representatives and key operational and administrative staff
- Physical visit to the facility's site
- Consideration of the facility's function, normal modes of operation and age.

A full work program will be completed to record the specific aspects of our review and examination of the performance of each asset management system key process. This work program will be based on:

- The review priority determined by the risk assessment to be applicable to each effectiveness criteria
- The results of the policy and procedure review, as described above
- The location of personnel and activity to be tested.

The performance effectiveness element of the asset management system review will be performed to provide a rating as defined under Table 6 (refer below).

## Reporting

In accordance with the Guidelines, the reviewer must provide an assessment of both the process and policy definition rating (refer to **Table 5** below and **Table 8** of the Guidelines) and the performance rating (refer to **Table 6** below and **Table 9** of the Guidelines) for each of the key processes in Ord Hydro's asset management system.

**Table 5: Asset management process and policy definition adequacy ratings**

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

**Table 6: Asset management performance ratings**

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

The asset management review report will be structured to address all key components expected by the Guidelines, including:

- Response to previous review recommendations (refer to **Appendix 3**)
- Performance summary and rating for each effectiveness criteria (Table 1), utilising the asset management process and policy definition adequacy ratings (Table 5) and the asset management performance ratings (Table 6)
- Review observations for each effectiveness criteria
- Where appropriate, recommendations on actions required to address opportunities for improvement or process deficiencies.

Where appropriate, Ord Hydro will provide a post review implementation plan for incorporation into the report as an appendix.

## Key Ord Hydro contacts

- Cesar Salvatierra Executive Manager, Engineering Operations Services
- Brian Walter Ord Hydro Manager
- Stuart Lester Maintenance Technician
- Hongtao Cao Asset Engineering Manager
- Duncan Alexander Senior Operations Engineer
- Kate Summers Electrical Engineering Manager
- Dharmendra Kumar Manager – Risk and Assurance

- Hendri Mentz Partner
- Andrew Baldwin Specialist Leader Regulatory Compliance and Lead Auditor
- Wei Hao Tan Senior Analyst
- Lyle Stewart Analyst
- Kecheng Shen Manager (Engineer)
- Vincent Snijders Partner - Quality Assurance.
- Felicia Tristante Technical QA Director (Engineer)

## Timing

- Planning (including risk assessment): 15 hours
- Fieldwork (including system analysis, testing and site visit): 60 hours
- Reporting: 20 hours.

# Appendix 1 – Risk assessment key

## 1-1 Consequence ratings

Source: Guidelines – Electricity and Gas Licences April 2014

Examples of non-compliance				
Rating		Supply quality and reliability	Consumer protection	Breaches of legislation or other licence conditions
1	Minor	Breach of supply quality or reliability standards minor - affecting a small number of customers. Delays in providing a small proportion of new connections.	Customer complaints procedures not followed in a few instances. Small percentage of disconnections or reconnections not completed on time. Small percentage of bills not issued on time.	Legislative obligations or licence conditions not fully complied with, minor impact on customers or third parties. Compliance framework generally fit for purpose and operating effectively.
2	Moderate	Supply quality breach events that significantly impact customers; large number of customers affected and/or extended duration and/or damage to customer equipment. Supply interruptions affecting significant proportion of customers on the network for up to one day. Significant number of customers experiencing excessive number of interruptions per annum. Significant percentage of new connections not provided on time/ some customers experiencing extended delays.	Significant percentage of complaints not being correctly handled. Customers not receiving correct advice regarding financial hardship. Significant percentage of bills not issued on time. Ongoing instances of disconnections and reconnections not completed on time. Remedial actions not being taken or proving ineffective. Instances of wrongful disconnection.	More widespread breaches of legislative obligations or licence conditions over time. Compliance framework requires improvement to meet minimum standards.
3	Major	Supply interruptions affecting significant proportion of customers on the network for more than one day. Majority of new connections not completed on time/ large number of customers experiencing extended delays.	Significant failure of one or more customer protection processes leading to ongoing breaches of standards. Ongoing instances of wrongful disconnection	Wilful breach of legislative obligation or licence condition. Widespread and/or ongoing breaches of legislative obligations or licence conditions. Compliance framework not fit for purpose, requires significant improvement.

**1-2 Likelihood ratings**

Source: Guidelines – Electricity and Gas Licences April 2014

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

**1-3 Likelihood ratings**

Source: Guidelines – Electricity and Gas Licences April 2014

Rating	Description
Strong	Strong controls that mitigate the identified risks to an appropriate level
Moderate	Moderate controls that only cover significant risks; improvement required
Weak	Controls are weak or non-existent and have minimal impact on the risks

# Appendix 2 – Risk Assessment

<b>1</b>	<b>Asset Planning</b>					
<b>Key Process:</b>	Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).					
<b>Outcome:</b>	Integration of asset strategies into operational or business plans will establish a framework for existing and new assets to be effectively utilised and their service potential optimised.					
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
1.1	Asset management plan covers key requirements	Moderate	Probable	Medium	Moderate	Priority 4
1.2	Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	Minor	Probable	Low	Strong	Priority 5
1.3	Service levels are defined	Moderate	Unlikely	Medium	Strong	Priority 4
1.4	Non-asset options (e.g. demand management) are considered	Moderate	Probable	Medium	Weak	Priority 4
1.5	Lifecycle costs of owning and operating assets are assessed	Moderate	Probable	Medium	Moderate	Priority 4
1.6	Funding options are evaluated	Minor	Probable	Low	Moderate	Priority 5
1.7	Costs are justified and cost drivers identified	Moderate	Probable	Medium	Strong	Priority 4
1.8	Likelihood and consequences of asset failure are predicted	Major	Probable	High	Moderate	Priority 2
1.9	Plans are regularly reviewed and updated	Minor	Unlikely	Low	Strong	Priority 5

<b>2</b>		<b>Asset Creation and Acquisition</b>				
<b>Key Process:</b>		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				
<b>Outcome:</b>		A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery.				
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
2.1	Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions	Moderate	Probable	Medium	Moderate	Priority 4
2.2	Evaluations include all life-cycle costs	Moderate	Probable	Medium	Moderate	Priority 4
2.3	Projects reflect sound engineering and business decisions	Moderate	Probable	Medium	Moderate	Priority 4
2.4	Commissioning tests are documented and completed	Moderate	Unlikely	Medium	Strong	Priority 4
2.5	Ongoing legal/environmental/ safety obligations of the asset owner are assigned and understood	Major	Probable	High	Moderate	Priority 2

  

<b>3</b>		<b>Asset Disposal</b>				
<b>Key Process:</b>		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.				
<b>Outcome:</b>		Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.				
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
3.1	Under-utilised and under-performing assets are identified as part of a regular systematic review process	Moderate	Probable	Low	Moderate	Priority 4
3.2	The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	Moderate	Probable	Low	Moderate	Priority 4
3.3	Disposal alternatives are evaluated	Minor	Probable	Low	Moderate	Priority 5
3.4	There is a replacement strategy for assets	Moderate	Probable	Medium	Moderate	Priority 4

<b>4</b>	<b>Environmental Analysis</b>					
<b>Key Process:</b>	Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.					
<b>Outcome:</b>	The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements.					
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
4.1	Opportunities and threats in the system environment are assessed	Moderate	Probable	Medium	Moderate	Priority 4
4.2	Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	Moderate	Probable	Medium	Moderate	Priority 4
4.3	Compliance with statutory and regulatory requirements	Moderate	Probable	Medium	Moderate	Priority 4
4.4	Achievement of customer service levels	Moderate	Probable	Medium	Strong	Priority 4

<b>5</b>	<b>Asset Operations</b>					
<b>Key Process:</b>	Operational functions relate to the day-to-day running of assets and directly affect service levels and costs.					
<b>Outcome:</b>	Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.					
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
5.1	Operational policies and procedures are documented and linked to service levels required	Moderate	Probable	Medium	Moderate	Priority 4
5.2	Risk management is applied to prioritise operations tasks	Moderate	Probable	Medium	Weak	Priority 3
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	Moderate	Probable	Medium	Moderate	Priority 4
5.4	Operational costs are measured and monitored	Moderate	Probable	Medium	Moderate	Priority 4
5.5	Staff receive training commensurate with their responsibilities	Moderate	Probable	Medium	Moderate	Priority 4

6	Asset Maintenance					
<b>Key Process:</b>	Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.					
<b>Outcome:</b>	Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.					
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
6.1	Maintenance policies and procedures are documented and linked to service levels required	Major	Probable	High	Moderate	Priority 2
6.2	Regular inspections are undertaken of asset performance and condition	Major	Probable	High	Moderate	Priority 2
6.3	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	Major	Probable	High	Moderate	Priority 2
6.4	Failures are analysed and operational/maintenance plans adjusted where necessary	Major	Probable	High	Moderate	Priority 2
6.5	Risk management is applied to prioritise maintenance tasks	Major	Probable	High	Weak	Priority 1
6.6	Maintenance costs are measured and monitored	Moderate	Probable	Medium	Moderate	Priority 4

<b>7</b>		<b>Asset Management Information System</b>				
<b>Key Process:</b>		An asset management information system is a combination of processes, data and software that support the asset management functions.				
<b>Outcome:</b>		The asset management information system provides authorised, complete and accurate information for the day-to-date running of the asset management system. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards.				
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
7.1	Adequate system documentation for users and IT operators	Minor	Probable	Low	Moderate	Priority 5
7.2	Input controls include appropriate verification and validation of data entered into the system	Moderate	Probable	Medium	Moderate	Priority 4
7.3	Logical security access controls appear adequate, such as passwords	Minor	Probable	Low	Strong	Priority 5
7.4	Physical security access controls appear adequate	Minor	Probable	Low	Moderate	Priority 5
7.5	Data backup procedures appear adequate	Moderate	Probable	Medium	Strong	Priority 4
7.6	Key computations related to licensee performance reporting are materially accurate	Minor	Probable	Low	Strong	Priority 5
7.7	Management reports appear adequate for the licensee to monitor licence obligations	Minor	Probable	Low	Strong	Priority 5

  

<b>8</b>		<b>Risk Management</b>				
<b>Key Process:</b>		Risk management involves the identification of risks and their management within an acceptable level of risk.				
<b>Outcome:</b>		An effective risk management framework is applied to manage risks related to the maintenance of service standards				
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Control Risk	Review Priority
8.1	Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system	Major	Probable	High	Moderate	Priority 2
8.2	Risks are documented in a risk register and treatment plans are actioned and monitored	Moderate	Probable	Medium	Moderate	Priority 4
8.3	The probability and consequences of asset failure are regularly assessed	Major	Probable	High	Moderate	Priority 2

9	Contingency Planning					
<b>Key Process:</b>	Contingency plans document the steps to deal with the unexpected failure of an asset.					
<b>Outcome:</b>	Contingency plans have been developed and tested to minimise any significant disruptions to service standards.					
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
9.1	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	Major	Probable	High	Moderate	Priority 2

10	Financial Planning					
<b>Key Process:</b>	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.					
<b>Outcome:</b>	A financial plan that is reliable and provides for the long-term financial viability of the services.					
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
10.1	The financial plan states the financial objectives and strategies and actions to achieve the objectives	Moderate	Probable	Medium	Strong	Priority 4
10.2	The financial plan identifies the source of funds for capital expenditure and recurrent costs	Minor	Probable	Low	Moderate	Priority 5
10.3	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	Minor	Probable	Low	Strong	Priority 5
10.4	The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period	Minor	Probable	Low	Strong	Priority 5
10.5	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	Moderate	Probable	Medium	Moderate	Priority 4
10.6	Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary	Moderate	Probable	Medium	Moderate	Priority 4

11	Capital Expenditure Planning					
<b>Key Process:</b>	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					
<b>Outcome:</b>	A capital expenditure plan that provides reliable forward estimates of capital expenditure and asset disposal income, supported by documentation of the reasons for the decisions and evaluation of alternatives and options.					
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
11.1	There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates	Moderate	Probable	Medium	Strong	Priority 4
11.2	The plan provides reasons for capital expenditure and timing of expenditure	Minor	Probable	Low	Strong	Priority 5
11.3	The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	Moderate	Probable	Medium	Strong	Priority 4
11.4	There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned	Minor	Probable	Low	Moderate	Priority 5

  

12	Review of AMS					
<b>Key Process:</b>	The asset management system is regularly reviewed and updated.					
<b>Outcome:</b>	Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency.					
Ref	Effectiveness criteria	Consequence	Likelihood	Inherent Risk Rating	Controls Assessment	Review Priority
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	Minor	Probable	Low	Moderate	Priority 5
12.2	Independent reviews (e.g. internal audit) are performed of the asset management system	Minor	Probable	Low	Moderate	Priority 5

# Appendix 3 – Previous review recommendations

<b>Issue 1/2014</b> <i>Asset Planning: 1.4 Non-asset options (e.g. demand management) are considered</i> The asset management system does not specify requirements to assess non-asset solutions.	
<b>Recommendation 1/2014</b> Complete the closed out item 1.3 from the previous (2008-2011) asset management review recommendations. <b>Item 1.3 from the previous (2008-2011) asset management review</b> Include in the requirement for assessment of non-asset solutions in the Asset Management Framework and Codes and any other necessary documentation.	<b>Action Plan 1/2014</b> Identify any existing or develop new procedure and include in the asset management system. <b>Responsible Person</b> Executive Manager Operations <b>Target Date</b> 31 March 2015
<b>Issue 2/2014</b> <i>Asset Planning: 1.8 Likelihood and consequences of asset failure are predicted</i> FMECA has been included in the AMS. However, no formal study has been undertaken so far.	
<b>Recommendation 2/2014</b> Undertake FMECA studies to identify failure modes of critical assets and the consequences of failures. Keep the results updated as change occurs within operational, engineering, and regulatory requirements. Develop a plan to mitigate identified failures associated with critical assets.	<b>Action Plan 2/2014</b> Update asset management plan to include findings of the FMECA exercises. <b>Responsible Person</b> Executive Manager Operations <b>Target Date</b> 31 December 2014
<b>Issue 3/2014</b> <i>Asset Disposal: 3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken</i> Operational Performance Review process covers the utilisation and reliability of the assets. However, the reasons for poor performance and underutilisation are not critically examined to dispose those assets.	
<b>Recommendation 3/2016</b> Develop an asset disposal process including various alternative options assessment. Utilise Operational Performance Review process for disposal decision making. Update asset management system and capital expenditure planning process accordingly.	<b>Action Plan 3/2014</b> Update asset management plan to include and utilise asset disposal process based upon the underutilisation and poor performance of assets. <b>Responsible Person</b> Executive Manager Operations <b>Target Date</b> 30 June 2015

<b>Issue 4/2014</b> <i>Asset Disposal: 3.3 Disposal alternatives are evaluated</i> AMS requires that alternatives to be considered before disposal however, no significant asset disposal has taken place within the review period. There is no existing policy, process, or procedure within the AMS for asset disposal should asset disposal be required.	
<b>Recommendation 4/2014</b> Develop an asset disposal evaluation process including alternative options. Identify opportunities for asset disposals as per the process.	<b>Action Plan 4/2014</b> Include disposal alternative evaluation process to the asset management plan. <b>Responsible Person</b> Executive Manager Operations <b>Target Date</b> 30 June 2015
<b>Issue 5/2014</b> <i>Asset Operations: 5.2 Risk management is applied to prioritise operations tasks</i> Risk assessments are carried out prior to undertaking operational tasks. However, the outcomes of those assessments are not used as a tool to prioritise the tasks.	
<b>Recommendation 5/2014</b> Develop a risk based operations prioritisation process to ensure the safety of the assets, people, and environment and update asset management system and operations management system / manuals accordingly.	<b>Action Plan 5/2014</b> Undertake operations task analysis and assign task priorities into the task management system. Make operating staff aware of changes and provide necessary training if required. <b>Responsible Person</b> Executive Manager Operations <b>Target Date</b> 31 December 2015
<b>Issue 6/2014</b> <i>Asset Maintenance: 6.5 Risk management is applied to prioritise maintenance tasks</i> Risk assessments are carried out prior to undertaking a maintenance tasks. However, those tasks are not formally prioritised in the CMMS based upon the criticality and the outcomes of the risk assessment.	
<b>Recommendation 6/2014</b> Develop risk based maintenance and inspection plans to prioritise maintenance tasks. Update asset management system and MEX and WTG maintenance management system accordingly.	<b>Action Plan 6/2014</b> Undertake maintenance task analysis and assign task priorities into the MEX and WTG. Make maintenance staff aware of changes and provide necessary training if required. <b>Responsible Person</b> Executive Manager Operations <b>Target Date</b> 31 December 2015

<b>Issue 7/2014</b> <i>Asset Management Information System: 7.4 Physical security access controls appear adequate</i> It was noted during site visits that external “Warning – High Voltage” signage around the power station and switch yard was in poor condition and warnings were illegible.	
<b>Recommendation 7/2014</b> Replace high voltage warning signage around the power station and switch yard sites to ensure it complies with standards.	<b>Action Plan 7/2014</b> Include regular inspections of power station and switch yard statutory warning signage in site maintenance plans. <b>Responsible Person</b> Ord Hydro Manager <b>Target Date</b> 1 January 2015
<b>Issue 8/2014</b> <i>Contingency Planning: 9.1 Contingency plans are documented, understood, and tested to confirm their operability and to cover higher risks</i> About five (5) contingency plans have been prepared and included in the AMS. However, testing of the plans has not been carried out.	
<b>Recommendation 8/2014</b> Conduct a thorough risk assessment and identify opportunities to develop more disaster contingency plans and test those plans on a regular basis.	<b>Action Plan 8/2014</b> Develop new disaster recovery contingency plans and update risk register. Keep records of regular testing. <b>Responsible Person</b> Executive Manager Operations <b>Target Date</b> 31 December 2015

# Appendix B - References

## Ord Hydro staff participating in the review

- Ord Hydro Manager
- Maintenance Technician
- Asset Engineering Manager
- Senior Operations Engineer
- Network Security Lead
- Manager Risk and Assurance

## Deloitte staff participating in the review

			Hours
• Hendri Mentz	Partner		6
• Andrew Baldwin	Specialist Leader – Internal audit & Regulatory compliance		56
• Wei Hao Tan	Specialist Senior		18
• Kecheng Shen	Engineer and Technical Specialist		26
• Felicia Tristante	Engineer and Technical QA Director		2
• Vincent Snijders	Partner (Quality Assurance Review)		3

## Key documents and other information sources examined

- Pacific Hydro Asset Management Policy
- Ord Hydro Asset Management Plans (2015 to 2018)
- Ord Hydro Life Cycle Model spreadsheets (2015 to 2017)
- Horizon Power Power Purchase Agreement
- ADM Power Purchase Agreement
- Annual Budgets (2016 to 2018)
- Defect reporting procedure
- Risk Management Framework
- Ord Hydro Risk Register
- Ord Hydro Incident Register
- Ord Hydro Capital Expenditure Forecasts
- TOP Commissioning Procedure
- Example monthly reports
- Annual Horizon Power reconciliations
- Ord Hydro Licence Obligations Register
- Ord Hydro Compliance Breach Register
- Contingency Plan Procedure
- Contingency Plan – Ord Hydro Power line Access
- Contingency Plan –Power transformer
- Contingency Plan – Substations and switchyards
- Ord Hydro Asset Register
- OEM operating manual
- Listing of maintenance works completed

- Inspection activity checklists
- Inspection reports
- Maintenance Management Procedure
- Incident Reporting and Investigation Procedure
- ORD IT Infrastructure map
- Pacific Hydro Australia IT Disaster Recovery Plan
- Example Profit Centre reports
- Pacific Hydro HSE Incident Reporting Procedure
- Ord Hydro Health and Safety Register
- 2019 Safety Work Plan
- PH 2017 Financial Statements
- BSI ISO55001 Certificate
- BSI ISO55001 Certification Report

# Appendix C - Post review implementation plan

<p><b>Issue 1/2014</b></p> <p><i>Asset planning: 1.4 Non-asset options (e.g. demand management) are considered</i></p> <p>Item 1/2014 of the 2014 AMS review report identified that Ord Hydro's asset management system did not specify requirements to assess non-asset solutions.</p> <p>As the relevant action plan to address this matter had not been implemented during the review period, Ord Hydro has still not yet established a formal process or procedure for considering non-asset options. We recognise that Ord Hydro's operating strategy and contractual arrangements have not yet triggered a need for non-asset options to be considered in planning for modifications to assets</p>	
<p><b>Recommendation 1/2014</b></p> <p>Ord Hydro use its AMP to reference its approach for assessing non-asset solutions (whether such an assessment is required or not) in its planning processes for asset modifications.</p>	<p><b>Action Plan 1/2014</b></p> <p>Ord Hydro will implement this recommendation through its review and update of the AMP.</p> <p><b>Responsible Person</b> Asset Engineering Manager</p> <p><b>Target Date</b> September 2019</p>
<p><b>Issues 3/2014 and 4/2014</b></p> <p><i>Asset disposal: 3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken</i></p> <p><i>Asset disposal: 3.3 Disposal alternatives are evaluated</i></p> <p>Item 3/2014 of the 2014 AMS review report identified that although Ord Hydro's Operational Performance Review process covers the utilisation and reliability of the assets, the reasons for poor performance and underutilisation are not critically examined to dispose those assets.</p> <p>Item 4/2014 of the 2014 AMS review report identified that although no significant asset disposal has taken place within the review period, there is no existing policy, process, or procedure within the AMS for asset disposal should asset disposal be required.</p> <p>As the relevant action plans to address this matter had not been implemented during the review period, Ord Hydro has still not yet established a formal asset disposal process or procedure</p>	
<p><b>Recommendation 3/2014 and 4/2014</b></p> <p>Ord Hydro use its AMP to reference its asset disposal process, including the circumstances in which asset disposal will occur</p>	<p><b>Action Plan 3/2014 and 4/2014</b></p> <p>Ord Hydro will implement this recommendation through its review and update of the AMP.</p> <p><b>Responsible Person</b> Asset Engineering Manager</p> <p><b>Target Date</b> September 2019</p>

**Issue 1/2018**

*Asset operations: 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*

Although the FIXD asset register provides the base information on assets, further improvements can be made to the asset register to assist Ord Hydro to understand and manage the following aspects of its asset portfolio. We recognise that there is a cost/benefit balance to achieve in any further expansion asset records to be maintained in FIXD:

- Further description of asset type (e.g. specification, model, brand, version)
- Asset working environment (e.g. environmental conditions)
- Population sizes
- Material/technology applied
- Age (currently captured as engine hours at inspection)/remaining life/obsolescence
- Logistics data such as lead time, availability of parts.

**Recommendation 1/2018**

Ord Hydro include the following elements in its asset register:

- Further description of asset type
- Asset working environment
- Population sizes
- Material/technology applied
- Age/remaining life/obsolescence
- Logistics data.

**Action Plan 1/2018**

Although management is of the opinion that the current asset register and associated asset management planning process is sufficient to manage Ord Hydro's operations, consideration will be given to further enhancing the asset register as part of Pacific Hydro's planned implementation of a new Enterprise Asset Management System (as an upgrade to the current CMMS), which will interface with SAP, maintain the equipment register, bill of materials, maintenance strategies and schedule.

**Responsible Person**

Manager – Group Asset Management

**Target Date**

December 2019

**Issue 2/2018**

*Asset maintenance: 6.4 Failures are analysed and operational/maintenance plans adjusted where necessary*

Although Ord Hydro has established and carried out procedures for analysing failures/defects, the procedure does not provide sufficient instruction and guidance as to how that analysis feeds into any appropriate review and adjustment of operations and maintenance plans, such as through the annual AMP planning workshop.

**Recommendation 2/2018**

Ord Hydro expand its Defects Reporting Procedure to include specific guidance on:

- Assessment of consequences for past failures, including near-misses
- How operations and maintenance plans are prioritised and reviewed and adjusted by analysing past failures
- How work order information is used to feedback to the operation/maintenance plan and strategy, including documentation of conclusions and decisions, which are addressed within the annual AMP planning workshop.

**Action Plan 2/2018**

Although management is of the opinion that current processes around defects reporting and analysis are sufficient, this matter will be addressed in the next scheduled review of the Defects Reporting Procedure.

**Responsible Person**

Executive Manager - Operations

**Target Date**

October 2019

<b>Issue 3/2018</b> <i>Contingency planning: 9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks</i> During the review period, Ord Hydro has not tested those contingency plans or maintained evidence of the training required for all relevant staff in relation to the purpose and content of the plans.	
<b>Recommendation 3/2018</b> Ord Hydro: <ul style="list-style-type: none"> <li>• Prepare a training plan and schedule to ensure all relevant staff are sufficiently trained in the purpose and content of each contingency plan</li> <li>• Schedule and carry-out testing of each contingency plan and emergency response plan.</li> </ul>	<b>Action Plan 3/2018</b> 1. A training plan for 2019 is being developed and will be completed in Q1 2019. 2. Emergency response training will be conducted in Q2 2019. <b>Responsible Person</b> Executive Manager - Operations <b>Target Date</b> June 2019