McGill Engineering Services Pty Ltd

Engineering, Adjudication & Arbitration Services ABN 45 106 691 169

BHP BILLITON NICKELWEST PTY LTD DISTRIBUTION LICENCE EDL 2 ASSET MANAGEMENT SYSTEM REVIEW

Prepared By Kevan McGill
10 September 2010

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Bill Head
Energy Management Group
Stainless Steel and Materials – Nickel West
BHP Billiton Pty Ltd Nickel West
152-158 St George Tce
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Dear Mr Head

Asset Management System Review Electricity Licences

The fieldwork on the asset management system review of Distribution Licence EDL 2 for the review period (31 March 2008 to 30 March 2010) is complete and I am pleased to submit the report to you.

In my opinion, the Licensee maintained, in all material aspects, effective control procedures and an effective asset management system in relation to the Distribution licence (EDL 2) for the audit period on the relevant clauses referred to within the scope section of this report.

Yours sincerely

Kevan McGill
Director

Date 10 September 2010

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Executive Summary

BHP Billiton Nickel West (*NiW*) holds an Electricity Distribution Licence (EDL2) issued by the Economic Regulation Authority under the Electricity Industry Act 2004 (WA). The Electricity Industry Act 2004 (WA) requires the holder of a Distribution Licence to undertake a Review, and provide the Authority a report, by an independent expert on the effectiveness of their Asset Management System. This Review of the Nickel West Asset Management System was conducted in accordance with the guidelines issued by the Economic Regulation Authority (*Authority)* for the review period (31 March 2008 to 30 March 2010) to assess the Licensee's asset management systems.

Following development of an Asset Management System Review Plan and its approval by the Authority, Nickel West appointed McGill Engineering Services to undertake the Review.

Nickel West operates a small distribution network in the mining town of Leinster (the northern system) and a small non continuous network to 5 mining customers in the Kambalda region (the southern system). In the southern system the distribution system consists of off-takes from another licensee's distribution or transmission system and connections to customers. The northern system is the Leinster town site with less than 300 connections to consumers but who are not considered as customers as electricity is not retailed to the consumer. These distribution networks are not Nickel West's core business (or reason to be in business) but legacy networks of Nickel West mining infrastructure following sale of mining tenements and supply to consumers in the town of Leinster, Leinster is a mine controlled town with accommodation only provided for people associated with the mines, or the local town / community support functions.

The records and areas covered by the License were inspected and interviews were also held with key personnel at the operational sites (Leinster and Kambalda) and in the Perth Office. The extent of the Licensee's assets has not changed since the last audit. While the Licence covers Mt Keith there are currently no distribution assets at Mt Keith.

The Electricity Licence requires Nickel West to provide the authority with a report following the Asset Management System Review by an independent expert on a defined time scale. This is the second review of the Nickel West Asset Management System. Following the first review, Nickel West was issued with a Section 32 Notice. The primary issue with regard to Asset Management Systems was for Nickel West to develop an Asset Management Plan that adequately addressed 11 key points. The AMP has been prepared and all items have been addressed.

OVERALL CONCLUSION

In my opinion, the Licensee maintained, in all material aspects, an effective asset management system in relation to the Distribution licence (EDL 2) for the review period based on the relevant clauses referred to within the asset management review objectives (Page 12) of this report.

It is apparent that Nickel West has made a positive step change in formalising the management and documentation of its assets and systems to align with licence requirements. This has included

- Preparation of an Asset Management Plan
- Carrying out a risk assessment of its assets and supply obligations
- Undertaking power quality assessments
- Undertaking meter testing

There are no significant issues and a few minor recommendations arising from the current audit.

LICENCE

The distribution licence covers the Mt Keith area but currently there are no distribution assets in the area (other than exempted self supply). The Licensee can leave the licence as it is to allow for future expansion and explain in any review that there is nothing to review in that area or if it considers that there is no need for an expansion provision could advise the Authority (and pay the fee to amend the licence) to remove Mt Keith from the licence.

The Leinster site is covered by a Development Act. In the like area of Mt Newman an exemption from licensing has been obtained. The Licensee may wish to consider and explore a similar exemption.

AMS REVIEW – METHODOLOGY AND SUMMARY

The overall effectiveness rating for an asset management process is based on a combination of the process and policy adequacy rating and the performance rating. The rating systems are given below followed by a summary table of the Asset Management Effectiveness

RATING SYSTEM

The definition tables for process and policy adequacy rating and the performance rating are provided below.

Asset management process and policy definition adequacy ratings

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

C	Requires significant improvement	• Process and policy documentation is incomplete or requires significant improvement. • Processes and policies do not document the required performance of the assets. • Processes and policies are significantly out of date. • The asset management information system(s) require significant improvements (taking into consideration the assets that are being managed).
D	Inadequate	• Processes and policies are not documented. • The asset management information system(s) is not fit for purpose (taking into consideration the assets that are being managed).

Asset management review effectiveness rating scale

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

ASSET MANAGEMENT EFFECTIVENESS SUMMARY

A summary of 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 below.

Asset management effectiveness summary

ASSET MANAGEMENT SYSTEM	Asset management process and policy definition adequacy rating	Asset management performance rating
1. Asset planning	A	NR[1]
2. Asset creation/ acquisition	A	NR
3. Asset disposal	A	NR

[1] NR – Not Rated

4. Environmental analysis	A	2
5. Asset operations	B	2
6. Asset maintenance	A	2
7. Asset Management Information System	A	1
8. Risk management	B	2
9. Contingency planning	B	2
10. Financial planning	A	1
11. Capital expenditure planning	A	1
12. Review of AMS	A	NR

A Not Rated (NR) score is given when there was insufficient evidence relevant within the audit period to make a determination.

It is not implied that any assessment at “A” or “1” means that there is not scope for continuous improvement, rather that no recommendations for improvement have been recommended in this report.

RECOMMENDATIONS

No.	Process
4	*Objective 4. Environmental analysis* Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.
	Recommendation A process to scan the external environment should be added to the asset management plan.
5	*Objective 5. Asset operations* Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.
	Recommendation Continue to develop and improve the register and plans and familiarisation of additional personnel.
6	*Objective 6. Asset maintenance* Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.
	Recommendation Opportunity for improvement: For the northern system, certainty and consistency of maintenance could be improved by using the power of the SAP system by adding standard work specifications and more scheduled preventative maintenance tasks.
8	*Objective 8. Risk Management* Risk management involves the identification of risks and their management within an acceptable level of risk
	Recommendation Consideration for including regular review of identified risks and progress to

	resolving these in a compliance manual. Consideration should also be given to include the regular assessment of probability and consequence of asset failure.
9	*Objective 9. Contingency Planning* Contingency plans document the steps to deal with the unexpected failure of an asset.
	Recommendation Determine generation requirements, injection points and mobilisation plans for key points of supply.
12	*Objective 12. Review of AMS* The asset management system is regularly reviewed and updated.
	Recommendation The Asset Management System requires formal review every year. It is recommended that an internal review of the AMS by the asset manager should be scheduled to identify gaps and improvements. It recommended that this is carried out every 3 months and is included in a compliance manual.

POST REVIEW IMPLEMENTATION PLAN

The Licensee will provide a post review implementation plan.

SECTION 32 NOTICE – SUMMARY STATUS

The Authority issued a Section 32 Notice after the last audit. A summary of actions and status relevant to the Asset Management System is given below with the detail provided in the main body of the report

Section 32 Notice Reference	**Status**
2.1	Complete
2.2.1	Complete
2.2.2	Complete
2.2.3	Complete
2.2.4	Complete
2.2.5	Complete
2.2.6	Complete – (after audit period)
2.2.7	Complete
2.2.8	Complete
2.2.9	Complete
2.2.10	Complete
2.2.11	Complete

Section 32 Notice – Detailed Status

Following the previous AMS review carried out in 2008/9, the Authority issued a Section 32 Notice on BHPBilliton Nickel West. Nickel West engaged a consultant to review the electrical licences, the customer base, the site assets, infrastructure and processes and then conduct a risk assessment workshop. Following this, the consultant undertook the preparation and development of an Asset Management Plan. The part of the Notice relevant to the Asset Management System and subsequent action status are below.

Schedule of Contraventions

2. ***Contravention of clause 19 of Distribution Licence***

Clause 19.1 of the Distribution Licence states:

"The licensee must provide for, and notify the Authority of, an asset management system in relation to the distribution system within 2 business days from the commencement date or from the completion of construction of the distribution system, whichever is later."

The asset management system is defined in the Distribution Licence as "the measures that are to be taken by the licensee for the proper maintenance, expansion or reduction of the distribution system".

The audit report discloses that no formal asset management system exists and no details of the asset management system have been provided to the Authority (page 15). Further, although NiW appears to have an informal asset management system, the audit report discloses a number of deficiencies with NiW's asset management system for its distribution system. Some of the deficiencies disclosed in the audit report are such that the Authority does not consider that NiW's asset management system puts in place measures for the proper maintenance of the distribution system.

In particular, to comply with clause 19.1 of the Distribution Licence, the following measures are required to be implemented:

2.1 NiW must formalise and implement an Asset Management Plan ("AMP") and must formally approve the AMP.

Status: Complete. An asset management plan has been developed and implemented. The copy of the Asset Management Plan has been provided to the Authority. Whilst the plan did have internal review it was not formally approved during the audit period. Approval of the asset management plan by the Licensee (and development of a compliance handbook) took place after the audit period.

2.2 The following issues must be adequately addressed in the AMP:

2.2.1 a list of available and required critical spares to avoid disposing of critical or retaining unnecessary plant;

Status: Complete. List of required critical spares is included in AMP. The AMP identifies some major capital spares to be considered and which will

require further analysis and justification. Spares are retained at each of the sites.

2.2.2 high level disposal plans for electrical plant should be included in the AMP;

Status: Complete. Disposal actions plans are included in AMP. There are disposal and restoration action set out in mine lease decommissioning and closure plans. The mine closure plans undergo review every few years. Disposal of assets is managed by central stores and procedures are in place to comply with environmental and accounting standards.

2.2.3 operational plans must be linked to service levels and reviewed regularly;

Status: Complete. Service levels are defined in Power Purchase Agreements with customers and the AMP refers to the same principles for operations and outage planning. The distribution system, being very limited in size, is substantially static and does not require the same active daily operational control as generation plant or a large network would. Operational issues generally arise for specific maintenance. As a result it is not necessary for regular review of operational plans as they are reviewed as part of outage planning. Personnel and resource requirements are reviewed annually as part of the annual budgeting process. The NiW maintenance manual sets out maintenance indicators. Formal review has not been undertaken within the audit period as the AMP was less than a year old.

2.2.4 asset registers must be formalised and a complete set of plans created;

Status: Complete. The key assets are recorded in the SAP maintenance system which is used to schedule maintenance. Maintenance work orders were viewed live on the computer with the maintenance planner. The works orders are supported by more detailed comprehensive listing in spreadsheets where required. The spreadsheets were seen and provide detail to component level.

2.2.5 maintenance plans must be fully documented for plant and regularly reviewed;

Status: Complete. NiW uses preventative and condition based maintenance. Some of the maintenance plans and inspection activities to assess the condition of the assets were viewed on the computer. The planner and supervisor described the return of completed works orders, capture of history, raising of further maintenance work orders or revisions to inspections. The network was seen to be in good condition indicating that effective maintenance is being carried out.

2.2.6 the development of an IT system that would provide a roadmap to all relevant data and capture compliance issues including a mechanism to ensure regular reviews of the system;

Status: Complete (after audit period). The SAP system is a powerful and widely used application for maintenance of very sophisticated plant and has been implemented. SAP is used in the southern system where it is integrated with the mine operations effectively. The system is in place in the northern system but could be used more comprehensively to improve

controls. Work Orders are included in SAP but the content of some of these and regular scheduling of items could be improved. While SAP deals with all relevant data and scheduled operational and maintenance issues, a compliance manual has been developed outside of the audit period to deal with compliance issues.

2.2.7 a risk register and the process to review it regularly;

Status: Complete. A risk register is included as part of the AMP. The review process is part of asset manager's responsibilities on an annual basis, but formal review has not been undertaken within the audit period as the risk register in the AMP was less than a year old.

2.2.8 the use of risk analysis and its link to service levels;

Status: Complete. The risk management process seen in the AMP assesses risk against service level criteria. Primarily this is on reliability or continuity of supply risk but also consider customer service and financial aspects. There is also a power quality monitoring plan included in the AMP to address that element of service level.

2.2.9 contingency planning and documentation of that planning;

Status: Complete. The AMP contains a developed contingency plan. The majority of the Nickel West network is radial with little inbuilt redundancy and no remote switching capability. Response of personnel is a key issue and this is suitably documented. The AMP has identified and documented requirements for general contingency spares and additional major spares for further consideration.

2.2.10 financial planning and documentation of that planning; and

Status: Complete. The AMP covers financial planning. The capital budget plans for only minor items of plant (generally $5000 per year with one year of $50,000) which reflects the static nature of the system and that capital expansion will be driven by mining decisions rather than any independent development options. The Electrical maintenance and operations budget are a small part of the total operational budget so do not warrant separate line items.

2.2.11 a mechanism to ensure there are regular reviews of the AMS.

Status: Complete. The AMP indicates that it will be reviewed annually. The review process is part of asset manager's responsibilities on an annual basis, but formal review has not been undertaken within the audit period as the AMP was less than a year old.

Asset Management System Review

ASSET MANAGEMENT SYSTEM REVIEW OBJECTIVES

Under the *Electricity Industry Act 2004* (the Act) section 14, the holder of a Distribution License must develop an Asset Management Plan and maintain an asset management system to manage the assets accordingly for delivery of a reliable service to its customers. The Act requires a review of the asset management system every two years (or other time approved by the *Authority).*

This report is an impartial review of the Licensee's asset management effectiveness under the Audit Guidelines: Electricity, Gas and Water Licences published by the ERA.

The review conducted between May and June 2010 examined the asset management processes used by the Licensee in delivering the services to its customers. These services include lifecycle processes for:

- Asset planning;
- Asset creation/acquisition;
- Asset disposal;
- Environmental analysis;
- Asset operations;
- Asset maintenance;
- Asset management information system (AMIS);
- Risk management;
- Contingency planning;
- Financial planning;
- Capital expenditure planning; and
- Review of the asset management system.

As well as the processes, the asset management supporting systems were tested as to their use and effectiveness. Data used by the Licensee was also examined with respect to its effectiveness for asset management and the delivery of outcomes.

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

Tests were undertaken through interviews and investigation of the processes to assess whether they were being performed as documented.

The Licensee appointed McGill Engineering Services Pty Ltd to conduct the review of its Distribution Licence with approval from the Authority. A preliminary assessment was conducted with the Licensee's management to determine the inherent risk and the state of control for each compliance element of the Licence obligation. McGill Engineering Services Pty Ltd then prioritised the audit coverage based on the risk profile of the

Licensee with an emphasis on providing greater focus and depth of testing for areas of higher risk to provide reasonable assurance that the Licensee had complied with the standards, outputs and outcomes under the Licence obligations.

The audit was conducted in a manner consistent with Australian Auditing Standards (AUS) 808 “Planning Performance Audits” and AUS 806 “Performance Auditing”. McGill Engineering Services Pty Ltd evaluated the adequacy and effectiveness of the controls and performance by the Licensee relative to the standards referred in the Distribution Licence through a combination of enquiries, examination of documents and detailed testing for Electricity Distribution Licence EDL 2 for BHPBilliton NickelWest Pty Ltd.

STATEMENT OF INDEPENDENCE

To the best of my knowledge and belief, there is no basis for contraventions of any professional code of conduct in respect of the audit.

I have not done or contemplate undertaking any other work with the Licensee.

There are no independence threats due to:

- self-interest – as the audit company or a member of the audit team have no financial or non-financial interests in the Licensee or a related entity;
- self-review – no circumstance has occurred where:
    - the audit company or a member of the audit team has undertaken other non-audit work for the Licensee that is being evaluated in relation to the audit/review; or
    - when a member of the audit team was previously an officer or director of the Licensee; or
    - where a member of the audit team was previously an employee of the Licensee who was in a position to exert direct influence over material that will be subject to audit during an audit/review.

There is no risk of a self-review threat as:

- no work has been
    - undertaken by the auditor, or a member of the audit/review team, for the Licensee within the previous 24 months; or
    - the auditor is currently undertaking for the Licensee; or
    - the auditor has submitted an offer, or intends to submit an offer, to undertake for the Licensee within the next 6 months; and
- familiarity – there is no close family relationship with a Licensee, its directors, officers or employees,
- and is not nor is perceived to be too sympathetic to the Licensee’s interests.

REVIEW (AUDIT) PERIOD

The review (audit) period is 31 March 2008 to 30 March 2010.

SCOPE LIMITATION

The review was undertaken by examination of documents, interviews with key persons and observations and is not a detailed inspection of physical items.

PREVIOUS ACTIONS

The actions to follow up previous reviews are detailed below.

No.	Asset Management Element	Finding	Rating	Corrective Actions	Actions Taken Future action
1	Asset Planning	No service levels are defined.	3	Formalise an AMP and define service levels. Strategy to be formalised in the next 6 months and implemented over the next 12 months in line with budgetary guidelines. Responsible: BH	Complete. The AMP has been developed, implemented and service levels defined. The AMP includes a risk management plan and contingency plan. No further action required.
3.3	Disposal alternatives are identified.	Decommissioning is done as part of the mining projects. Decommissioned assets are all returned to a central stores dept for refurbishment, reuse or disposal. No spares list was available.	1	Develop, maintain and distribute a list of available and required critical spares to avoid disposing of critical or retaining unnecessary plant. High level disposal plans for electrical plant should be included in the AMP. To be implemented in the next 6 months. Responsible: BH	Complete. The AMP implemented and critical spares defined. Due to the fairly small network operated by Nickel West the number of critical spares is small. Disposal of assets included in AMP. There are also comprehensive mine closure and decommissioning plans for the assets at each of the Mines. No further action required.
5.1	Operational policies and procedures are documented and linked to service levels required.	Operational plans are produced by SAP. These plans reflect an economic decision on spending rather than being linked to service levels.	2	Link operational plans to service levels and review regularly. To be implemented in the next 6 months. Responsible: BH	Complete. The AMP implemented and service levels defined. The distribution system is static and does not require operation outside maintenance / fault

					switching. Operational policies are substantially maintenance / reliability matters. No further action required.
5.3	Assets are documented in an Asset Register including asset type, location, material, plans of components, and an assessment of assets' physical/structural condition and accounting data.	No formal process for maintaining asset registers outside of SAP. Both sites use different systems for storing the data. CT / VT data was requested, but not received	0	Formalise asset registers and create a complete set of plans. To be implemented in the next 6 months. Responsible: BH	Complete. Asset registers are being kept in SAP and supported by spreadsheets for both sites. This is acceptable electrical industry practice. CT/VT information made available. Plans available but meter plans could be improved with technical content or further cross referencing to other drawings. Non mandatory further action (Audit guidelines 11.9) is to improve technical content or cross reference to other meter drawings.
6.4	Failures are analysed and operational / maintenance plans adjusted where necessary.	Maintenance plans are high level plans that can lead to items being missed by inexperienced staff.	3	Maintenance plans for plant to be improved and reviewed regularly. To be implemented in the next 6 months. Responsible: BH	Complete. Maintenance plans incorporated in AMP. Review is assigned to asset manager. Review of maintenance plans is undertaken at the sites based on equipment status and incidents. No further action required
7	An asset management information system is a combination of processes, data and software that support the asset management functions.	SAP is used as the primary MIS backed up by excel files at Leinster. Staff is being trained in the SAP and some links between operations and maintenance works were missing. However, the missing linkages were able to be found during searches. There is no overarching MIS that integrates all components. CITECT is used to	1	An IT system should be developed that will provide a roadmap to all relevant data and capture compliance issues. The effectiveness of the MIS should be reviewed regularly. To be implemented in the next 6 months. Responsible: BH	Complete A satisfactory maintenance system is in place using the SAP system. Asset registers have been set up. Effectiveness has not been reviewed as it was not due in the audit period following implementation of the systems. A map of the telemetry meter management and communication system has been prepared. The operational work is minimal as the network is

		store metering data and display system status.			largely static apart from when maintenance is being undertaken. While SAP deals with all relevant data and scheduled operational and maintenance issues (i.e. provides a road map) a compliance manual is being developed to deal with compliance issues Action Non mandatory further action (Audit guidelines 11.9) is to capture the regular review process to a compliance manual. Note this action has been completed (outside the audit period).
8.2	Risks are documented in a risk register and treatment plans are actioned and monitored.	Risks are identified on a local, informal basis and if one is considered to be significant, a SAP works order is initiated. The risks are not documented.	1	Create a risk register and review regularly. To be implemented in the next 6 months. Responsible: BH	Complete. Risk register included in AMP. A review of the AMP was not due within the audit period. No further action required.
8.3	The probability and consequences of asset failure are regularly assessed.	No risk analysis is used.	0	Risk analysis to be used and linked to service levels. To be implemented in the next 6 months. Responsible: BH	Complete. Risk management process set out in AMP and is aligned to the service levels agreed in the PPAs. No further action required.
9	Contingency plans document the steps to deal with the unexpected failure of an asset.	The network operates predominantly as a radial network. Some spares are kept by stores, but the list of spares is not distributed. No formal contingency plans exist.	0	Contingency planning should be developed from the Risk Register and documented during reviews. To be implemented in the next 6 months. Responsible: BH	Complete. Contingency planning process set out in AMP. This includes identification of spares and resources No further action required.
10	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	The network aims to operate as a non-profit centre. No formal financial plan exists. Operations and maintenance costs are planned and tracked through SAP.	2	Financial planning should form a part of the AMS. The current system is functional and sufficient for NiW's needs, but should be documented. To be implemented in the next 6 months. Responsible: BH	Complete. Financial planning process set out in AMP. The assets are managed as part of the overall mine planning and costing regimes. Simple budgets are prepared annually for 5 years with a focus on the first 2 years. Growth will not be gradual long term development normal for distribution

	term.				networks, but will be determined by the viability of mining projects.
					No further action required.

The key contacts were:

- Licensee
  - Bill Head — Asset Manager
  - Lionel Diprose — Kambalda Electrical Supervisor
  - Charlie Higgins — Consultant Contractor
  - Jack Howden — Maintenance Planner
  - Dave Harrison — Electrical Inspector
- McGill Engineering Services Pty Ltd
  - Kevan McGill

The review was conducted during May and June 2010. Kevan McGill took approximately 100 hours on the review.

\Stage	**Auditor**	**Standard**
1. Risk & Materiality Assessment Outcome - Operational/ Performance Audit Plan	K McGill	ASA 300 Planning ASA 315: Risk Assessments and Internal Controls AUS 808: Planning Performance Audits AS/NZS 4360:2004: Risk Management ERA Guidelines
2. System Analysis	K McGill	AUS 810: Special Purpose Reports on Effectiveness of Control Procedures
3. Fieldwork Assessment and testing of; • The control environment • Information system • Compliance procedures • Compliance attitude	K McGill	AUS 502: Audit Evidence AUS 806: Performance Auditing
4. Reporting	K McGill	ASA 300 Planning AUS 806: Performance Auditing

DISTRIBUTION SYSTEM

The history of the system is that WMC Resources Limited (WMC), now trading as Nickel West following acquisition by BHP Billiton and registration of Change of Name, originally built, owned and maintained the generation and distribution systems as facilities required to operate its assets in Western Australia. This distribution network supplied mines owned by Nickel West and the town of Leinster.

Nickel West has subsequently sold all the generation assets and the majority of the distribution assets to TransAlta Energy Australia trading as Southern Cross Energy (SCE). Nickel West also sold some of the remote mines, complete with sections of the distribution network to third party miners. The remaining sum total length of Nickel West's distribution lines is limited to 72 kilometres.

The Nickel West distribution system is divided into what is referred to as the Northern System in the Leinster region and the Southern System in the Kambalda region. As part of the sale of the remote mines, Nickel west entered into Power Purchase Agreements to allow the mines to be viable and utilise existing gas supply, gas transport and power generation agreements to the benefit of all the parties. In some cases Nickel West entered into ore off take or tolling agreements. The above supply arrangements, whilst not core business for Nickel West, have required Nickel West to register as a distributor and retailer under the subsequent Electricity Industry Act 2004.

Distribution

The Nickel West distribution systems essentially operate as radial systems.

The Northern Distribution System is an isolated system owned and operated for the most part by SCE. Nickel West has retained ownership and operates a small distribution network in the mining town of Leinster (the northern system) with less than 300 connections through the Leinster Supply Authority (LSA). Leinster is a closed town by invitation from Nickel West and provides residential accommodation and service facilities to their mine site at Leinster, Agnew Gold employees, support contractors and businesses.

The Southern Distribution System in the Kalgoorlie/Kambalda area is connected to the South West Interconnected System through a tie between SCE and Western Power at Boulder. The Nickel West portion of this distribution system is in the Kambalda region. It is essentially a non continuous radial system consisting of off-takes from another licensee's distribution system and connections to five mining customers. Some customers receive power at multiple metering points.

While the Licence covers Mt Keith there are no distribution assets (other than exempted self supply) and no retail.

At present, all Nickel West customers are mining operations with bilateral Power Purchase Agreements (PPA) and there are no Small Use Customers. For the purposes of this audit, a Customer has been defined by definitions used in the Metering Code 2005 and the Electricity Industry Act as being a person (or entity) to whom electricity is sold for the purpose of consumption. This definition is in line with the structure of the PPAs entered into by Nickel West. Several Customers have multiple metered entry connections covered by a single PPA.

Asset Maintenance Management

Maintenance management is a key function of the Nickel West asset management system. The software business application SAP is used to capture details of assets, set maintenance work schedules and record costs. Nickel West has transitioned through 3 platforms in recent years (WSAP under WMC, GSAP under BHPBilliton and more recently to 1SAP which will become a BHP Billiton single standard). The new 1SAP system uses SAP ERP6 as the platform. The maintenance module can interface to finance, supply and project systems modules which are used to varying degrees by maintenance personnel. For each asset created in SAP, maintenance schedules, bills of material and resources may be defined. Maintenance schedules are set for specific preventive maintenance tasks to be undertaken or inspections to assess condition. The result of inspections may lead to further work orders being raised to address issues identified. The maintenance inspections also include detailed procedures, technical drawings and supporting information (eg spreadsheets) as required. Historical information may be captured into SAP on completion of any work. Completion statistics may also be compiled and are monitored by supervisors. The above functions are used where deemed appropriate and useful to the task.

Annual budgets are prepared at each site with a five year planning horizon as part of the mine planning and budgeting program. The first two years are zero based budgets. Material, labour and contractor requirements are compiled from work schedules recorded in SAP.

REVIEW EVIDENCE

The following was considered in the review.

- Distribution Licence
- Section 32 Notice
- Past audit/review
- Reticulation plans
- Meter testing policy letters
- Outage log & loss of supply registration form
- Meter calibration report
- Asset management plan
- Risk management policy
- Decommissioning plans
- Preventative maintenance procedure
- Maintenance management manual
- Health, Safety and Environment management manual
- Project management manual
- BHPBilliton Code of Business Conduct
- Power quality analysis sample report

- Power procurement agreement (PPA) sample
- Meter drawings/documents
- Sample maintenance schedule
- High Voltage Isolation manual
- Fatal risk control standard

OVERALL CONCLUSION

In my opinion, the Licensee maintained, in all material aspects, effective control procedures and an effective asset management system in relation to the Distribution licence (EDL 2) for the review period based on the relevant clauses referred to within the asset management review objectives (Page 12) of this report.

FINDINGS

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

ASSET MANAGEMENT SYSTEM REVIEW RESULTS AND RECOMMENDATIONS

Asset Planning	**Process/Policy rating** A	**Effectiveness rating** Not Rated
1. *Asset planning* Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).		
Observations		
Asset Planning Process/Plan and its currency The Licensee has approximately 72 km of distribution lines at Leinster and Kambalda. The lines have not been surveyed for length and this is an estimated length from maps. Asset management has to be part of the context of the licensed operations as part of the business of the company which is mining. The licensed facilities only exist to facilitate mining and are governed by the life of the mine and the life cycle of distribution assets is usually much longer then the life of a mine. Asset planning will be subservient to mine planning. That is, there will be no planning for licensed assets that are not dependent on a mining development. The Licensee has developed an asset management plan for the licensed assets. This plan is to be reviewed annually. A person is designated as asset manager. The asset management plan consists of four parts: • Asset management plan • Risk management plan • Contingency plan • Power Quality Monitoring Plan Service strategies and service standards are set in the plan. Given the context of the licensed assets as part of much bigger assets, the plan is appropriate for the scale and nature of the operations. The plan is new so there is no established practice to assess compliance with the plan. *Allocation of responsibilities / statutory obligations* The organisational arrangements allocate responsibilities. There is documentation requiring compliance with statutory obligations. *Evaluation Criteria summary* • Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning. Response: The AMP meets this criterion and reflects the needs of all stakeholders and is integrated with business planning. The network is a small part of the electrical installation of the Licensee and is embedded in the larger process.		

- Service levels are defined

Response: The AMP defines service levels and is reflective of the service levels indicated in the Power Purchase Agreements.

- Non-asset options (eg demand management) are considered

Response: The AMS is substantially about utilization of the current assets and no new proposals are likely outside mining development. Further asset options are unlikely and non asset options such as better utilization of the current assets will be most likely for capacity increases. Load shed schemes operate for protection of the network with a view to minimise significant impact to customers. Demand management is a function for the customer most of whom are on two part tariffs – demand and energy.

- Lifecycle costs of owning and operating assets are assessed

Response: The AMP meets this criterion with lifecycle costs of owning and operating assets assessed as part of the existing mine infrastructure and any future mining proposals. Mine life, which is generally shorter than network asset life, is likely to be the determining factor of lifecycle costing. The capital cost will be considered and costed in mine project feasibility and not in terms of the electrical assets cost viability in its own right. Servicing the mines is the dominant requirement for the assets with mine profitability and metal prices being the major driving force. There has been no expansion within the audit period.

- Funding options are evaluated

Response: Financial decisions are often taken on mining project feasibility rather than analysis of the expected life of the electrical assets. Funding is determined by what is necessary to serve mining functions and funding provided for expansion from mining project feasibility.

- Costs are justified and cost drivers identified

Response: Financial decisions are often taken on metal process and mining project feasibility rather than analysis of the expected life of the electrical assets. Funding is determined by what is necessary to serve mining functions. Any proposal would include justification of costs and identification of cost drivers including availability and reliability of supply.

- Likelihood and consequences of asset failure are predicted

Response: The evaluation of risks addressed in the AMP cover the aspects of asset failure and consequences. The Asset Maintenance Plan is filed in the Electrical Licence records for the Energy Management Group and held on the computer server.

- Plans are regularly reviewed and updated

Response: The AMP meets this criterion as the responsibility of review of the AMS is assigned to the asset manager. A review of the AMP has not been undertaken as it was only recently implemented.

Asset management process and policy definition						
Process	☑	Policy	☑	Documentation	☑	
Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual.						
Asset management performance						
Process	☐	Availability	☐	Use	☐	
Issues						
The asset management has to be part of the context of the licensed operations as part of the business of the company, which is mining. The licensed facilities primarily exist to facilitate mining and are governed by the life of the mine. The life cycle of distribution assets is usually much longer than the life of a mine. Asset planning will be subservient to mine planning that is, there will be no planning for expansion of the licensed assets that are not dependent on a mining development. Given this context the plan is appropriate for the scale and nature of the business.						
Recommendation						
None -						

Asset Creation	Process/Policy rating A	Effectiveness rating Not Rated

2 Asset creation and acquisition

Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.

Observations

Policies and procedures for asset creation / sample creation activities
Procurement of major electricity plant is a very significant exercise taking considerable time. There are documented procedures for creation of fixed assets. Some minor work will be done to the assets and asset renewal (which are maintenance issues) but not creation of new major assets. There has been no significant asset creation on the distribution system in the audit period.

Meeting statutory obligations
There are documents and policies requiring employees and contractors to comply with statutory obligations.

The asset creation processes are appropriate with extensive project approval processes and standard engineering specifications prepared. The standard engineering specifications refer extensively to Australian Standards and Codes and Government Acts and Regulations.

Evaluation Criteria summary

- Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions.

Response: Asset creation is unlikely outside of mining development or expansion. In that circumstance there will be comprehensive assessment of creation options and justified as part of the mining project. Non asset creating solutions would need to be considered against existing capacity and the ability of mine expansion to operate within the capacity. Significant demand management is not likely to be acceptable or satisfy the customer where expansion is required. The most likely options are to utilize existing capacity of the current network or upgrading.

- Evaluations include all life-cycle costs

Response: Asset creation is unlikely outside of mining development or expansion where the capital cost is considered as part of the life cycle cost of the mine development. In that circumstance there will be comprehensive assessment of life cycle costs. The life of the asset is much more likely to be determined by the life of the mine rather than the life of the distribution asset.

- Projects reflect sound engineering and business decisions

Response: The Licensee has the resources in house and by contract to ensure sound engineering and business decisions. There will be no asset creation likely outside mining related development. Extensive use has been made of external consultants for detailed engineering design.

Nickel West has a comprehensive project approval process and the small project management framework document was sighted. This has not been

employed within the jurisdiction of the licence during the audit period as no expansion has taken place. It has however been used for electrical projects for self supply.

Nickel West has a comprehensive set of standard engineering specifications available for major components of the network, and samples were sighted.

- Commissioning tests are documented and completed

Response: The Licensee has the resources in house and by contract to ensure commissioning tests are documented and completed.

Nickel West has a comprehensive set of standard engineering specifications available for testing and commissioning of major components of the network. As no expansion has taken place in the audit period the use of these could not be tested for the licensed assets.

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

Response: The responsibilities of the AMS are assigned to the asset manager and understood. Legal, environmental and safety are key components of new project work within the organisation and are specifically required to be addressed in projects. Nickel West has a high focus on safety.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual. Sample tender documents were sighted and seen to be comprehensive.

Asset management performance

Process	☐	Availability	☐	Use	☐	

Issues

The procurement processes are appropriate.

Recommendation

None -

Asset Disposal	Process/Policy rating A	Effectiveness rating Not Rated

3. Asset disposal

Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms.

Observations

Policies and procedures for asset disposal / sample disposal activities
There was no disposal action in the audit period other than the replacement of a failed transformer which was deemed beyond economic repair (this is not disposal of a service but of a component). A replacement was obtained and the failed unit disposed of through the supplier. There are disposal processes in addition to those for justification of replacement of plant (which includes disposal of redundant plant). Asset disposal is managed by mine stores. Removing the licensed plant is unlikely during the life of the customers' mines. Disposal of assets in the Leinster town is addressed as part of mine closure plans. Disposal of an unutilised section of overhead line near Kambalda (as the load has been transferred to Western Power) is to be considered in the future.

The disposal processes are well defined.

Meeting statutory obligations
There are well documented obligations of the Licensee and their employees to comply with statutory obligation and a Code of Business Conduct.

Evaluation Criteria summary

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

Response: The AMS meets this criterion. There is little likelihood of disposal of the system or portions thereof outside mining operation imperatives. The only disposal undertaken during the audit period is of failed plant such as transformers. The existing assets are configured for customer load demands and even if under-utilized an economic case for re-sizing would not routinely be made as utilisation may increase as a result of mining activity. There has been no mine closure to justify recovery of assets in the audit period. Some mines were placed in care and maintenance regimes. A conscious decision was taken not to remove the electrical assets as mining operation may resume in the future.

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

Response: The most likely issue is plant failures and these are critically examined. The nature of the mining industry dictates that some plant will for periods be under utilised as a result of production demand. Under utilised plant during mining downturn is retained in-situ for future resumption of mining operations.

- Disposal alternatives are evaluated

Response: The AMS meets this criterion. There is little likelihood of disposal of the system or portions thereof outside mining operation imperatives. The only

disposal is of failed plant such as transformers and sale for scrap is the only real alternative.

- There is a replacement strategy for assets

Response: The AMS meets this criterion and allows for plant replacement. Replacement will be determined by expansion need or a finding from condition based maintenance.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual.

Asset management performance

Process	☐	Availability	☐	Use	☐	

Issues

None.

Recommendation

None

Environmental analysis	Process/Policy rating A	Effectiveness rating 2

4. Environmental analysis

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

Observations

Standards / monitoring / reporting / breaches

The Licensee has an Environmental Management Plan (EMP) developed to implement an environmental management system that complies with ISO 14001 standards and has been separately audited. Reporting and monitoring tools are appropriate.

The Licensee has a number of environmental licences and no unresolved issues have arisen with respect to environmental matters. No non compliances have been reported.

The principal external threats to the assets relate to storms or bush fires to distribution assets. Given the close relationship to the mines there are little threats of external competition to the assets. The capability to meet customer capacity requirements is part of the asset management plan.

Evaluation Criteria summary

- Opportunities and threats in the system environment are assessed

Response: Opportunities are unlikely outside mining initiatives. The Licensee is not actively seeking expansion opportunities for the network. Given the remote location threats are unlikely but the Licensee would be able to respond to any proposals.

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

Response: The AMS meets this criterion with service standards defined and statistics gathered. There has not been 4 years of statistics to provide the required 4 year reliability average. As supply is to the mining industry, capacity is only considered on a project by project basis. Forecasting for expansion is not relevant in the environment. Mining expansion is not predictable in the normal sense as it is heavily dependant on exploration and metal markets.

- Compliance with statutory and regulatory requirements

Response: The Licensee's policy documents require compliance with statutory and regulatory obligations. There have been no noted environmental breaches for the assets covered by the licence during the audit period.

Procedures at site require environmental approval for new projects, clearing of ground and other activities that impact the environment. Policy documents were sighted.

- Achievement of customer service levels

Response: The PPAs define the customer service levels. Review of the outage logs showed that the applicable service levels are maintained. Planned outages are communicated well in advance and correspondence was sighted.

Asset management process and policy definition						
Process	☑	Policy	☑	Documentation	☑	
Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual.						
Asset management performance						
Process	☑	Availability	☑	Use	☑	
Issues						
There are no environmental non-compliances reported. There are contingency plans that cover the threats and processes to minimise outages. The external issues other than capacity have a low visibility.						
Recommendation						
A process to scan the external environment should be added to the asset management plan.						

Asset operations	Process/Policy rating B	Effectiveness rating 2

5. Asset operations

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

Observations

Policies and procedures for asset operation / sample activities

The system is very small and operates without continuous surveillance by network staff. The southern system is part of a larger mine operations process. Network staff are contacted to treat alarms and carry out scheduled tasks, such as switching, on a planned or as required basis. Isolation and switching procedures requirements are documented (SP25). Switching and testing procedures are prepared in writing on prepared forms (copies sighted) as are inspection processes. The asset operation is appropriate for the duty.

The demands of the mining process dictate continuous supply with some contractual penalties for interruptions to supply and agreed understanding of expected service levels due to the nature of radial feed supply. These are defined in the Power Purchase Agreements which also cover access arrangements.

The Licensee records outages. The last review requested that operations plans are linked to service levels. The service levels are now defined and statistics are starting to be gathered but with a small number of customers statistical interpretation of results could be difficult. The feedback from statistics is more likely to affect maintenance regimes rather than operations but some improvements may be possible.

The asset register is part of the maintenance system and supported by spreadsheets. The last review requested that asset registers be formalised and create a complete set of plans. These are available.

Training/ resources / exceptions

The Licensee operates the plant. The resourcing is considered appropriate for the size of the network and ongoing training is evident, as are the operating procedures and practices. Plant operation and related maintenance appears to take due allowance of any possible faults or operating requirements in the licensed plant.

Evaluation Criteria summary

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

Response: The AMS meets this criterion with service standards defined. Due to the size and topology of the network there is no requirement for additional formal documentation.
The distribution system is static and does not require operation outside maintenance/fault switching. Switching process procedures are documented in SP25 (copy provided). Operational policies are substantially maintenance/reliability matters.

- Risk management is applied to prioritise operations tasks

Response: There is very little operational control as the assets are predominantly operated for maintenance requirements. As advised by the asset manager,

after safety, operational switching is, where possible, scheduled to restore larger load centres first, provided this can be done in an efficient manner. Simple risk analysis is applied by developing a task hazard analysis for all tasks on the site.

- Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural condition and accounting data

Response: Asset registers are contained with the appropriate information in the SAP system. These are supported by spreadsheets

- Operational costs are measured and monitored

Response: Operational costs – staffing, contracts and materials are measured and monitored. These are not significant to profitability or viability in the context of the core business being mining.

- Staff receive training commensurate with their responsibilities

Response: The staff receive training commensurate with their responsibilities. Personnel undergo HV Operator training for switching operations at established training centres followed by on site approval and appointment under Mining Regulations.

Nickel West follows a standard isolation permit procedure across all sites.

- Performance measures such as unplanned outages

Response: Outage log, including forced outages, has been implemented and was reviewed. It is notes that many outages are as a result of upstream supply issues beyond the control of the Licensee on the radial network with no alternate supply possible.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual.

Asset management performance

Process	☑	Availability	☑	Use	☑	

Issues

The asset operation is appropriate for the duty.

The reliance on spreadsheets is identified as a weakness, and these need to be better supported by capturing to the SAP maintenance system.

Personnel are adequate for normal duty. Consideration should be given to ensuring additional personnel are familiar with the network to cover emergency.

Considerable improvement in asset registers has been noted.

Recommendation
Continue to develop and improve the register and plans and familiarisation of additional personnel.

Asset Maintenance	Process/Policy rating A	Effectiveness rating 2

6. Asset maintenance

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

Observations

Policies and procedures for asset maintenance / sample activities

For the southern system, maintenance is controlled by an IT system (SAP) that coordinates tasks, incorporates condition, risk, breakdown and time based maintenance. Maintenance jobs are standardised which gives a quality and safety assurance and change management where by changing the standard job specification the work process is changed. Spare parts required for standard jobs and inventories are also contained in the system. By contrast, the northern system, which is the mining town site with restricted residential access, is not as well integrated with the mining operations, is not as well developed with its maintenance management. The SAP business application is used. Nickel West has transitioned through 3 platforms in recent years which were known as WSAP under WMC, GSAP under BHPBilliton and recently to 1SAP. The current 1SAP system uses SAP ERP6 as the platform. The maintenance module can interface to finance, supply and project systems modules which are used to varying degrees by maintenance personnel. Access to 1SAP is either through the SAP GUI or the SAP Portal. There is also a business warehouse module with ability for tracking key performance indicators but this is not utilised. The power of the system is not, as yet, fully harnessed as operators need to further develop their competence and familiarity. The system has some preventative maintenance schedules included but not a comprehensive set.

The asset management plan contains performance measures and lists significant maintenance plans. This implements the request from the last review. While the high level issues are captured, the low level issues at Leinster could be improved.

The Licensee provides first line maintenance and engages contractors to service their major maintenance outages as required. There is a plan to investigate and justify the purchase of a spare transformer to minimise the risk of an extended outage. Condition inspection of the lines is routinely carried out. Inventory of critical spares has been developed.

Training / resources / exceptions

Maintenance is scheduled well into the future and these actions are appropriate for the type of equipment. The resourcing is appropriate and ongoing training is evident as are the operating procedures and practices. High Voltage training occurs at Western Power and College of Electrical Training. Plant maintenance appears to take account of any expected failures in the licensed plant.

Evaluation Criteria summary

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

Response: Policies and procedures are documented. Some service levels are defined in the PPAs. The AMS further supports this criterion with service standards defined.

- Regular inspections are undertaken of asset performance and condition

Response: The SAP maintenance planning system fulfils this criterion by regular scheduling of inspections to assess condition. Time based schedules are set up for physical inspection, testing and collection of samples for condition based analysis (eg oil sampling, thermographic, etc). These were demonstrated on site.

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

Response: Corrective (condition based) and preventative maintenance plans are recorded in the SAP system. These were reviewed on site with the maintenance planner. The schedules are issued on a weekly basis. Completion rates are recorded as part of the overall maintenance analysis. The network is in good condition but controls could be improved by better use of SAP in the northern system.

Maintenance plans for emergencies were not evident and are not considered applicable due to infrequent occurrence.

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

Response: Failures are infrequent. There was no evidence of significant failure warranting adjustment of the plans within the audit period. Failed plant was examined in storage areas for failure causes.

- Risk management is applied to prioritise maintenance tasks

Response: Maintenance tasks and frequencies have been developed over a period of time using local experience and industry standards applied at the mine. The site supervisor advised maintenance will be prioritised according to the impact of any failure.

- Maintenance costs are measured and monitored

Response: Maintenance costs are recorded, measured and monitored by the site. Costs for the southern system are recharged to the energy group in Perth, where they are also reviewed.

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

Response: The AMS meets this criterion with maintenance strategies defined.

- Performance measures such as unplanned outages

Response: Outage log including forced outages has been implemented and was sighted. Level of investigation is dependent on cause and impact. This also involves upstream supplier when applicable.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power

quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual, Outage Log.						
Asset management performance						
Process	☑	Availability	☑	Use	☑	
Issues						
The maintenance is appropriate for the duty required. A better view of maintenance will be available at the next review when the asset management plan has been operational for a longer time and will allow for changes to be measured. The southern system is appropriately developed. From an inspection of the assets and reliability statistics, the northern system appears to be in good shape but the maintenance tools could be better utilised to ensure more certainty and consistency of maintenance. The northern system detracts from otherwise good performance.						
Recommendation						
Opportunity for improvement: For the northern system, certainty and consistency of maintenance could be improved by using the power of the SAP system by adding standard work specifications and more scheduled preventative maintenance tasks.						

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

7. Asset Management Information System (MIS)

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

Observations

Policies and procedures

The Licensee has a competent asset management information system with a number of elements. The maintenance management system based on the SAP business software system (described in section 6 above). The system is mine site wide with the Licensed network only a small part. The system allows for both time based and condition based activities.

The maintenance system links project management to scheduled tasks to standard work plans (assisting with safety and change management), asset register and parts inventory. Documentation and familiarity of the system appears appropriate. The system is integrated with the mine site in the southern system but is less developed in the northern system.

Access to write to the database is controlled (passwords) and changes are tracked. There is good documentation for data recovery procedures which include operating on the Perth office server and backing up the servers to ensure data integrity.

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

Evaluation Criteria summary

- Adequate system documentation for users and IT operators

Response: The SAP system is well documented. The system is intuitive with online assistance and documentation is rarely required. Due to the size of the organisation there are also a number of channels or people available to obtain help.

- Input controls include appropriate verification and validation of data entered into the system

Response: The system is easy to use with a maintenance focus rather than a database focus and includes appropriate verification and validation of data entered into the system.

- Logical security access controls appear adequate, such as passwords

Response: Logical control is adequate with hierarchical access by password. Personnel are automatically logged out of computer systems after periods of inactivity.

- Physical security access controls appear adequate

Response: Physical security is adequate with the system on access controlled mine sites.

Access to sites and the Perth offices is by swipe card. Visitors are required to be escorted.

- Data backup procedures appear adequate

Response: Data backup is reported by the site IT personnel to be carried out daily and weekly on all servers with weekly back up being stored off site.

- Key computations related to Licensee performance reporting are materially accurate

Response: There is minimal regular computation work other than meter data handled on spreadsheets. Validation checks are incorporated. Key computations related to Licensee performance reporting are materially accurate, to the extent possible to assess with visual inspection.

- Management reports appear adequate for the Licensee to monitor licence obligations

Response: No detailed management reports are generated by the SAP system which would assist to monitor licence obligations. The key reports are for outage logging and appear adequate.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual.

Asset management performance

Process	☑	Availability	☑	Use	☑	

Issues

None

Recommendation

None

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

8. Risk management

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

Observations

Policies and procedures
The Licensee has a documented risk management procedure and there is evidence that risk based approaches is being carried out.

The investigation of the provision of contingencies such as a spare transformer is a result of critical risk management. The Licensee has assessed and prioritised the threats to specific plant and developed contingencies for these threats which are based on assessment of risks.

The power quality measurement plan is a strategy to mitigate quality/reliability threats. Sample power quality surveys were sighted and no issues identified.

The risk management review and plan satisfied and closed the non-compliance identified in the last review.

Training
There is evidence of training and awareness by staff of risk based approaches.

Evaluation Criteria summary

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

Response: The AMS meets this criterion. The risk management section of the plan sets out risks, risk assessment and risk mitigation.

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

Response: The risk register is set out in the AMP. Some follow up was evident for the earthing transformer but further action is required to assess and justify mitigation strategies for other risks identified.

- The probability and consequences of asset failure are regularly assessed

Response: During the audit period, the risks of asset failures have been assessed based on probability and consequence parameters. Further assessment was not required in the audit period but a process to do so was not evident and should be defined.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety

and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual.						
Asset management performance						
Process	☑	Availability	☑	Use	☑	
Issues						
The risk management plan is new and success will be able to be better assessed in the next review when the effectiveness of the actions will be more evident.						
Recommendation						
Consideration for including regular review of identified risks and progress to resolving these in a compliance manual. Consideration should also be given to include the regular assessment of probability and consequence of asset failure.						

Contingency planning	Process/Policy rating B	Effectiveness rating 2

9. Contingency planning

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

Observations

Development of contingency plans / currency
The Licensee has good documentation of its data recovery plans.

The Licensee has documented the threats to specific plant and developed contingencies for these threats. An inventory of spare parts has been developed and there is an investigation into a spare transformer. Areas of improvement are identified and mitigation/response actions are listed.

The Licensee has detailed maintenance scheduled out for several years, with minor and major shutdowns allowed to deal with potential issues. Maintenance is partly conducted on condition based maintenance which monitors critical items for indicators of future failure (eg oil testing, thermographic assessment, pole inspections).

The maintenance regime is geared to keeping the plant operational without forced outages.

The power quality measurement plan is a strategy to mitigate quality/reliability threats.

Testing of contingency plans
The Licensee tests safety systems routinely.

The company conducts major incident training for the emergency services crews at site.

Evaluation Criteria summary

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

Response: The AMS meets this criterion with a section on contingency planning in the AMP. Critical spares are identified and being sourced. Standard spares such as poles, insulators and small transformers are on site.

The northern system has a formal arrangement for additional network support from another network operator and also has access to local contractors. The southern system has access to local contractors. Detailed plans for various scenarios have not been developed or tested. The asset management plan recommends definition of standby generation requirements.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power

quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual.						
Asset management performance						
Process	☑	Availability	☑	Use	☑	
Issues						
The contingency plan is new and success will be able to be better assessed in the next review when the effectiveness of the actions will be more evident. An understanding of the feasibility for installation of emergency generation options in a practical method is lacking for key points in the radial system.						
Recommendation						
Determine generation requirements, injection points and mobilisation plans for key points of supply.						

Financial planning	Process/Policy rating A	Effectiveness rating 1

10. Financial planning

The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term.

Observations

Financial planning process / plans
The Licensee carries out budgeting and monitoring processes. These are on 1 year and 5 year cycles and upgraded year by year. Long ranges forecasting provides business outlook over the next 5 to 10 years and includes major customer load estimates where possible. Financial planning of the network is not significant to company profitability or viability in the context of the core business being mining.

Evaluation Criteria summary

- The financial plan states the financial objectives and strategies and actions to achieve the objectives

Response: The Licensed assets are a small part of the company core business of mining which will determine the viability of the operations. The licensed electrical assets are part of that budgeting process. The overall budgets are related to objectives / strategies and actions to achieve the objectives of reliability and continuity of supply.

- The financial plan identifies the source of funds for capital expenditure and recurrent costs

Response: The Licensed assets are a small part of the mining electrical assets and are part of that budgeting process. The overall budget identifies the source of funds for capital expenditure and recurrent costs. Nearly all capital expenditure will be funded from mining development projects. Minimal capital is required for other reasons.

- The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)

Response: As the network is only part of the core business of mining detailed financial plans for the network are not relevant. Detailed financial plans for the mine are prepared. The Licensed assets do not attempt operating statements (profit and loss) and statement of financial position (balance sheets) but monitor costs with respect to budgets.

- The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period

Response: The licensee does not predict income for access to the network as any income is considered as revenue under the Licensee's associated retail licence. Profitability of the network per-se is immaterial.

- The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services

Response: The financial plan provides for the operations and maintenance, administration and minor capital expenditure requirements of the services. The licensed assets consume only a very small portion of a very large energy budget portfolio for the operations. The total energy budget includes income and expenditure for operation, maintenance and overhead costs. This is compiled on a complex spreadsheet to determine energy costs for the site.

- Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary

Response: When significant variation in expenditure or budget are noted this is investigated. This generally relates to internal misallocations that are reversed.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual, budget model.

Asset management performance

Process	☑	Availability	☑	Use	☑	

Issues

None

Recommendation

None

Capital expenditure planning	Process/Policy rating A	Effectiveness rating 1

11. Capital expenditure planning

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

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

Observations

Capital expenditure process / plans
The Licensee has budgeting and monitoring processes. These are on 1 year and 5 year cycles and upgraded year by year. Long ranges forecasting provides business outlook over the next 5 to 10 years.

Due to the nature of the customers connected to the network, most capital expansion and expenditure is justified against mining development projects. The funds for expansion or rearrangement of the network are provided from the mine project requiring the change.

Evaluation Criteria summary

- There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates

Response: The AMP sets out “capital expenditure” but there is no significant expenditure planned (nominal $5,000 per year in most years)

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

Response: The AMP sets out “capital expenditure” but these are for small items (nominal $5,000 per year except for $50,000 in one year).

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

Response: The AMP sets out that the asset life is most likely to be governed by mine life rather than asset life. The plan responds to asset condition.

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

Response: The AMP sets out a review process. NiW has financial review processes.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety

and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual.						
Asset management performance						
Process	☑	Availability	☑	Use	☑	
Issues						
None.						
Recommendation						
None						

Review of AMS	Process/Policy rating	Effectiveness rating
	A	Not Rated

12. Review of AMS

The asset management system is regularly reviewed and updated.

Observations

As a supplier of electricity the service delivery is heavily asset based and needs an AMS. There is ongoing review of the asset management plan.

Evaluation Criteria summary

- A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current

Response: The AMP assigns responsibility for review of the AMS to the Asset owner.

- Independent reviews (eg internal audit) are performed of the asset management system

Response: The AMP is too new for an internal review but such a review should be scheduled.

Asset management process and policy definition

Process	☑	Policy	☑	Documentation	☑	

Evidence: interviewed Asset Manager and staff on site listed. Documents: Include, Asset Management Plan, Risk management policy, Decommissioning plans, Preventative maintenance procedure, Maintenance management manual, Health, Safety and Environment management manual, BHPBilliton Code of Business Conduct, Power quality analysis sample report, Power procurement agreement sample, Meter drawings/documents, High Voltage Isolation manual, Fatal risk control standard and Switching manual.

Asset management performance

Process	☐	Availability	☐	Use	☐	

Issues

The asset management plan is new and there has been no review activity to assess.

Recommendation

The Asset Management System requires formal review every year. It is recommended that an internal review of the AMS by the asset manager should be scheduled to identify gaps and improvements. It recommended that this is carried out every 3 months and is included in a compliance manual.