2017 Asset Management System Review

NewGen Power Kwinana Pty Ltd

(EGL3)

Audit Report	Authorisation	Name	Position	Date
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GLOSSARY

Abbreviation	Description
AEMO	Australian energy market operator. The national market operator that succeeded IMO.
Alstom	ST and GT suppliers
AMP	Asset Management Plan
AMS	Asset Management System
BoP	Balance of Plant
CCTV	Closed circuit TV
CW	Cooling water
DCS	Distributed Control System
DM	Demand management
EOH	Equivalent operating hours; considers hours, starts and mode of operation
ERA	Economic Regulation Authority
FMECA	Failure modes effect cause analysis
GE	General Electric, now owners of Alstom suppliers
GES	Geographe Environmental Services
GT	Gas turbine
HP	High pressure
HPRM	Document management system about to be implemented
HRSG	Heat recovery steam generator
Hyperion	Excel interface software used for financials
ICG	Infrastructure Capital Group
IMO	State independent market operator; superseded by AEMO.
IP	Intermediate pressure
IT	Information Technology
JHA	Job hazard analysis
KIC	Kwinana Industries Council
KRA	Key Result Areas
LP	Low pressure
MEX	Computerised Maintenance Management System
MXL	MXL2 uprate for the gas turbine
NPK	NewGen Power Kwinana
OEM	Original equipment manufacturer
P&L	Profit and loss
PLC	Programmable logic controller
RASCI	Responsibility assignment matrix, **R**esponsibility, **A**ccountable, **S**upport, **C**onsulted, **I**nformed
SSCPH	Summit Southern Cross Power Holdings
ST	Steam turbine
SWIS	South West Interconnected System
TIL	Technical information letter
UPS	Uninterruptable power supply
WP	Western Power

This report is prepared by representatives of GES Pty Ltd in relation to the above named client's conformance to the nominated audit standard(s). Audits are undertaken using a sampling process and the report and its recommendations are reflective only of activities and records sighted during this audit process. GES Pty Ltd shall not be liable for loss or damage caused to or actions taken by third parties as a consequence of reliance on the information contained within this report or its accompanying documentation.

Quality Control Record

	CLIENT	DATE
REQUESTED BY	MARK HAMMOND	OCTOBER 2017
PREPARED BY	NICOLE DAVIES	OCTOBER 2017
CHECKED BY	SIMON ASHBY	OCTOBER 2017
REVISION 4	Secretariat's comments incorporated	FEBRUARY 2018

EXECUTIVE SUMMARY

The Licensee is NewGen Power Kwinana Pty Ltd.

Asset Overview

The Kwinana Power Station is jointly owned by Energy Infrastructure Trust (which is managed by Infrastructure Capital Group (ICG)) and Sumitomo Corporation.

ICG is an Australian-based infrastructure investment manager with over A$1 billion of equity funds under management.

ICG specialises in the origination and investment management of equity investments in the utility and infrastructure sectors. ICG has strong specialist capabilities in existing and development opportunities in the energy sector, including pricing, generation, transmission and distribution.

Sumitomo Corporation is one of the world's leading fully integrated trading and investing companies headquartered in Tokyo, Japan. Sumitomo has accumulated knowledge and experience from all over the world in many business fields over the years, from commodity trading, industry products distribution, mineral resources investments, infrastructure construction, operation and management etc.

Consistent with its long term growth policy, Sumitomo Corporation Group now holds a combined equity-based share of approximately 6,000MW in power generation capacity throughout the world (as of April 2013). Sumitomo has invested in the Kwinana Project through its wholly owned subsidiary, Summit Southern Cross Power Holdings Pty Ltd (SSCPH).

The Kwinana Power Station is a 327.8 MW combined-cycle, gas-fired power station located at the Kwinana industrial estate, 30km south of Perth, Western Australia.

The installed plant primarily consists of;

- One Alstom 13E2-MXL 165MW Gas Turbine fired on Natural Gas
- Associated GT Air Inlet and Exhaust Gas structures
- One Heat Recovery Steam Generator (HRSG) complete with Supplementary Gas Firing
- One Alstom 160MW integral IP/LP and HP Steam Turbine
- Natural Gas conditioning and metering station
- Water Treatment Plant
- Associated Balance of Plant required for effective operation
- The Main Cooling Water System is Sea Water supplied from the Cooling Water Intake located adjacent to NPK at the Synergy Kwinana PS.

The Kwinana Power Station provides highly-efficient, reliable and environmentally sound electricity at the lowest cost for West Australia employing an advanced low emission technology and a low water usage filtration and recycling system.

NewGen Power Kwinana invested in an $A30M upgrade package to the plant in December 2015. The GT13E2 gas turbine was fitted with the multi-mode MXL2 upgrade package resulting in an additional 7
MW of power and a 1% combined cycle plant efficiency increase. Additionally, the upgrade provided enhanced availability through increased maintenance intervals from 36,000 Equivalent Operating Hours (EOH) to 48,000 EOH (approximately 6 years) contributing to lower operating costs.

The intermediate load station is capable of supplying approximately 10% of Western Australia's electricity demand and contributes to the stability of the South West Interconnected System (SWIS) and the reliability of electricity supply in the region.

Through regular maintenance and monitoring, the Kwinana Power Station maintains its high efficiency power generation while minimising environmental impact.

NewGen Power Kwinana (NPK) had demonstrated a high level of compliance with its licence conditions and thus extended the Performance Audit period to 1st August 2014 to 31st July 2019 [Ref: ERA Notice 25 March 2015]. The audit period for the Asset Management Review was set by the ERA following the implementation of the audit action plans and covers the period 1st August 2014 to 31st July 2017.

Geographe Environmental Services has been approved by the Authority to undertake the works for the Asset Management Review subject to development of a review plan for the period 1st August 2014 to 31st July 2017 for a submission date of prior to the 31st October 2017.

The Asset Management System Review has been conducted in order to assess the effectiveness of the Kwinana Power Station Asset Management Systems. Through the execution of the Review Plan, field work, assessment and testing of the control environment, the information system, control procedures and compliance attitude, the review team members have gained reasonable assurance that NewGen Power Kwinana Pty Ltd has an effective asset management system during the review period 1st August 2014 to 31st July 2017. The overall adequacy B rating of the asset management system is due to the revision of the asset management system occurring after the end of the review period in September 2017.

The Licensee has implemented the recommendations of the previous review report and the effectiveness of the actions is evident in the compliance history during the review period.

The site review was conducted on the 12th of September and this review report is an accurate representation of the review team's findings and opinions. The Auditors confirm that the Licensee provided full access as required by the Audit Guidelines (2014), in respect to; access to facilities and business premise, access to data, reports, minutes, documentation, correspondence and process control data. Additionally, the Licensee ensure the appropriate

personnel were available and provided information as requested for external persons relevant to the audit process.

1 ASSET MANAGEMENT SYSTEM REVIEW SUMMARY

The asset management system was found to be satisfactory.

As required by section 11.4.2 of the Audit and Review Guidelines – Electricity and Gas Licences (April 2014).Table 2 summarises the auditor's assessment of both the process and policy definition rating and the performance rating for each key process in the licensees asset management system, using the scales described in Table 4 and Table 5 (refer Section 2.3 Asset Management Review Methodology). The rating was determined by the auditor's judgement based on the execution of the Review Plan.

The process and policy and asset management system adequacy ratings are summarised below;

Table 1 Asset Management System: Effectiveness Summary.

Asset Management System	Asset Management Process And Policy Definition Adequacy Rating	Asset Management Performance Rating
1. Asset planning	B	1
2. Asset creation/ acquisition	B	1
3. Asset disposal	B	1
4. Environmental analysis	B	1
5. Asset operations	B	1
6. Asset maintenance	B	1
7. Asset Management Information System	B	2
8. Risk management	B	1
9. Contingency planning	B	2
10. Financial planning	B	1
11. Capital expenditure planning	B	1
12. Review of AMS	B	1

The Audit and Review Guidelines – Electricity and Gas Licences (April 2014) require that auditors who have rated the adequacy of the process and policy definition process as C or D or the asset management performance as 3 or 4 also make recommendations to address the issue(s).

2 ASSET MANAGEMENT SYSTEM EFFECTIVENESS REVIEW

2.1 AMS Review Scope

The scope of the AMS review includes an assessment of adequacy and effectiveness of Kwinana Power Station's asset management system by evaluating during the review period 1st August 2014 to 31st July 2017 the following;

1. Asset Planning
2. Asset creation/acquisition
3. Asset disposal
4. Environmental analysis
5. Asset operations
6. Asset maintenance
7. Asset management information system
8. Risk management
9. Contingency planning
10. Financial planning
11. Capital expenditure planning
12. Review of asset management system

The review has been established as a requirement of the current Generating Licence issued by the Economic Regulation Authority to NewGen Power Kwinana Pty Ltd.

The asset management review follows the approved review plan and uses;

- a risk based approach to auditing using the risk evaluation model set out in ISO31000:2009
- an overall effectiveness rating for an asset management process, based on a combination of the process and policy adequacy rating and the performance rating
- the format and content of the reviewer's report; and post- implementation plan as described in the Guidelines.

Table 2 Interviewed Personnel during the Review.

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Engineering Manager	NewGen Power Pty Ltd
Kris Roots	Operations Manager	NewGen Power Pty Ltd
Tim Harrison	Maintenance Manager	NewGen Power Pty Ltd
James Hyland	Financial Controller	NewGen Power Pty Ltd.
Jacqui Passamani	Accountant	NewGen Power Pty Ltd

The key documents and other information sources are detailed below and further in Appendix 1.

Table 3 Key Reference Documents.

Ref #	Title
1	Asset Management Policy NPK-COR-AM-POL-001.pdf
2	Asset Management System Manual NPK-COR-AM-MAN-001.pdf
3	OLD AMS Newgen Kwinana August 2008 ver(4).pdf
4	Strategic Asset Management Plan NPK-COR-AM-PLN-002.pdf
5	OLD Kwinana LIFE PLAN ver04.pdf
6	1707B1 Business Performance Summary for Quarter ending Jun-17.pptx
7	NewGen Kwinana Power Station Life Cycle Model - V4N.xlsm
8	NewGen Power Kwinana - Budget Presentation FY18.pptx
9	NPK FY18 Detailed Budget Pack FINAL.pdf
10	Steam Turbine Asset Management Plan NPK-COR-AM-PLN-001.pdf
11	NPK Business Services Reports monthly 2014 - 2017.docx
12	1707B3 Steam Turbine Generator Inspection Timing.pdf
13	170421 NPK MAT MAI RASCI Matrix 2017 April 21.xlsx
14	Emergency Response Plan NPK-HSE-PLN-001.pdf
15	Health & Safety and Environmental Management Plan NPK-HSE-PLN-002.pdf
16	Health Safety and Environment Policy SSCP-PL-CA-006.pdf
17	Management of Change NPK-COR-ENG-PRO-003.pdf
18	Business Continuity Plan NPK-COR-AM-PLN-001.pdf
19	Incident Reports 01.07.14 - 30.06.17.pdf
20	IW159000-P2-CE-RPT-0001_0 NPK OoM Closure Cost Estimate - Basis of Estim....pdf
21	Kwinana Combined Cycle Power Station Steam Plant Risk and FMECA Analysis - V5.xlsm
22	NPK AP FIN 287 Administration Procedure Fixed Asset Accounting Capitalisation Policy Rev1 (Executed).pdf
23	NPK Compliance requirement schedule.pdf
24	OLD Corporate Risk Management Guideline.pdf
25	OLD Kwinana Asset Risk Management Policy ver 2.pdf
26	OLD NPK POL ADM 106 ERM Policy Manual Rev0.pdf
27	Outline Project Evaluation Form NPK-FA-FRM-001.pdf
28	NPK MP MAI 152 Maintenance Procedure Day to Day Maintenance Management Rev2.pdf
29	NPK Business Services Report May 2017.docx
30	NPK FRM ENG 009 Project Evaluation Rev5 ESP Oil Varnish removal unit.xlsx
31	Project Investment Appraisal Procedure NPK-FA-PRO-001.pdf
32	SD-5_14KP08_14SSC05_Operator Services Agreement NGPK SSCP dated 30-09-14....pdf
33	Daily Production Meeting Minutes 2014-17.pdf
34	Safety Environmental Operational monthly Minutes 2014-17.pdf
35	6.0 Export PM Listing.xlsx
36	6.1 Export 2017 PM Schedule.xlsx
37	8.0 NPK REG SAF 242 Risk Register Rev 4.xlsm
38	Management of Maintenance NPK-COR-MAI-PRO-001.pdf
39	Capex Spare MCW Pump Motor Rev_1.pdf"
40	08. NPK Trading Assumptions Workbook Budget Jul-17 to Jun-18 FINAL.PDF
41	09. Trading Variances Presentation.pdf
42	Non-Financial & Financial Budget Metrics.xlsx
43	28092016 NPK Operating Plan (FINAL).pdf

The review was conducted by Power & Energy Services and Geographe Environmental Services during September-October 2017 and included desktop review, one day's review to execute review plan and interview sessions and report writing. In total the review required 125 auditor hours for Nicole Davies and Simon Ashby to complete the review.

2.2 Objective of the Asset Management System Review

The objective of the review is to examine the effectiveness of the processes used by NewGen Power Kwinana Pty Ltd to deliver asset management, the information systems supporting asset management activities and the data and knowledge used to make decisions about asset management. These elements were examined from a life cycle perspective i.e. planning, construction, operation, maintenance, renewal, replacement and disposal using the guidelines developed by the Economic Regulation Authority.

2.3 Methodology for Asset Management System Review

The audit methodology detailed in the Audit Guidelines – Electricity and Gas Licences (April 2014) was used in the execution of the Asset Management System Review and is detailed in the Audit Plan.

Asset Management System Effectiveness Rating

The Audit Guidelines – Electricity and Gas Licences (April 2014) (section 11.4.2) states that the asset management review report must provide a table that summarises the auditor's assessment of both the process and policy definition rating and the performance rating for each key process in the licensee's asset management system using the scales described in Table 4 and Table 5. It is left to the judgement of the auditor to determine the most appropriate rating for each asset management process.

Table 4 Asset Management Process and Policy Definition Adequacy Ratings.

Rating	Description	Criteria
A	Adequately defined	• Processes and policies are documented. • Processes and policies adequately document the required performance of the assets. • Processes and policies are subject to regular reviews, and updated where necessary • The asset management information system(s) are adequate in relation to the assets that are being managed.
B	Requires some improvement	• Process and policy documentation requires improvement. • Processes and policies do not adequately document the required performance of the assets. • Reviews of processes and policies are not conducted regularly enough. • The asset management information system(s) require minor improvements (taking into consideration the assets that are being managed).
C	Requires significant improvement	• Process and policy documentation is incomplete or requires significant improvement. • Processes and policies do not document the required performance of the assets. • Processes and policies are significantly out of date. • The asset management information system(s) require significant improvements (taking into consideration the assets that are being managed).
D	Inadequate	• Processes and policies are not documented. • The asset management information system(s) is not fit for purpose (taking into consideration the assets that are being managed).

Table 5 Asset Management Performance Ratings

Rating	Description	Criteria
1	Performing effectively	• The performance of the process meets or exceeds the required levels of performance. • Process effectiveness is regularly assessed and corrective action taken where necessary.
2	Opportunity for improvement	• The performance of the process requires some improvement to meet the required level. • Process effectiveness reviews are not performed regularly enough. • Process improvement opportunities are not actioned.
3	Corrective action required	• The performance of the process requires significant improvement to meet the required level. • Process effectiveness reviews are performed irregularly, or not at all. • Process improvement opportunities are not actioned.
4	Serious action required	• Process is not performed, or the performance is so poor that the process is considered to be ineffective.

2.4 Deviations from the Review Plan

None.

3 FOLLOW UP REVIEW PROCESS

This is the fourth Asset Management Review conducted since the issue of the licence and all previous audit report findings have been reviewed as part of the content of this report. Review of actions taken in response to corrective actions and recommendations will form part of subsequent review plans.

3.1 Follow-Up from Previous Review Findings

The organisation has implemented the recommendations of the previous review where possible and as required by Section 11.3 of the Audit Guidelines (April 2014). Table 6 below details how all recommendations were addressed and their status in the current review period.

***Table 6* Ineffective components recommendations from previous Review Implementation Plan.**

ASSET MANAGEMENT REVIEW

A Resolved before the end of the previous review period.				
Reference (no,/yr)	**(Asset management effectiveness rating / AMS Component & C riteria)**	**Auditor's recommendation or action taken**	**Date resolved**	**Further action required (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**

No recommendations were implemented during the previous review period.

B. Resolved during current Review period				
Reference (no,/yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Date resolved**	**Further action required (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**
-	B2 / 1.5 Lifecycle costs of owning and operating assets are assessed. (also at 2.2). The Asset Life Plan was issued in July 2008 and had not been reviewed since. This finding is further addressed under EC1.9 (the Review has noted that the Asset Life Plan was reviewed after the Review period, in September 2014).	Recommendations made under EC1.9	Jan 2017	No – Life cycle plan revised by Jacobs in 2017. Refer:7 NewGen Kwinana Power Station Life Cycle Model - V4N.xlsm"
4/2014	B2 / 1.6 Funding options are evaluated. No procedure was found of the process of proposing, reviewing and approving major projects and evaluation of funding options. No procedure for review of funding options for unbudgeted items was found.	Document a procedure for proposal, review and approval of projects and for evaluation of funding options. Procedure should include Life Cycle Costing in new asset evaluations.	June 2016 & Aug 2017	No – Refer:22 NPK AP FIN 287 Administration Procedure Fixed Asset Accounting Capitalisation Policy Rev1 (Executed).pdf" Refer:31 Project Investment Appraisal Procedure NPK-FA-PRO-001.pdf"
5/2014	B2 / 1.8	Documentation on risk management, asset failure likelihood and consequences should be reviewed,	Mar 2016	No – Refer: 37 8.0 NPK REG SAF 242 Risk

B. Resolved during current Review period				
Reference (no,/yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Date resolved**	**Further action required (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**
	Likelihood and consequences of asset failure are predicted. Likelihood and consequences of asset failure were analysed in 2010, actions were identified however the Review noted that some of actions had not been followed up since 2010. Further findings and recommendations are raised at EC8.	updated where necessary and integrated so that documents are all made part of a working risk management system which is subject to management overview.		Register Rev 4.xlsm" compiled Mar 2016, July 2016 and Jan 2017, no updates yet.
7/2014	A spare Cooling Water (CW) pump motor was included in the budget 2013-14 as a DCS Spare Parts List line item for Critical Spares (as per Budget 31 August 2013) as no spare had been purchased previously. The increase in the line items was entered in the Budget and the cause identified however a full justification/case for the item was not noted	While the case for the CW Pump Motor appears sound, there should be evidence of justification of the costs.	May 2014	No – Refer:39 Capex Spare MCW Pump Motor Rev_1.pdf"
-	C/NR / 2.2 Evaluations include all life-cycle costs. Not applicable during the Review period however no documented procedure was evident showing the inclusion of life cycle cost evaluations in new asset project assessment.	Recommendation as per 4/2014, EC1.6	August 2015	No – As 4/2014 (EC1.6)
9/2014	B2 / 4.1 Opportunities and threats in the system environment are assessed. While there was evidence of reporting and review of plant operation and financial performance, there was no clear evidence of a systematic assessment by the asset management system of the external opportunities and threats and of corrective actions taken to maintain requirements.	Provide a methodology in the AMS for the assessment of opportunities and threats in the system environment.	August 2014	No – Threats and opportunities are addressed in monthly/quarterly reports Refer:140915 NPK Business Services Report August 2014.docx"
10/2014	B1 / 4.2 Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved. The documentation does not clearly identify the required operating performance standards, while some variances are discussed it is not possible to review the achievement of performance standards as those standards are not clearly set. For example the OSA stipulates an availability factor for the payment of incentives to the operator however that target is not shown in the monthly Business Services Reports.	There should be a definition of target operating performance standards, reviewed and updated at regular intervals (possibly annually) and regular assessment of plant operating performance against those standards (possibly monthly).	2016	No – Operational plan for financial year provides target performance together with variances to previous year and explanation of variances. Refer: 43 28092016 NPK Operating Plan (FINAL).pdf" Operational statistics are reported in monthly Business Service Reports with

B. Resolved during current Review period				
Reference (no,/yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Date resolved**	**Further action required (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**
				forecast performance.
11/2014, 12/2014	B2 / 4.3 Compliance with statutory and regulatory requirements. Annual power testing for the Certified Reserve Capacity was not included in the Calendar. The Review noted that the Compliance calendar indicates "ERA AMS Review" requirement; however there is no Audit, at times the Performance Audit timing is not synchronised with the AMS Review. There should be identification of the process for maintaining the currency of the "Compliance Calendar". One Environmental incident report was raised during February 2013: the annual audit on the ministerial statement 698 was not submitted to the Office of Environmental Protection Authority (OEPA) by the due date. The Audit had been completed by an external consultant before the due date of April 1 2012, but the Audit report was subsequently submitted to the OEPA in February 2013 when the OEPA contacted NPK due to an administrative error.	The Compliance Calendar should be reviewed to check if it is up to date and whether it should include the annual power testing for the Certified Reserve Capacity. The process for maintaining the currency of the "Compliance Calendar" should be documented.	Aug 2014	No – Power testing is arranged by Trading who have it on their calendar. AMP includes compliance monitoring
13/2014	B1 / 6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule. The Review noted that the maintenance procedures do not cover the management of forced outages.	Maintenance procedures should be reviewed and updated to address forced outages.	Aug 2014	No – Refer:28 NPK MP MAI 152 Maintenance Procedure Day to Day Maintenance Management Rev2.pdf"
14/2014, 15/2014	B1 / 7.1 Adequate system documentation for users and IT operators. Remaining AMS documentation is stored in the DMS however at present there are no controls on document management such as revision control. A basic set of instructions were provided in e-mails when the DMS started, with instructions on where to file documents and how to use it, however the operation of the DMS is still relatively informal.	Complete the development of the Document Management System and ensure that controls are implemented for the management of documentation. Ensure that, as appropriate, document in draft or under review are finalised and approved.	August 2015 August 2015	Yes – Access database currently used but being replaced by a formal doc management system HPRM,

B. Resolved during current Review period				
Reference (no,/yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Date resolved**	**Further action required (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**
18/2014, 19/2014, 20/2014	B3 / 8.1 Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system. The general intent of the Risk Management Policy (RMP) and Risk Management Guideline (RMG) has been applied in practice however, while there is evidence that the policies are understood there is no formal evidence that this has been maintained. In particular the Review noted that there was no formal application of the formal requirements of the RMP and RMG over recent years and of the asset risk analysis since 2010, even though sound practices have been maintained at an operational level.	Undertake a review of the Risk Management Policy and Risk Management Guideline to ensure they are current and up to date. Review the accountabilities and requirements of the Risk Management Policy and Risk Management Guideline to ensure they have been complied with. Evidence of ongoing compliance to be subsequently maintained. Regular staff training on risk management requirements to be undertaken with appropriate records being maintained.	June 2016	No – Refer:21 Kwinana Combined Cycle Power Station Steam Plant Risk and FMECA Analysis - V5.xlsm" Refer:37 8.0 NPK REG SAF 242 Risk Register Rev 4.xlsm" Refer:2 Asset Management System Manual NPK-COR-AM-MAN-001.pdf"
21/2014, 22/2014, 23/2014	B3 / 8.2 Risks are documented in a risk register and treatment plans are actioned and monitored. Risk registers were established at the commencement of operations in 2008 however have not been subsequently reviewed or updated, a review is now warranted. Where appropriate, risk treatment plans were put in place at the same time as the risk registers were established. While these plans involved an initial amount of action and monitoring there is no evidence that this has occurred on a As an observation it is noted that, within the risk evaluation matrix, the financial impact scale applicable to the differing levels of consequence/severity is considered too low for an operation with NPK's attributes. As a result, risks of all types are being assessed at a higher level of consequence than would normally be expected for this industry regular ongoing basis.	Undertake a review of the risk management process to ensure that it is relevant to the current plant operation and that it can be implemented. Undertake a review of all risk registers and risk treatment plans to ensure all identified risks remain current, no new risks have emerged and all appropriate risk treatment plans are in place, actioned and regularly monitored. Undertake a review of the financial impact scale used in the risk evaluation model to ensure it is aligned with industry norms.		No – As 18, 19, 20/2014 (EC 8.1)

B. Resolved during current Review period				
Reference (no,/yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Date resolved**	**Further action required (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**
10/2014 26/2014	B1 / 10.1 The financial plan states the financial objectives and strategies objectives and actions to achieve the objectives. The financial outcomes contained in the Annual Budget can reasonably be taken to be the financial objectives. However whilst the assumptions contained in the Annual Budget set out the assumed level of contract generation that will actually be required, the residual generation that will be made available to the market and the plant operating parameters to achieve this, they do not define specific plant operating strategies or actions that will be implemented as part of this process. For example, in the absence of stated strategies and actions, the pursuit of current year financial outcomes as per the Annual Budget may be to the long-term detriment of the plant. Whilst there is no evidence of this occurring in practice a broader and more clearly articulated approach to operating strategy would be beneficial assumptions contained in the Annual Budget set out the assumed level of contract generation that will actually be required, the residual generation that will be made available to the market and the plant operating parameters to achieve this, they do not define specific plant operating strategies or actions that will be implemented as part of this process. For example, in the absence of stated strategies and actions, the pursuit of current year financial outcomes as per the Annual Budget may be to the long-term detriment of the plant. Whilst there is no evidence of this occurring in practice a broader and more clearly articulated approach to operating strategy would be beneficial.	Within the Annual Budget clearly define and articulate the operating strategies that will be implemented in order to achieve financial objectives. This should be linked to the AMP planning process.	April 2017	No – Refer:8 NewGen Power Kwinana - Budget Presentation FY18.pptx" Refer:9 NPK FY18 Detailed Budget Pack FINAL.pdf"
27/2014	B2 / 10.4 The financial plan provides firm predictions on income for the next five years and reasonable indicative predictions beyond this period. The Annual Budget does not include any detail on the basis of how the year 2-5 projections have been determined and it is considered appropriate for this to be included in future budget documents.	Within the Annual Budget clearly define and articulate the assumptions applying to longer- term revenue projections in order that the level of reasonableness applicable to them can be determined.	April 2017	No – Refer:8 NewGen Power Kwinana - Budget Presentation FY18.pptx" Refer:9 NPK FY18 Detailed Budget Pack FINAL.pdf"
28/2014	A1 / 10.6	Variance commentary in monthly Finance	Aug 2014	No –

B. Resolved during current Review period				
Reference (no,/yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Date resolved**	**Further action required (Yes/No/Not Applicable) & Details of further action required including current recommendation reference if applicable**
	Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary. Variance reporting was considered to be of a high quality however could be enhanced by the inclusion of corrective operational and trading actions to be taken to recover lost ground if possible and where necessary	Management reports should identify corrective action that has been or will be taken where necessary.		Refer:11 NPK Business Services Reports monthly 2014 - 2017.docx"
29 /2014, 30/2014	B2 / 11.1 There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates. The capital expenditure planning process appears to be robust however it is compromised by the absence of a detailed five year forward view of expenditure to be incurred albeit the inclusion of four year major maintenance events does ensure that all significant expenditure items are captured. There is currently a misalignment between the Required Maintenance Reserve Account Balance Schedule and the timing of major maintenance events. Notwithstanding that the Maintenance Reserve Account currently appears to be overfunded and has been able to cover all actual planned maintenance costs to date this disparity should be remedied in order to provide certainty.	The capital expenditure plan within the Annual Budget needs to provide schedules for planned capital expenditure on maintenance on an annual basis for the current budget year and each of the ensuing 4 years to provide a 5 year forward view in total. Arrange for the Lenders Engineer to review and reset the Required Maintenance Reserve Account Balance Schedule to reflect the planned timing of major maintenance events.	April 2017	No – Refer:8 NewGen Power Kwinana - Budget Presentation FY18.pptx" Refer:9 NPK FY18 Detailed Budget Pack FINAL.pdf"
33/2014	B2 / 12.2 Independent reviews (e.g. internal audit) are performed of the asset management system. An independent review of the AMS was completed in August 2011 as part of the requirements of the licence. No other independent reviews were evident for the Review period.	The asset management system review process should include independent reviews.	Not known	No – Refer:35 6.0 Export PM Listing.xlsx" Refer: 36 6.1 Export 2017 PM Schedule.xlsx" include prompts for OEPA and ERA audits. AMP calls for internal audits.

C. Unresolved at end of the current review period.			
Reference (no. /yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Further action required (Yes/No/Not Applicable) & Details of further action required**
1/2014	B2 / 1.1 Asset management plan covers key requirements Whilst MEX provides the individual list of maintenance tasks, there is no evidence of the planning process, the decisions, reasons and formulation of a maintenance strategy. There is documentation demonstrating various aspects of an asset management plan however the Review did not find a comprehensive document dealing with the review of strategy at regular intervals. ‣ The Review did not find a clear definition and review of service levels and objectives within the asset management plan (AMP) documentation, the review of performance against those objectives, the results analysed and the resulting corrective actions clearly defined.	Prepare a suitable Asset Management Plan (AMP). The AMP should provide clear definition of measurable objectives and strategies implemented to achieve those objectives. The AMP should indicate the processes used to review plant performance and plan strategies and activities, manage the costs, risk and performance of the assets, the creation, acquisition or enhancement of assets, the utilisation, maintenance, replacement and disposal of assets; it should indicate the means to monitor performance and report it to management. The AMP should report on past performance.	No – (Issued post review period.) An extensive asset management plan has been prepared during the reporting period with the majority of documentation issued after the end of the audit period and as such performance cannot be assessed. The station has performed reliably and profitably throughout the reporting period with targets achieved and monthly reporting of operational and financial performance. Refer:2 Asset Management System Manual NPK-COR-AM-MAN-001.pdf"
2/2014	C2 / 1.2 Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning. There is a process however there is no formal documented description of the planning process, so that the scope, consideration of operating objectives, stakeholder needs	Planning process should be documented either in the AMS documentation or in a stand-alone procedure.	No – (Issued post review period.) As above
3/2014	B/NR / 1.3 Service levels are defined. Under the Tradeable Purchase Agreement the	Provide a clear and measurable definition of service levels. Review the definition of the plant objectives.	No – (Issued post review period.) KPI's are documented in Refer:4 Strategic Asset Management Plan NPK-COR-AM-PLN-002.pdf"

C. Unresolved at end of the current review period.			
Reference (no. /yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Further action required (Yes/No/Not Applicable) & Details of further action required**
	source of the electricity is not stipulated so that, if generation fails, electricity can be sourced elsewhere and the service levels maintained. However this will severely impact the internal performance and commercial viability of the asset. The Review did not find in the AMS documents or in the Business Services Reports clear information on quantifiable service levels and objectives.		
6/2014	C3 / 1.9 Plans are regularly reviewed and updated . The AMS document states that the Asset Life Plan is to be reviewed as part of the yearly business planning process and as part of a review of the production over the preceding 12 months, however there was no documentary evidence that a formal review had taken place since the issue date of the Asset Life Plan (July 2008) or during the Review period (the Review has noted that the Asset Life Plan was reviewed after the Review period, in September 2014). In general events may occur during the life of the plant that cannot be fully predicted. In addition the operation of the plant is subject to external factors which affect the operating regime which, in turn affects the life and maintenance requirements of the plant. This necessitates a review of the plant performance and operation at regular intervals, as well of a review of the strategies in place for the plant operation. External factors such as client	Document the process of review and updating of the asset management plan (AMP). The AMP needs to be reviewed and updated at regular intervals.	No – (Issued post review period.) No – (Issued post review period.) Refer:1 Asset Management Policy NPK-COR-AM-POL-001.pdf" Refer:2 Asset Management System Manual NPK-COR-AM-MAN-001.pdf" Policy review every 2yrs, AMP every year

C. Unresolved at end of the current review period.			
Reference (no. /yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Further action required (Yes/No/Not Applicable) & Details of further action required**
	demand, carbon policies, and environmental constraints can affect the use of the plant. The demand of external and internal change need to be addressed in reviews which need to be demonstrated formally so that a trail is available of strategy development. The reviews need to be carried out at regular intervals, say on an annual basis, due to the increased speed of change that is taking place.		
8/2014	B1 / 3.1 Logical security access controls appear adequate, such as passwords. Whilst there are processes in place for the review of plant performance, these processes are not clearly identified in the AMP documentation (or in procedures).	Whilst there are processes in place for the review of plant performance, these processes are not clearly identified in the AMP documentation (or in procedures). There should be a definition of the systematic monitoring and review of asset performance and a definition of the replacement/ disposal process in the AMP documentation and in procedures.	. No – (Issued post review period.) Refer:2 Asset Management System Manual NPK-COR-AM-MAN-001.pdf", Refer:4 Strategic Asset Management Plan NPK-COR-AM-PLN-002.pdf", Refer:20 IW159000-P2-CE-RPT-0001_0 NPK OoM Closure Cost Estimate - Basis of Estim....pdf"
-	B1 / 3.3 Disposal alternatives are evaluated. Refer to EC3.1 for finding on documentation of disposal process	Refer to recommendation 8/2014 at EC3.1	No – (Issued post review period.) As 8/2014 (EC 3.1)
-	B2 / 3.4 There is a replacement strategy for assets. The replacement strategy should be subject to a systematic review within the AMP review. This was not evident during the Review period and has been noted under EC3.1.	Refer to recommendation 8/2014 at EC3.1	No – (Issued post review period.) As 8/2014 (EC 3.1)
-	B1 / 6.1 Maintenance policies and procedures are documented and linked to service levels required.	Refer to recommendation at items EC1.1 and EC1.2	No – (Issued post review period.) As 1/2014 (EC 1.1)

C. Unresolved at end of the current review period.			
Reference (no. /yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Further action required (Yes/No/Not Applicable) & Details of further action required**
	Up to date documentation and review of maintenance strategies, which is expected in an AMP, is not available. This finding has been documented in EC1.1 and EC1.2		
16/2014	B1 / 7.3 Logical security access controls appear adequate, such as passwords. Control of access to AMIS including responsibility for authorisations and process is not documented.	Control of access to AMIS including responsibility and process should be documented.	No – (Issued post review period.) Refer:18 Business Continuity Plan NPK-COR-AM-PLN-001.pdf"
17/2014	C1 / 7.5 Data backup procedures appear adequate and backups are tested. There was no evidence to show that backups are tested; the backup procedure was not documented.	Document the Asset Management System data backup and backup testing procedures. Ensure there is verification and evidence of back up integrity.	No – (Issued post review period.) As 16/2014 (EC 7.3)
24/2014	B3 / 8.3 The probability and consequences of asset failure are regularly assessed. Probability and consequences of asset failure were assessed when the initial risk registers were established in 2008 and were further reviewed in 2010. No further systematic reviews were found for the entire plant.	Implement a process for ensuring the probability and consequences of asset failure are regularly assessed and maintain a record of such assessments having been made.	No – (Issued post review period.) Refer:18 Business Continuity Plan NPK-COR-AM-PLN-001.pdf" Refer:21 Kwinana Combined Cycle Power Station Steam Plant Risk and FMECA Analysis - V5.xlsm" Refer:2 Asset Management System Manual NPK-COR-AM-MAN-001.pdf"
25/2014	B1 / 9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks. No Contingency/Business Continuity Plans are in place to cover higher risks such as loss of gas supplies, loss of IT infrastructure, loss of office facilities.	Address the need for higher level Contingency Plans/ Business Continuity Plans and implement as necessary.	No – (Issued post review period.) Refer:18 Business Continuity Plan NPK-COR-AM-PLN-001.pdf"
31/2014,	C3 / 12.1	Document the process for review of the asset	No – (Issued post review period.)

C. Unresolved at end of the current review period.			
Reference (no. /yr)	**(Asset management effectiveness rating / AMS Component & Criteria / details of issue)**	**Auditor's recommendation or action taken**	**Further action required (Yes/No/Not Applicable) & Details of further action required**
32/2014	A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current. While aspects of the asset management system and of the asset management plan were subject to review, there has been no formal review of the AMS or of the AMP during the Review period. There was no evidence that a structured review of the AMS has been carried out at regular intervals.	management system (AMS) and the asset management plan (AMP). Carry out a formal review of the AMS and the AMP. Update the AMS and the AMP as per review findings. (Refer to EC 1.1 for additional recommendation; a review of the above may also require a review and update of the Asset Life Plan).	As 6/2014 (EC 1.9)

3.2 2017 Post Review Implementation Plan

As stipulated in section 11.8 of the Audit Guidelines – Electricity and Gas Licences (April 2014), the Review Team notes that the Asset Management Review Post Implementation Plan does not form part of the Review Opinion. It is the responsibility of the licensee to ensure actions are undertaken as determined by NPK.

3.3 2017 Review Asset System Deficiencies/Recommendations

Table 7 Current Review Asset System Deficiencies/Recommendations.

A. Resolved during current Review period			
Ref.	**Asset System Deficiency** **(Rating / Asset Management System Component & Effectiveness Criteria / Details of Asset System Deficiency)**	**Date Resolved (& management action taken)**	**Auditors comments**
None			

B. Unresolved at end of current Review period			
Ref. (no./year)	**Asset System Deficiency** **(Rating / Asset Management System Component & Effectiveness Criteria / Details of Asset System Deficiency)**	**Auditors' Recommendation**	**Management action taken by end of Review period**
01/2017	B1 / 1.5 **Key process - Asset Management Information System (MIS)** Lifecycle costs of owning and operating assets are assessed	Consideration could be given to using a different program instead of the excel database as a means for establishing the Lifecycle Costing. Whilst it is thorough and an effective tool. Issues with multi user, versions control and referencing of documents that can be obsolete are some potential issues that have been identified.	The recommendation has not been addressed yet.
02/2017	B2 / 7.1 **Key process - Asset Management Information System (MIS)** Adequate system documentation for users and IT operators	Document management system to be replaced with HPRM.	The recommendation has not been addressed yet.
03/2017	B2 / 7.5	Restore process needs to be developed and tested	The recommendation has not been addressed yet.

B. Unresolved at end of current Review period			
Ref. (no./year)	**Asset System Deficiency** **(Rating / Asset Management System Component & Effectiveness Criteria / Details of Asset System Deficiency)**	**Auditors' Recommendation**	**Management action taken by end of Review period**
	Key process - Asset Management Information System (MIS) Data backup procedures appear adequate and backups are tested		
04/2017	B1 / 8.2 **Key Process - Risk Management** Risks are documented in a risk register and treatment plans are actioned and monitored	Monitor the use of the risk register and simplify if necessary.	The recommendation has not been addressed yet.
05/2017	B2 / 9.1 **Key Process - Contingency Planning** *Contingency plans document the steps to deal with the unexpected failure of an asset.*	Contingency plans should be tested where possible.	The recommendation has not been addressed yet.
06/2017	B1/ 12.1 **Key Process – Review of AMS** A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current	Ensure that annual review of the AMP is implemented.	The recommendation has not been addressed yet.
07/2017	**All**	Formally issue revised AMP documentation.	Documents were issued in September 2017, post review period.

APPENDIX 1

ASSET MANAGEMENT REVIEW

NEWGEN POWER KWINANA PTY LTD

OCTOBER 2017

Introduction

The majority of areas for improvement identified in the 2011-14 Asset Management Review concerned documentation rather than performance of the plant.

During the 2014-17 review period the plant has operated reliably and efficiently and any issues and failures have been addressed in a proficient manner.

A comprehensive documented Asset Management System has been prepared, a lot of which was still "under review" at the end of the review period, 31st July 2017, and not issued until 1st September 2017. Nevertheless the preparation of this documentation took place during the review period and to a large extent reflects processes that were already being applied throughout the review period; ongoing monitoring, reporting and analysis of performance, planning and employing good engineering and financial practice as part of continuous improvement.

The plant is one of the most efficient in the SWIS system, has high utilisation and has proven profitable and it is in the owner's interest to ensure this continues to be the case and their asset management reflects this objective.

Table 8 Effectiveness Criteria Descriptors.

1	**Key Process - Asset Planning** *Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).*	**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.*
1.1	Asset management plan covers key requirements	
1.2	Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	
1.3	Service levels are defined	
1.4	Non-asset options (e.g. demand management) are considered	
1.5	Lifecycle costs of owning and operating assets are assessed	
1.6	Funding options are evaluated	
1.7	Costs are justified and cost drivers identified	
1.8	Likelihood and consequences of asset failure are predicted	
1.9	Plans are regularly reviewed and updated	
2	**Key Process - Asset creation/acquisition** *Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.*	**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.*
2.1	Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions	
2.2	Evaluations include all life-cycle costs	
2.3	Projects reflect sound engineering and business decisions	
2.4	Commissioning tests are documented and completed	
2.5	Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood	
3	**Key process - Asset disposal** *Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms*	**Outcome** *Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.*
3.1	Under-utilised and under-performing assets are identified as part of a regular systematic review process	
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	

4	**Key Process - Environmental analysis** *Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.*	**Outcome** *The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements.*
4.1	Opportunities and threats in the system environment are assessed	
4.2	Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	
4.3	Compliance with statutory and regulatory requirements	
4.4	Achievement of customer service levels	
5	**Key Process - Asset operations** *Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.*	**Outcome** *Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.*
5.1	Operational policies and procedures are documented and linked to service levels required	
5.2	Risk management is applied to prioritise operations tasks	
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	
5.4	Operational costs are measured and monitored	
5.5	Staff resources are adequate and staff receive training commensurate with their responsibilities	

6	**Key process - Asset maintenance** *Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.*	**Outcome** *Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.*
6.1	Maintenance policies and procedures are documented and linked to service levels required	
6.2	Regular inspections are undertaken of asset performance and condition	
6.3	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	
6.4	Failures are analysed and operational/maintenance plans adjusted where necessary	
6.5	Risk management is applied to prioritise maintenance tasks	
6.6	Maintenance costs are measured and monitored	
7	**Key process - Asset Management Information System (MIS)** *An asset management information system is a combination of processes, data and software that support the asset management functions.*	**Outcome -** *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.*
7.1	Adequate system documentation for users and IT operators	
7.2	Input controls include appropriate verification and validation of data entered into the system	
7.3	Logical security access controls appear adequate, such as passwords	
7.4	Physical security access controls appear adequate	
7.5	Data backup procedures appear adequate and backups are tested	
7.6	Key computations related to licensee performance reporting are materially accurate	
7.7	Management reports appear adequate for the licensee to monitor licence obligations	
8	**Key Process - Risk Management** *Risk management involves the identification of risks and their management within an acceptable level of risk.*	**Outcome** *An effective risk management framework is applied to manage risks related to the maintenance of service standards*
8.1	Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system	
8.2	Risks are documented in a risk register and treatment plans are actioned and monitored	
8.3	The probability and consequences of asset failure are regularly assessed	
9	**Key Process - Contingency Planning** *Contingency plans document the steps to deal with the unexpected failure of an asset.*	**Outcome-** *Contingency plans have been developed and tested to minimise any significant disruptions to service standards.*
9.1	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	
10	**Key Process - Financial Planning** *The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term.*	**Outcome** *A financial plan that is reliable and provides for long-term financial viability of services*
10.1	The financial plan states the financial objectives and strategies and actions to achieve the objectives	
10.2	The financial plan identifies the source of funds for capital expenditure and recurrent costs	
10.3	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	
10.4	The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period	
10.5	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	
10.6	Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary	

11	**Key Process - Capital Expenditure Planning** *The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years.* *Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10*	**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.*

	years, preferably longer. Projections over the next five years would usually be based on firm estimates.	
11.1	There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates	
11.2	The plan provide reasons for capital expenditure and timing of expenditure	
11.3	The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	
11.4	There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned	
12	**Key Process - Review of AMS** *The asset management system is regularly reviewed and updated*	**Outcome** *Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency.*
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	
12.2	Independent reviews (e.g. internal audit) are performed of the asset management system	

Table 9 Audit Review Ratings and Recommendations.

<table>
<tr><td rowspan="2">1.</td><td>Key Process - Asset Planning
Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).</td><td rowspan="2">Asset management process and policy definition adequacy rating

B</td><td rowspan="2">Asset management performance rating

1</td></tr>
<tr><td>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.</td></tr>
<tr><td colspan="2">Interviewees:
Mark Hammond Power Station Manager NewGen Power Pty Ltd.
Ralph Lochbuehler Operations Manager NewGen Power Pty Ltd
Kris Roots Power Station Manager NewGen Power Pty Ltd
Tim Harrison Maintenance Manager NewGen Power Pty Ltd</td><td colspan="2">Relevant documentation:
1 Asset Management Policy NPK-COR-AM-POL-001.pdf
2 Asset Management System Manual NPK-COR-AM-MAN-001.pdf
3 OLD AMS Newgen Kwinana August 2008 ver(4).pdf
4 Strategic Asset Management Plan NPK-COR-AM-PLN-002.pdf
5 OLD Kwinana LIFE PLAN ver04.pdf
6 1707B1 Business Performance Summary for Quarter ending Jun-17.pptx
7 NewGen Kwinana Power Station Life Cycle Model - V4N.xlsm
8 NewGen Power Kwinana - Budget Presentation FY18.pptx
9 NPK FY18 Detailed Budget Pack FINAL.pdf
10 Steam Turbine Asset Management Plan NPK-COR-AM-PLN-001.pdf
12 1707B3 Steam Turbine Generator Inspection Timing.pdf
15 Health & Safety and Environmental Management Plan NPK-HSE-PLN-002.pdf
16 Health Safety and Environment Policy SSCP-PL-CA-006.pdf
22 NPK AP FIN 287 Administration Procedure Fixed Asset Accounting Capitalisation Policy Rev1 (Executed).pdf
28 NPK MP MAI 152 Maintenance Procedure Day to Day Maintenance Management Rev2.pdf
31 Project Investment Appraisal Procedure NPK-FA-PRO-001.pdf
43 43 28092016 NPK Operating Plan (FINAL).pdf</td></tr>
</table>

Criteria Effectiveness			Post Review Audit Priority						
	Evidence Ref#	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
1.1 Asset management plan covers key requirements	1, 2, 3, 4, 5, 6, 8, 9	The AMP covers all the requirements. The plant has operated reliably, efficiently and met stakeholders' requirements.	C	2	MEDIUM	S	4	B	1
1.2 Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	1, 2, 3, 4, 5, 6, 8, 9, 11, 43	Reliability is paramount and maintenance is based on OEM recommendations, condition monitoring and feedback from users groups. Outages are planned for low price periods to maximise returns and minimise stakeholder's risks. Planning looks ahead to end of life.	C	2	MEDIUM	S	4	B	1
1.3 Service levels are defined	1, 2, 3, 4, 5, 6, 8, 9, 11, 29, 43	System Management and the supply contracts define service levels. Key result areas, KRA, and regular reporting of performance statistics are used.	C	2	MEDIUM	S	4	B	1
1.4 Non-asset options (e.g. demand management) are considered	1, 2, 3, 4, 5, 6, 8, 9	DM is not applicable to this business which gets revenue through generation.	B	1	LOW	Not Assessed	5	B	Not Assessed
1.5 Lifecycle costs of owning and operating assets are assessed	1, 2, 3, 4, 5, 6, 7, 8, 9	Life cycle costing was employed for the original development and is used for new works, eg the GT uprate resulted in improved efficiency.	C	2	MEDIUM	S	4	B	1
1.6 Funding options are evaluated	1, 2, 3, 4, 5, 6, 8, 9	Self-funded with a proportion of revenue allocated to the maintenance reserve account for operating and capital works.	C	2	MEDIUM	S	4	B	1
1.7	1, 2, 3, 4, 5, 6, 8, 9, 11	Procurement process require several quotes or tender for larger contracts. Service contract with GE is in place	C	2	MEDIUM	S	4	B	1

Costs are justified and cost drivers identified		and budgeted for. Gas is sourced through long term contracts, the spot market and swaps.							
1.8 Likelihood and consequences of asset failure are predicted	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 21	Detailed risk assessments are maintained and contingency plans in place. Plant can be operated at reduced output in GT mode only. Loss of production insurance is in place. Participate in GT, HRSG and ST users groups.	C	2	MEDIUM	S	4	B	1
1.9 Plans are regularly reviewed and updated	1, 2, 4, 5, 6, 8, 9, 10, 11, 14, 43	The AMP is continually monitored and updated annually. Maintenance history retained in Mex. Life cycle costing considers GT, HRSG and ST services and is updated as required.	B	1	LOW	S	5	B	1

Comments & Recommendations

Adequacy rating B as the revised AMP documentation was still "under review" in the review period and issued in September 2017.

The GT upgrade in Dec 2015 indicates the long term planning, where although only relatively small improvements in output and efficiency were obtained the extension of service intervals resulted in one less major service in the operational lifetime of the project with large cost savings.

Consideration could be given to using a different program instead of the excel database as a means for establishing the Lifecycle Costing. Whilst it is thorough and an effective tool. Issues with multi user, versions control and referencing of documents that can be obsolete are some potential issues that have been identified.

2.	**Key Process - Asset creation/acquisition** *Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.* **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.*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **1**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Operations Manager	NewGen Power Pty Ltd
Kris Roots	Power Station Manager	NewGen Power Pty Ltd
Tim Harrison	Maintenance Manager	NewGen Power Pty Ltd

Relevant documentation:

1	Asset Management Policy NPK-COR-AM-POL-001.pdf
2	Asset Management System Manual NPK-COR-AM-MAN-001.pdf
3	OLD AMS Newgen Kwinana August 2008 ver(4).pdf
4	Strategic Asset Management Plan NPK-COR-AM-PLN-002.pdf
5	OLD Kwinana LIFE PLAN ver04.pdf
6	1707B1 Business Performance Summary for Quarter ending Jun-17.pptx
7	NewGen Kwinana Power Station Life Cycle Model - V4N.xlsm
8	NewGen Power Kwinana - Budget Presentation FY18.pptx
9	NPK FY18 Detailed Budget Pack FINAL.pdf
10	Steam Turbine Asset Management Plan NPK-COR-AM-PLN-001.pdf
11	NPK Business Services Reports monthly 2014 - 2017.docx
15	Health & Safety and Environmental Management Plan NPK-HSE-PLN-002.pdf
17	Management of Change NPK-COR-ENG-PRO-003.pdf
19	Incident Reports 01.07.14 - 30.06.17.pdf
26	OLD NPK POL ADM 106 ERM Policy Manual Rev0.pdf
32	SD-5_14KP08_14SSC05_Operator Services Agreement NGPK SSCP dated 30-09-14....pdf
36	6.1 Export 2017 PM Schedule.xlsx

Criteria Effectiveness			Post Review Audit Priority						
	Evidence Ref#	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
2.1 Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions	1, 2, 3, 6, 7, 8, 9, 10, 11, 17	Alstom MXL upgrade contract performed during C2 service outage resulting in slight increase in output and an efficiency gain resulting in fuel cost savings	C	2	MEDIUM	S	4	B	1
2.2 Evaluations include all life-cycle costs	1, 2, 4, 5, 7, 8, 9, 10, 11, 17	Life–cycle costs are evaluated as part of the asset acquisition process and the maintenance management process e.g. MXL upgrade.	C	1	LOW	S	5	B	1
2.3 Projects reflect sound engineering and business decisions	2, 6, 7, 10, 11, 12, 17	The OEM and/or other reputable suppliers are normally involved with engineering decisions and implementation e.g. MXL upgrade. Reputable contractors are used.	C	2	MEDIUM	S	4	B	1
2.4 Commissioning tests are documented and completed	2, 10, 11	Capacity tests are carried twice a year to meet System Management requirements. Alstom MXL upgrade included several days testing/commissioning. Commissioning report was prepared (Ref 11, Dec 2015) Governor testing was reported (ref 11, Nov 2014)	C	2	MEDIUM	S	4	B	1
2.5 Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood	2, 3, 4, 5, 6, 8, 9, 11, 15, 19, 26, 32, 36	Regulatory reporting and testing requirement are incorporated in MEX and reported in the monthly reports.	C	2	MEDIUM	S	4	B	1
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still “under review” in the review period and issued in September 2017.									

3.	**Key process - Asset disposal** *Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms* **Outcome** *Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **1**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Operations Manager	NewGen Power Pty Ltd
Kris Roots	Power Station Manager	NewGen Power Pty Ltd
Tim Harrison	Maintenance Manager	NewGen Power Pty Ltd

Relevant documentation:

2 Asset Management System Manual NPK-COR-AM-MAN-001.pdf
3 OLD AMS Newgen Kwinana August 2008 ver(4).pdf
4 Strategic Asset Management Plan NPK-COR-AM-PLN-002.pdf
5 OLD Kwinana LIFE PLAN ver04.pdf
6 1707B1 Business Performance Summary for Quarter ending Jun-17.pptx
7 NewGen Kwinana Power Station Life Cycle Model - V4N.xlsm
8 NewGen Power Kwinana - Budget Presentation FY18.pptx
9 NPK FY18 Detailed Budget Pack FINAL.pdf
10 Steam Turbine Asset Management Plan NPK-COR-AM-PLN-001.pdf
11 NPK Business Services Reports monthly 2014 - 2017.docx
12 1707B3 Steam Turbine Generator Inspection Timing.pdf
17 Management of Change NPK-COR-ENG-PRO-003.pdf
20 IW159000-P2-CE-RPT-0001_0 NPK OoM Closure Cost Estimate - Basis of Estim....pdf
22 NPK AP FIN 287 Administration Procedure Fixed Asset Accounting Capitalisation Policy Rev1 (Executed).pdf
35 6.0 Export PM Listing.xlsx
36 6.1 Export 2017 PM Schedule.xlsx

Criteria Effectiveness			Post Review Audit Priority						
	Evidence Ref#	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
3. 1 Under-utilised and under-performing assets are identified as part of a regular systematic review process	2, 4, 5, 6, 8, 9, 10, 11, 12, 17, 35, 36	Performance is monitored by the DCS and reported in monthly reports with variances noted e.g. HRSG tube leaks	C	2	MEDIUM	S	4	B	1
3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	2, 4, 5, 6, 8, 9, 10, 11, 12, 17, 35, 36	HRSG tube leaks reported in detail in monthly report with rectification measures.	C	2	MEDIUM	S	4	B	1
3.3 Disposal alternatives are evaluated	2, 3, 20	An end of life cost estimate has been prepared, until then only minor parts will be disposed of, some will be exchanged or refurbished.	B	1	LOW	S	5	B	1
3.4 There is a replacement strategy for assets	2, 3, 7, 8, 9, 10, 22	A stock of vulnerable spares is held; GT users forum and OEM provide back up.	C	2	MEDIUM	S	4	B	1
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still “under review” in the review period and issued in September 2017. There are still over 20 operational years remaining.									

4.	**Key Process - Environmental analysis** *Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.* **Outcome** *The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements.*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **1**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Operations Manager	NewGen Power Pty Ltd
Kris Roots	Power Station Manager	NewGen Power Pty Ltd
Tim Harrison	Maintenance Manager	NewGen Power Pty Ltd

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43 43 28092016 NPK Operating Plan (FINAL).pdf

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4.1 Opportunities and threats in the system environment are assessed	1, 2, 6, 7, 8, 9, 11, 14	Currently generation costs are competitive, fuel deals are ongoing. Carbon Tax was addressed in negotiations with Synergy. Trading section follows the market.	C	1	LOW	S	5	B	1
4.2 Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	2, 3, 4, 5, 6, 10, 11, 14, 15, 18, 29, 32, 33, 34, 43	Performance standards; availability, capacity factor, events etc. KRAs are included in monthly reports with discussion as required.	C	2	MEDIUM	S	4	B	1
4.3 Compliance with statutory and regulatory requirements	1, 2, 3, 4, 5, 6, 11, 15, 19, 23, 26, 32, 35, 36	Statutory and regulatory requirements are monitored in MEX or by Trading and reported in monthly reports. No major non-compliances were identified. Minor, eg High Cl in seawater discharge on 7/12/16 was promptly addressed and reported to the DER.	B	2	MEDIUM	S	4	B	1
4.4 Achievement of customer service levels	2, 4, 5, 6, 11, 19, 23, 26, 29, 32, 34	Customer service levels are monitored internally and by System Management and documented in the monthly reports including safety, financial, availability, reliability, performance and environmental	C	2	MEDIUM	S	4	B	1

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Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still "under review" in the review period and issued in September 2017.									

5.	**Key Process - Asset operations** *Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.* **Outcome** *Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **1**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Operations Manager	NewGen Power Pty Ltd
Kris Roots	Power Station Manager	NewGen Power Pty Ltd
Tim Harrison	Maintenance Manager	NewGen Power Pty Ltd

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12	1707B3 Steam Turbine Generator Inspection Timing.pdf
13	170421 NPK MAT MAI RASCI Matrix 2017 April 21.xlsx
14	Emergency Response Plan NPK-HSE-PLN-001.pdf
15	Health & Safety and Environmental Management Plan NPK-HSE-PLN-002.pdf
18	Business Continuity Plan NPK-COR-AM-PLN-001.pdf
19	Incident Reports 01.07.14 - 30.06.17.pdf
21	Kwinana Combined Cycle Power Station Steam Plant Risk and FMECA Analysis - V5.xlsm
24	OLD Corporate Risk Management Guideline.pdf
26	OLD NPK POL ADM 106 ERM Policy Manual Rev0.pdf
28	NPK MP MAI 152 Maintenance Procedure Day to Day Maintenance Management Rev2.pdf
29	NPK Business Services Report May 2017.docx
32	SD-5_14KP08_14SSC05_Operator Services Agreement NGPK SSCP dated 30-09-14....pdf
34	Safety Environmental Operational monthly Minutes 2014-17.pdf
35	6.0 Export PM Listing.xlsx
36	6.1 Export 2017 PM Schedule.xlsx
37	8.0 NPK REG SAF 242 Risk Register Rev 4.xlsm
38	Management of Maintenance NPK-COR-MAI-PRO-001.pdf
43	43 28092016 NPK Operating Plan (FINAL).pdf

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			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
5.1 Operational policies and procedures are documented and linked to service levels required	1, 2, 4, 6, 7, 8, 9, 10, 13, 14, 15, 18, 19, 26, 28, 32, 34, 38, 43	AMP is comprehensive addressing service levels with regular reporting and review.	B	2	MEDIUM	S	4	B	1
5.2 Risk management is applied to prioritise operations tasks	1, 2, 3, 4, 8, 9, 10, 12, 14, 21, 24, 32, 35, 36, 37, 38	Maintenance work is programmed through MEX based on historical performance, OEM recommendations and condition monitoring. OEM manufacturers and GT users Group provide regular updates on similar GT's performance. Trading is risk based and regularly reviewed. HRSG tube leaks was an example of the application of risk management. The leak was detected, plant shut down and source of leak found, risk assessed and the plant restarted and run for 7 days whilst rectification was planned	B	1	LOW	S	5	B	1

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		and a repair made. (Ref 11 Feb 2016)							
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	2, 3, 10, 32, 36	MEX has records of assets, history, documentation and maintenance requirements. New assets are added to MEX. The KKS Power Plant Identification System is used. Drawings are stored on the server. The system has worked effectively.	C	2	MEDIUM	S	4	B	1
5.4 Operational costs are measured and monitored	2, 3, 4, 5, 6, 7, 8, 9, 11, 29, 32, 43	Operational costs and revenue are included in the monthly reports.	C	2	MEDIUM	S	4	B	1
5.5 Staff resources are adequate and staff receive training commensurate with their responsibilities	2, 8, 9, 13, 15, 26, 28, 32, 34	Training is reported in the monthly reports and staff have considerable expertise and experience. The power station is well staffed.	B	2	MEDIUM	S	4	B	1
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still "under review" in the review period and issued in September 2017.									

6.	**Key process - Asset maintenance** *Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.* **Outcome** *Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **1**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Operations Manager	NewGen Power Pty Ltd
Kris Roots	Power Station Manager	NewGen Power Pty Ltd
Tim Harrison	Maintenance Manager	NewGen Power Pty Ltd

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12	1707B3 Steam Turbine Generator Inspection Timing.pdf
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24	OLD Corporate Risk Management Guideline.pdf
28	NPK MP MAI 152 Maintenance Procedure Day to Day Maintenance Management Rev2.pdf
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6.1 Maintenance policies and procedures are documented and linked to service levels required	2, 3, 4, 10, 15, 17, 23, 28, 32	Maintenance plans, policy and procedures are based on OEM recommendations, historical records and condition monitoring. Maintenance intervals are based on EOH where actual operating hours are the dominant input.	B	2	MEDIUM	S	4	B	1
6.2 Regular inspections are undertaken of asset performance and condition	2, 3, 4, 5, 10, 32, 34, 35, 36	Continuous monitoring by the DCS tracks performance of the GT, ST, HRSG and balance of plant. OEM recommended inspections are planned and implemented.	B	2	MEDIUM	S	4	B	1
6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	2, 3, 10, 12, 13, 14, 28, 32, 34, 35, 36	Maintenance of the plant is planned and reported in the Monthly Reports. Work orders are monitored in MEX and reported. The last main inspection was on schedule but the outage overran due to unforeseen corrective action being required.	B	2	MEDIUM	S	4	B	1

6.4 Failures are analysed and operational/maintenance plans adjusted where necessary	2, 4, 5, 6, 10, 12, 20, 32	Failures are analysed and responded to and reported in the monthly reports. Expert advice is called on as required. Maintenance and/or operational plans are modified as required.	C	2	MEDIUM	S	4	B	1
6.5 Risk management is applied to prioritise maintenance tasks	1, 2, 4, 5, 6, 10, 12, 15, 20, 24, 32, 34, 38	Major inspections are planned well ahead to allow for procurement of parts. Day to day maintenance tasks are programmed and monitored via MEX. Corrective maintenance is prioritised on a risk basis, e.g. HRSG tube leaks.	C	2	MEDIUM	S	4	B	1
6.6 Maintenance costs are measured and monitored	2, 3, 4, 5, 7, 10, 12, 28, 32, 34, 38, 43	Maintenance costs for materials and contractors are monitored in MEX and reported in monthly reports.	C	2	MEDIUM	S	4	B	1
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still “under review” in the review period and issued in September 2017.									

7.	**Key process - Asset Management Information System (MIS)** *An asset management information system is a combination of processes, data and software that support the asset management functions.* **Outcome** *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.*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **2**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Operations Manager	NewGen Power Pty Ltd
Kris Roots	Power Station Manager	NewGen Power Pty Ltd
Tim Harrison	Maintenance Manager	NewGen Power Pty Ltd

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19	Incident Reports 01.07.14 - 30.06.17.pdf
23	NPK Compliance requirement schedule.pdf
26	OLD NPK POL ADM 106 ERM Policy Manual Rev0.pdf
27	Outline Project Evaluation Form NPK-FA-FRM-001.pdf
28	NPK MP MAI 152 Maintenance Procedure Day to Day Maintenance Management Rev2.pdf
32	SD-5_14KP08_14SSC05_Operator Services Agreement NGPK SSCP dated 30-09-14....pdf
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7.1 Adequate system documentation for users and IT operators	2, 18, 26, 27, 32, 34	OEM manuals are comprehensive, there is a GE support contract in place. Staff have been retained from the construction phase. The Access document management system used doesn't ensure current version is being viewed, this is being replaced with HPRM doc management system.	B	2	MEDIUM	S	4	B	2
7.2 Input controls include appropriate verification and validation of data entered into the system	2, 8, 9, 32	Data is collected by the DCS and reported. Availability and capacity is broadcast to System Management via the DCS.	B	1	LOW	S	5	B	1
7.3 Logical security access controls appear adequate, such as passwords	2, 8, 9, 18, 32	Computer access is limited to staff and passwords are in place. DCS is isolated from the outside world; such as the internet. Firewalls and virus protection are in place.	B	2	MEDIUM	S	4	B	1
7.4 Physical security access controls appear adequate	2, 18, 32	The power station is located on a site next to Synergy's Cockburn and Kwinana power station with a shared main entrance. NPK area is separately cordoned off within the shared area. Station is manned by at least two staff 24/7	B	2	MEDIUM	S	4	B	1

7.5 Data backup procedures appear adequate and backups are tested	2, 18, 32	Server backed up nightly. DCS is isolated and back up is triplicated. Risk review carried out and restore process still being developed.	C	2	MEDIUM	S	4	B	2
7.6 Key computations related to licensee performance reporting are materially accurate	2, 7, 23, 32	Monitoring of availability and capacity to AEMO is via the DCS. Electrical energy transfer between NPK and the SWIS is with Western Power calibrated duplicate metering.	B	2	MEDIUM	S	4	B	1
7.7 Management reports appear adequate for the licensee to monitor licence obligations	2, 6, 11, 15, 18, 19, 23, 28, 32	Regulatory reporting is initiated in MEX and the DCS and was carried out in a timely manner during the reporting period.	C	1	LOW	S	5	B	1
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still "under review" in the review period and issued in September 2017. Document management system to be replaced with HPRM. Restore process needs to be developed and tested.									

8.	**Key Process - Risk Management** *Risk management involves the identification of risks and their management within an acceptable level of risk.* **Outcome** *An effective risk management framework is applied to manage risks related to the maintenance of service standards*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **1**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Operations Manager	NewGen Power Pty Ltd
Kris Roots	Power Station Manager	NewGen Power Pty Ltd
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8.1 Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system	1, 2, 3, 4, 5, 8, 9, 10, 12, 18	Risk management is integral with the management and safety policies. Contingency planning, service contract with GE and the GT users forum reduce risks	B	2	MEDIUM	S	4	B	1
8.2 Risks are documented in a risk register and treatment plans are actioned and monitored	2, 3, 4, 8, 9, 10, 12, 15, 18, 19, 24, 37	Risks have been assessed during the reporting period and summarised in the monthly reports. A comprehensive Excel spreadsheet risk management process/register has been developed. This was adapted for Newgen's use in June 2017 and could be over complex and hence not maintained. Recommend that it be reviewed after some experience has been gained.	B	2	MEDIUM	S	4	B	1
8.3 The probability and consequences of asset failure are regularly assessed	2, 3, 4, 10, 12, 18	The probability and consequences of asset failure have been reviewed.	B	2	MEDIUM	S	4	B	1
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still "under review" in the review period and issued in September 2017. Monitor the use of the risk register and simplify if necessary.									

9.	**Key Process - Contingency Planning** *Contingency plans document the steps to deal with the unexpected failure of an asset.* **Outcome-** *Contingency plans have been developed and tested to minimise any significant disruptions to service standards.*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **2**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Operations Manager	NewGen Power Pty Ltd
Kris Roots	Power Station Manager	NewGen Power Pty Ltd
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9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	2, 3, 4, 10, 12, 14, 18	The contingency plan was in final stages of preparation during the reporting period. It was finalised in September 2017. Included is an "Opportunities for improvement and action plan" in which testing and reviewing of components of the plan are identified. Although not a member of KIC NPK are associate members and liaise and co-operate with them. Duplication of most critical BoP items and triple DCS. Insured for loss of production. Good relationship with Synergy re shared facilities; site access, cooling water.	B	2	MEDIUM	S	4	B	2
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still "under review" in the review period and issued in September 2017. Contingency plans should be tested where possible.									

10.	**Key Process - Financial Planning** *The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term.* **Outcome** *A financial plan that is reliable and provides for long-term financial viability of services*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **1**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
James Hyland	Finance Controller	NewGen Power Pty Ltd
Jacqui Passamani	Accountant	NewGen Power Pty Ltd

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10.1 The financial plan states the financial objectives and strategies and actions to achieve the objectives	2, 4, 5, 6, 8, 9, 11, 12, 22, 32, 40, 41, 43	Budget Plan, prepared annually with a 5yr forward budget with P&L, balance, risks, strategies and past performance.	C	1	LOW	S	5	B	1
10.2 The financial plan identifies the source of funds for capital expenditure and recurrent cost	2, 4, 8, 9, 32	Capital expenditure taken from the Maintenance Reserve Account that is funded from earnings.	C	1	LOW	S	5	B	1
10.3 The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	2, 3, 4, 6, 7, 8, 9, 10, 11, 32, 43	Financials are reported in Monthly Reports with operating costs, P&L and Balance actuals compared against budgeted. Any variances are investigated. Budget Plan, prepared annually with a 5yr forward budget with P&L, balance, risks, strategies and past performance.	C	1	LOW	S	5	B	1
10.4 The financial plan provide firm predictions on income for the next five years and reasonable	2, 3, 4, 5, 7, 8, 9, 10, 32	Budget prepared annually with a forward budget based on 5 years as basis. Revenue based on reserve capacity rate set by AEMO. Gas derived from various sources.	C	1	LOW	S	5	B	1

indicative predictions beyond this period									
10.5 The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	4, 5, 7, 8, 9, 10, 11, 12, 20, 27, 30, 31, 32, 43	O&M, admin and overheads are incorporated in the plan together with forecast capital expenditure. Major services are costed through to the end of the project.	B	1	LOW	S	5	B	1
10.6 Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary	2, 4, 6, 8, 9, 11, 28, 32, 40, 41, 43	Financials are reported in Monthly Reports with operating costs, P&L and Balance actuals compared against budgeted. Any variances are investigated.	C	1	LOW	S	5	B	1
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still "under review" in the review period and issued in September 2017.									

11.	**Key Process - Capital Expenditure Planning** *The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years.* *Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer.* *Projections over the next five years would usually be based on firm estimates.* **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.*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **1**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
James Hyland	Finance Controller	NewGen Power Pty Ltd
Jacqui Passamani	Accountant	NewGen Power Pty Ltd

Relevant documentation:

2	Asset Management System Manual NPK-COR-AM-MAN-001.pdf
4	Strategic Asset Management Plan NPK-COR-AM-PLN-002.pdf
5	OLD Kwinana LIFE PLAN ver04.pdf
6	1707B1 Business Performance Summary for Quarter ending Jun-17.pptx
7	NewGen Kwinana Power Station Life Cycle Model - V4N.xlsm
8	NewGen Power Kwinana - Budget Presentation FY18.pptx
9	NPK FY18 Detailed Budget Pack FINAL.pdf
10	Steam Turbine Asset Management Plan NPK-COR-AM-PLN-001.pdf
11	NPK Business Services Reports monthly 2014 - 2017.docx
12	1707B3 Steam Turbine Generator Inspection Timing.pdf
13	170421 NPK MAT MAI RASCI Matrix 2017 April 21.xlsx"
17	17 Management of Change NPK-COR-ENG-PRO-003.pdf
27	Outline Project Evaluation Form NPK-FA-FRM-001.pdf
30	NPK FRM ENG 009 Project Evaluation Rev5 ESP Oil Varnish removal unit.xlsx
31	Project Investment Appraisal Procedure NPK-FA-PRO-001.pdf
32	SD-5_14KP08_14SSC05_Operator Services Agreement NGPK SSCP dated 30-09-14....pdf
40	08. NPK Trading Assumptions Workbook Budget Jul-17 to Jun-18 FINAL.PDF
41	09. Trading Variances Presentation.pdf
43	43 28092016 NPK Operating Plan (FINAL).pdf

Criteria Effectiveness			Post Review Audit Priority						
	Evidence Ref#	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
11.1 There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 27, 32, 43	Planned works mentioned in monthly reports. Service C Responsibilities shown in RASCI chart.	C	1	LOW	S	5	B	1
11.2 The plan provide reasons for capital expenditure and timing of expenditure	2, 4, 5, 7, 8, 9, 10, 11, 12, 17, 30, 31, 32, 40, 41, 43	Capital expenditure justified and co-ordinated with planned outages	C	1	LOW	S	5	B	1
11.3 The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	2, 4, 5, 7, 8, 9, 10, 11, 12, 17, 30, 31, 32	Life cycle costing includes major capital expenditure identified in the AMP. It has been revised to reflect the avoidance of a major GT service as a result of the MXL upgrade.	C	1	LOW	S	5	B	1
11.4 There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned	2, 4, 5, 7, 8, 9, 10, 11, 17, 30, 31, 32	Monthly reports report capital projects.	C	1	LOW	S	5	B	1
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still “under review” in the review period and issued in September 2017.									

12.	**Key Process - Review of AMS** *The asset management system is regularly reviewed and updated* **Outcome** *Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency.*	**Asset management process and policy definition adequacy rating** **B**	**Asset management performance rating** **1**

Interviewees:

Mark Hammond	Power Station Manager	NewGen Power Pty Ltd
Ralph Lochbuehler	Operations Manager	NewGen Power Pty Ltd
Kris Roots	Power Station Manager	NewGen Power Pty Ltd
Tim Harrison	Maintenance Manager	NewGen Power Pty Ltd

Relevant documentation:

2	Asset Management System Manual NPK-COR-AM-MAN-001.pdf
3	OLD AMS Newgen Kwinana August 2008 ver(4).pdf
4	Strategic Asset Management Plan NPK-COR-AM-PLN-002.pdf
8	NewGen Power Kwinana - Budget Presentation FY18.pptx
9	NPK FY18 Detailed Budget Pack FINAL.pdf
11	NPK Business Services Reports monthly 2014 - 2017.docx
32	SD-5_14KP08_14SSC05_Operator Services Agreement NGPK SSCP dated 30-09-14....pdf

Criteria Effectiveness			Post Review Audit Priority						
	Evidence Ref#	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
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	2, 3, 4, 8, 9, 11, 32	AMP to be reviewed each year. The old AMP does not appear to have been revised since first issue in 2008 but monthly reports indicate that elements such as service outages, maintenance schedules, cost forecasting, asset creation etc have been maintained during the reporting period.	B	2	MEDIUM	S	4	B	2
12.2 Independent reviews (eg internal audit) are performed of the asset management system	2, 11, 32	ERA requires AMS review as part of the licensing renewal. Insurance/ safety/ pressure vessel etc audits/reviews are regularly conducted. Internal and external AMS reviews are planned.	B	2	MEDIUM	S	4	B	1
Comments & Recommendations									
Adequacy rating B as the revised AMP documentation was still “under review” in the review period and issued in September 2017. Ensure that annual review of the AMP is implemented.									

APPENDIX 2

Review Plan Asset Review Priorities

Table 10 Effectiveness Criteria Pre-audit Review.

Ref	Asset management system component	Details/ Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium high	Adequacy of existing controls S=strong, M=moderate, W=weak			Review Priority			
							1	2	3	4	5	N/A
1	**Asset Planning**	Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).					0	0	0	7	2	0
1.1		Asset management plan covers key requirements	2	C	MEDIUM	M				4		
1.2		Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	2	C	MEDIUM	M				4		
1.3		Service levels are defined	2	C	MEDIUM	M				4		
1.4		Non-asset options (eg demand management) are considered	1	B	LOW	M					5	
1.5		Lifecycle costs of owning and operating assets are assessed	2	C	MEDIUM	M				4		
1.6		Funding options are evaluated	2	C	MEDIUM	M				4		
1.7		Costs are justified and cost drivers identified	2	C	MEDIUM	M				4		
1.8		Likelihood and consequences of asset failure are predicted	2	C	MEDIUM	M				4		
1.9		Plans are regularly reviewed and updated	1	B	LOW	M					5	
2	**Asset creation/acquisition**	Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.					0	0	0	4	1	0
2.1		Full project evaluations are undertaken for new assets, including comparative	2	C	MEDIUM	M				4		

Ref	Asset management system component	Details/ Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium high	Adequacy of existing controls S=strong, M=moderate, W=weak			Review Priority			
							1	2	3	4	5	N/A
		assessment of non-asset solutions										
2.2		Evaluations include all life-cycle costs	1	C	LOW	M					5	
2.3		Projects reflect sound engineering and business decisions	2	C	MEDIUM	M				4		
2.4		Commissioning tests are documented and completed	2	C	MEDIUM	M				4		
2.5		Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood	2	C	MEDIUM	M				4		
3	**Asset disposal**	Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms					0	0	0	3	1	0
3.1		Under-utilised and under-performing assets are identified as part of a regular systematic review process	2	C	MEDIUM	M				4		
3.2		The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	2	C	MEDIUM	M				4		
3.3		Disposal alternatives are evaluated	1	C	LOW	M					5	
3.4		There is a replacement strategy for assets	2	C	MEDIUM	M				4		

Ref	Asset management system component	Details/ Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium high	Adequacy of existing controls S=strong, M=moderate, W=weak			Review Priority			
							1	2	3	4	5	N/A
4	**Environmental analysis**	Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.					0	0	0	3	1	0
4.1		Opportunities and threats in the system environment are assessed	1	C	LOW	M					5	
4.2		Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved	2	C	MEDIUM	M				4		
4.3		Compliance with statutory and regulatory requirements	2	C	MEDIUM	M				4		
4.4		Achievement of customer service levels	2	C	MEDIUM	M				4		
5	**Asset operations**	Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.					0	0	0	3	2	0
5.1		Operational policies and procedures are documented and linked to service levels required	1	C	LOW	M					5	
5.2		Risk management is applied to prioritise operations tasks	1	C	LOW	M					5	
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	2	C	MEDIUM	M				4		
5.4		Operational costs are measured and monitored	2	C	MEDIUM	M				4		
5.5		Staff resources are adequate and staff receive training	2	C	MEDIUM	M				4		

Ref	Asset management system component	Details/ Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium high	Adequacy of existing controls S=strong, M=moderate, W=weak			Review Priority			
							1	2	3	4	5	N/A
		commensurate with their responsibilities										
6	**Asset maintenance**	Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.					0	0	0	6	0	0
6.1		Maintenance policies and procedures are documented and linked to service levels required	2	B	MEDIUM	M				4		
6.2		Regular inspections are undertaken of asset performance and condition	2	B	MEDIUM	M				4		
6.3		Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	2	C	MEDIUM	M				4		
6.4		Failures are analysed and operational/maintenance plans adjusted where necessary	2	C	MEDIUM	M				4		
6.5		Risk management is applied to prioritise maintenance tasks	2	C	MEDIUM	M				4		
6.6		Maintenance costs are measured and monitored	2	C	MEDIUM	M				4		
7	**Asset Management Information System**	An asset management information system is a combination of processes, data and software that support the asset management functions.					0	0	0	5	2	0
7.1		Adequate system documentation for users and IT operators	2	B	MEDIUM	M				4		
7.2		Input controls include appropriate verification and validation of data entered into the system	1	B	LOW	M					5	
7.3		Logical security access controls appear adequate, such as passwords	2	C	MEDIUM	M				4		

Ref	Asset management system component	Details/ Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium high	Adequacy of existing controls S=strong, M=moderate, W=weak			Review Priority			
							1	2	3	4	5	N/A
7.4		Physical security access controls appear adequate	2	B	MEDIUM	M				4		
7.5		Data backup procedures appear adequate and backups are tested	2	C	MEDIUM	M				4		
7.6		Key computations related to licensee performance reporting are materially accurate	2	B	MEDIUM	M				4		
7.7		Management reports appear adequate for the licensee to monitor licence obligations	1	C	LOW	M					5	
8	**Risk Management**	Risk management involves the identification of risks and their management within an acceptable level of risk.					0	0	0	3	0	0
8.1		Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system	2	B	MEDIUM	M				4		
8.2		Risks are documented in a risk register and treatment plans are actioned and monitored	2	B	MEDIUM	M				4		
8.3		The probability and consequences of asset failure are regularly assessed	2	B	MEDIUM	M				4		
9	**Contingency Planning**	Contingency plans document the steps to deal with the unexpected failure of an asset.					0	0	0	1	0	0
9.1		Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	2	B	MEDIUM	M				4		

Ref	Asset management system component	Details/ Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium high	Adequacy of existing controls S=strong, M=moderate, W=weak			Review Priority			
							1	2	3	4	5	N/A
10	**Financial Planning**	The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term.					0	0	0	0	6	0
10.1		The financial plan states the financial objectives and strategies and actions to achieve the objectives	1	C	LOW	M					5	
10.2		The financial plan identifies the source of funds for capital expenditure and recurrent costs	1	C	LOW	M					5	
10.3		The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	1	C	LOW	M					5	
10.4		The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period	1	C	LOW	M					5	
10.5		The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	1	B	LOW	M					5	
10.6		Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary	1	C	LOW	M					5	

Ref	Asset management system component	Details/ Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium high	Adequacy of existing controls S=strong, M=moderate, W=weak			Review Priority			
							1	2	3	4	5	N/A
11	**Capital Expenditure Planning**	The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years. Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates					0	0	0	0	4	0
11.1		There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates	1	C	LOW	M					5	
11.2		The plan provide reasons for capital expenditure and timing of expenditure	1	C	LOW	M					5	
11.3		The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	1	C	LOW	M					5	
11.4		There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned	1	C	LOW	M					5	
12	**Review of AMS**	The asset management system is regularly reviewed and updated.					0	0	0	2	0	0
12.1		A review process is in place to ensure that the asset management plan and the asset	2	B	MEDIUM	M				4		

Ref	Asset management system component	Details/ Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium high	Adequacy of existing controls S=strong, M=moderate, W=weak			Review Priority			
							1	2	3	4	5	N/A
		management system described therein are kept current										
12.2		Independent reviews (eg internal audit) are performed of the asset management system	2	B	MEDIUM	M				4		
	TOTAL OF EACH PRIORITY						0	0	0	39	18	0