



# 2019 Performance Audit & Asset Management System Review - EGL1

## Emu Downs Wind Farm Joint Venture

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## GLOSSARY

Abbreviation	Description
AEMO	Australian Energy Market Operator. The national market operator that succeeded IMO.
AFA	Arena Funding Agreement
AFE	Approval for expenditure process
AMP	Asset Management Plan
AMS	Asset Management System
BoP	Balance of Plant
CA	Connection Agreement
CCTV	Closed circuit TV
CMP	Compliance management program
CT	Current transformer
DSOC	Declared Sent Out Capacity
EDRF	Emu Downs Renewable Facility
EDSF	Emu Downs Solar Farm
EDWF	Emu Downs Wind Farm
ERA	Economic Regulation Authority
FY	Financial year
GES	Geographe Environmental Services
GWh	GigaWattHour
IT	Information Technology
kV	KiloVolt
LTI	Lost time injuries
MW	MegaWatt
N-1	Capacity to meet requirements with one unit out of service
NGER	National Greenhouse and Energy Reporting
O&M	Operations and Maintenance
OEM	Original equipment manufacturers
OSH	Occupational Safety and Health
P&L	Profit and loss
PLC	Programmable logic controller
PV	Photovoltaic
RCA	Root cause analysis
SAP	Business management database system
SVC	Static VAr Compensator
SWIN	South West Interconnected Network
SWIS	South West Interconnected System (Network and generators)
SWOT	Strength, weakness, opportunities and threats
THD	Total harmonic distortion
UGL	UGL Engineering Pty Ltd. EDSF installer and O&M Contractor
UPS	Uninterruptable power supply
Vestas	EDWF OEM and O&M contractor.
WEM	Wholesale Electricity Market
WFS	Wind forecasting system
WP	Western Power
WTG	Wind Turbine Generator

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	NAOMI DONOHUE	APRIL 2019
PREPARED BY	NICOLE DAVIES	OCTOBER 2019
CHECKED BY	SIMON ASHBY	SEPTEMBER 2019
REVISION	4	24 OCTOBER 2019

## 1. EXECUTIVE SUMMARY,

The Licensee is EDWF Holdings 1 Pty Ltd & EDWF Holdings 2 Pty Ltd (trading as Emu Downs Wind Farm Joint Venture). Emu Downs Wind Farm Joint Venture holds the Generation Licence (EGL1).

### Asset Overview

The Emu Downs Joint Venture is equally owned by EDWF Holdings 1 Pty Ltd and EDWF Holdings 2 Pty Ltd, which in turn are owned by the APA Group. EDWF Manager Pty Ltd is a company owned by the APA Group and tasked with managing the ongoing operations of the Emu Downs Wind Farm Joint Venture.

The Emu Downs Wind Farm Joint Venture is located approximately 200km north of Perth and includes the Emu Downs Wind Farm (EDWF) and the Emu Downs Solar Farm (EDSF). The EDWF is made up of 48 Vestas V82 Wind Turbine Generators (WTGs) with a total rating of 79.2MW. The EDSF is made up 8 SMA Inverters with a total rating of 20MW. The Declared Sent Out Capacity (DSOC) for the EDWF is 80MW. The Emu Downs Wind Farm Joint Venture 132/22kV substation is connected to the South West Interconnected Network (SWIN) via two 132kV transmission lines.

The Emu Downs Wind Farm Joint Venture exports all power generated into the SWIN. A Connection Agreement (CA) and Network Access Agreement (NAA) between the Western Power and EDWF Holdings 1 Pty Ltd and EDWF Holdings 2 Pty Ltd sets out the terms of the Emu Downs Wind Farm Joint Venture's connection to the SWIN.

Emu Downs Wind Farm Joint Venture main and check bi-directional tariff metering equipment is provided by Western Power and located at the two 132kV connection points in the 132/22kV substation. These meters record the combined generation from the EDWF and EDSF. Emu Downs Wind Farm Joint Venture exports between 280 to 320 GWh of energy per year.

The EDRF was commissioned in June 2006 with 48 turbines (each with 1.65 MW generating capacity), a substation, interconnection to the main 132 kV grid, an administration/stores building and a network of access roads. EDSF consisting of two sets of 4 x 2.5MW PV arrays was added in 2018, during the reporting period, to the generation but the DSOC remains at 80MW.

The power station is operated and maintained on long term contract by sub-contractors, Vestas and UGL.

Emu Downs Wind Farm Joint Venture has issued a Consultancy Brief to undertake its fifth Performance Audit and Asset Management System Review as required by the Economic Regulation Authority (the Authority). Emu Downs Wind Farm Joint Venture holds a Generation Licence (Licence Number EGL1) under the Electricity Industry Act 2004.

Sections 13 and 14 of the Electricity Industry Act 2004 require as a condition of every licence that the licensee must, not less than once in every period of 24 months (or any longer period that the Authority allows) calculated from the grant of the licence, provide the Authority with a performance audit and a asset management system review report by an independent expert acceptable to the Authority.

Geographe Environmental Services has been approved by the Authority (Ref: D202338/ 27<sup>th</sup> May 2019) to undertake the works subject to development of an audit plan.

The period for the audit and review is 1<sup>st</sup> July 2015 to 30<sup>th</sup> June 2019 and the report is due to be submitted to the Authority on or before 30<sup>th</sup> September 2019. An extension has been sought to allow for unscheduled delays.

It is confirmed that the licensee facilitated the audit and reviewed process by providing the audit team;

- Access to the facilities and business premises identified in the audit and review plan.
- Access to materials and information sources that the auditor needs to conduct the audit or review, including data, reports, records and any other relevant information.
- Access to the relevant personnel at each of the Emu Downs Wind Farm Joint Venture sites that were audited.
- An introduction to persons, other than employees of the licensee, who are relevant to the audit and review, such as site contractors.

### **Performance Audit and Asset Management Review Objectives**

The Asset Management System Review and the Performance Audit have been conducted in order to assess the effectiveness of the Emu Downs Wind Farm Joint Venture's Asset Management Systems and level of compliance with the conditions of its Generation Licence EGL1. Through the execution of the Audit Plan, field work, assessment and testing of the control environment, the information system, control procedures and compliance attitude, the audit team members have gained reasonable assurance that Emu Downs Wind Farm Joint Venture had an effective asset management system and has complied with its Generation Licence, with the exception of obligations 105 and 124 relating to payment of licence fees and reporting of compliance requirements. It is the auditors' opinion that the omission of the reporting of the late payment of fees in the annual compliance report was due to administrative procedures. Compliance and integrity of reporting by the Licensee is considered well managed and is comprehensively detailed in the Compliance Manual for the Authority and other statutory organisations. Issues arising from late payment of fees and reporting of compliance requirements have been addressed by the Licensee proactively by the provision of resources and increased operational control.

The Licensee has implemented the recommendations of the previous audit report, the effectiveness of the actions is evident in the compliance history during the audit period (refer Table 3). Implementation of corrective actions were confirmed, tested and have been regularly reviewed during the audit period.

The site audit was conducted on the 30<sup>th</sup> and 31<sup>st</sup> of July 2019 and this audit report is an accurate representation of the audit team's findings and opinions. The Auditors confirm that the Licensee provided full access as required by the Audit Guidelines (2019), in respect to; access to facilities and business premise, access to data, reports, minutes, documentation, correspondence and process control data. Additionally, the Licensee ensured the appropriate personnel were available and provided information where possible as requested for external persons relevant to the audit process.

Emu Downs Wind Farm Joint Venture have established a sound control environment, the management philosophy and operating style (incorporating the decision compass and STARS culture i.e Safe, Trustworthy, Adaptable, Results, Service), organisational structure, assignment of authority and responsibilities, the use of internal audit, the use of information technology and the skills and experience of the relevant staff members were tested and verified during the audit process.

## 1.1 Performance Audit Summary of Findings

The majority of licence obligations reviewed were found to be compliant during the audit, with the exception of Electricity Compliance Reporting Manual Ref 105 and 124 (refer Appendix 1 for further details). The organisation has established processes and provided resources to ensure compliance requirements are met.

A two-dimensional rating scale (refer Section 5.1.6.1 of the Audit Guidelines) was used in the Audit report to summarise the compliance rating for each licence condition. Each obligation was rated for both the adequacy of existing controls and the compliance with the relevant licence obligation. The methodology for the Audit has been clearly defined in the Audit Plan.

A comprehensive report of the audit findings is included in Appendix 1.

## 1.2 Performance Audit Excluded Conditions

Some of the reporting obligations for EGL1 have been excluded from the audit because they are not applicable to Emu Downs Wind Farm Joint Venture. There are no Type 1 reporting requirements applicable to EGL1. Excluded compliance obligations are detailed in Table 1 below;

**Table 1 Performance Audit Excluded Conditions**

Compliance Manual Reference	Legislative Reference	Reason For Exclusion
120	Electricity Industry Act section 11 Generation Licence, condition 5.2.4	Individual performance standards have not been prescribed by the Authority.
401	Electricity Industry Metering Code clause 5.16	The Network Operator collects the energy data.



	Generation Licence, condition 4.1.1	
405	Electricity Industry Metering Code clause 5.18 Generation Licence, condition 4.1.1	The network operator has access to their own tariff meters
407- 408	Electricity Industry Metering Code clause 5.19(2) & (3)  Generation Licence, condition 4.1.1	The connection point is with the network operator.
	Section 18	This section is not applicable to Emu Downs Wind Farm Joint Venture as there have been no specific conditions and obligations attached to the generation licence.

The performance audit was conducted in a period over July to August involving one visit to site. The audit required 90 hours of Nicole Davies time.

**Table 2 Audit Compliant and Control Rating Scales**

Performance Audit Compliance & Controls Rating Scales			
Adequacy of Controls Rating		Compliance Rating	
Rating	Description	Rating	Description
A	Adequate controls – no improvement needed	1	Compliant
B	Generally adequate controls – improvement needed	2	Non-Compliant – minor impact on customers or third parties
C	Inadequate controls – significant improvement needed	3	Non-Compliant – moderate impact on customers or third parties
D	No controls evident	4	Non-Compliant – major impact on customers or third parties
NP	Not Performed	NR	Not rated – Determined Not Applicable during the audit period

The Generation Licence compliance elements that were included in the scope of this audit because they are defined in Table 3, are further detailed in Appendix 1.

**Table 3 Performance Audit Compliance Summary**

Compliance Obligation Reference No.	Licence Reference	Audit Priority	Adequacy of Controls Rating					Compliance Rating				
			A	B	C	D	NP	1	2	3	4	NR
SECTION 8: TYPE 1 REPORTING REQUIREMENTS												
THERE ARE NO TYPE 1 REPORTING REQUIREMENTS APPLICABLE TO EGL1												
SECTION 11: ELECTRICITY INDUSTRY ACT - LICENCE CONDITIONS AND OBLIGATIONS												
101	Electricity Industry Act section 13(1) Generation Licence condition 5.3.1	5	A					1				
102	Electricity Industry Act section 14(1)(a) Generation Licence condition 5.1.1	5	A					1				
103	Electricity Industry Act section 14(1)(b) Generation Licence condition 5.1.2 & 5.1.3	4	A					1				
104	Electricity Industry Act section 14(1)(c) Generation Licence condition 5.1.4	5	A					1				
105	Electricity Industry Act section 17(1) Generation Licence condition 4.2.1	4		B					2			
106	Electricity Industry Act section 31(3) Generation Licence condition 4.1.1	5	A					1				
107	Electricity Industry Act section 41(6) Generation Licence condition 4.1.1	4	A					1				
SECTION 12: ELECTRICITY LICENCES - LICENCE CONDITIONS AND OBLIGATIONS												
119	Electricity Industry Act section 11 Generation Licence condition 4.3.1	4	A					1				
121	Electricity Industry Act section 11 Generation Licence condition 5.3.2	4	A					1				
122	Electricity Industry Act section 11 Generation Licence condition 5.1.5	4	A					1				
123	Electricity Industry Act section 11 Generation Licence condition 4.4.1	4	A									NR
124	Electricity Industry Act section 11 Generation Licence condition 4.5.1	4		B					2			
125	Electricity Industry Act section 11 Generation Licence condition 3.8.1 & 3.8.2	4	A									NR
126	Electricity Industry Act section 11 Generation Licence condition 3.7.1	4	A					1				

SECTION 14: ELECTRICITY INDUSTRY METERING CODE - LICENCE CONDITIONS AND OBLIGATIONS											
324	Generation Licence condition 4.1.1 Electricity Industry Metering Code, clause 3.3B	4					NP				NR
339	Generation Licence condition 4.1.1 Electricity Industry Metering Code CI 3.27	4	A								NR
364	Electricity Industry Metering Code CI 3.27 Generation Licence condition 4.1.1	4					NP				NR
371	Electricity Industry Metering Code CI 4.4(1) Generation Licence condition 4.1.1	5					NP				NR
372	Electricity Industry Metering Code CI 4.5(1) Generation Licence condition 4.1.1	5					NP				NR
373	Electricity Industry Metering Code CI 4.5(2) Generation Licence condition 4.1.1	4					NP				NR
388	Electricity Industry Metering Code CI 5.4(2) Generation Licence condition 4.1.1	5					NP				NR
402	Electricity Industry Metering Code CI 5.17(1) Generation Licence condition 4.1.1	4					NP				NR
406	Electricity Industry Metering Code CI 5.19(1) Generation Licence condition 4.1.1	5					NP				NR
410	Electricity Industry Metering Code CI 5.19(6) Generation Licence condition 4.1.1	5					NP				NR
416	Electricity Industry Metering Code CI 5.21(5) Generation Licence condition 4.1.1	4					NP				NR
417	Electricity Industry Metering Code CI 5.21(6) Generation Licence condition 4.1.1	4					NP				NR
435	Electricity Industry Metering Code CI 5.27 Generation Licence condition 4.1.1	4					NP				NR
448	Electricity Industry Metering Code CI 6.1(2) Generation Licence condition 4.1.1	4					NP	1			
451	Electricity Industry Metering Code CI 7.2(1) Generation Licence condition 4.1.1	5	A					1			

453	Electricity Industry Metering Code CI 7.2(4) Generation Licence condition 4.1.1	4					NP					NR
454	Electricity Industry Metering Code CI 7.2(5) Generation Licence condition 4.1.1	4					NP					NR
455	Electricity Industry Metering Code CI 7.5 Generation Licence condition 4.1.1	4					NP					NR
456	Electricity Industry Metering Code CI 7.6(1) Generation Licence condition 4.1.1	4					NP					NR
457	Electricity Industry Metering Code CI 8.1(1) Generation Licence condition 4.1.1	5					NP					NR
458	Electricity Industry Metering Code CI 8.1(2) Generation Licence condition 4.1.1	5					NP					NR
459	Electricity Industry Metering Code CI 8.1(3) Generation Licence condition 4.1.1	5					NP					NR
460	Electricity Industry Metering Code CI 8.1(4) Generation Licence condition 4.1.1	4					NP					NR
461	Electricity Industry Metering Code CI 8.3(2) Generation Licence condition 4.1.1	5					NP					NR
<b>SECTION 16: ELECTRICITY LICENCES - LICENSEE SPECIFIC CONDITIONS AND OBLIGATIONS</b>												
THIS SECTION IS NOT APPLICABLE TO EMU DOWNS WIND FARM JOINT VENTURE AS THERE HAVE BEEN NO SPECIFIC CONDITIONS AND OBLIGATIONS ATTACHED TO THE GENERATION LICENCE												

**Table 4 Compliance and controls ratings summary table**

		Compliance Rating					
		1	2	3	4	N/R	TOTAL
Controls Rating	A	11	-	-	-	3	14
	B	-	2	-	-	-	2
	C	-	-	-	-	-	0
	D	-	-	-	-	-	0
	N/P	1	-	-	-	21	22
	TOTAL	12	2	0	0	24	38

### 1.3 Asset Management System Review Summary

The asset management system was found to be effective. There were two sub-components noted where amendments to processes and policies could be further improved to adequately document the required performance of the assets. In both instances, the key requirements i.e the asset management of the solar farm and the differing criteria for the risk assessment used by APA and Vestas are being met, although improvements could be considered to further enhance the processes.

As required by section 5.1.6.2 of the Audit & Review Guidelines (March 2019) Table 5 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 9 and Table 10 (refer Section 3.3, Methodology for Asset Management Review). The rating was determined by the auditor's judgement based on the execution of the Audit Plan.

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

**Table 5 Asset Management System: Effectiveness Summary**

Asset Management System	Asset Management Process And Policy Definition Adequacy Rating	Asset Management Performance Rating
<b>1. Asset planning</b>	A	1
1.1 Asset management plan covers the processes in this table	A	1
1.2 Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning	A	1
1.3 Service levels are defined in the asset management plan	A	1
1.4 Non-asset options (e.g. demand management) are considered	A	1
1.5 Lifecycle costs of owning and operating assets are assessed	A	1
1.6 Funding options are evaluated	A	1
1.7 Costs are justified and cost drivers identified	A	1
1.8 Likelihood and consequences of asset failure are predicted	A	1
1.9 Asset management plan is regularly reviewed and updated	A	2
<b>2. Asset creation and acquisition</b>	A	1
2.1 Full project evaluations are undertaken for new assets, including comparative assessment of non- asset options	A	1
2.2 Evaluations include all life-cycle costs	A	1
2.3 Projects reflect sound engineering and business decisions	A	1

Asset Management System	Asset Management Process And Policy Definition Adequacy Rating	Asset Management Performance Rating
2.4 Commissioning tests are documented and completed	A	1
2.5 Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood	A	1
<b>3. Asset disposal</b>	A	1
3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process	A	1
3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	A	1
3.3 Disposal alternatives are evaluated	A	1
3.4 There is a replacement strategy for assets	A	1
<b>4. Environmental analysis</b>	A	1
4.1 Opportunities and threats in the asset management system environment are assessed	A	1
4.2 Performance standards (availability of service Capacity, continuity, emergency response, etc.) are measured and achieved	A	1
4.3 Compliance with statutory and regulatory requirements	A	1
4.4 Service standard (customer service levels etc) are measured and achieved.	A	1
<b>5. Asset operations</b>	A	1
5.1 Operational policies and procedures are documented and linked to service levels required	A	1
5.2 Risk management is applied to prioritise operations tasks	A	1
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	A	1
5.4 Accounting data is documented for assets	A	1
5.5 Operational costs are measured and monitored	A	1
5.6 Staff resources are adequate and staff receive training commensurate with their responsibilities.	A	1
<b>6. Asset maintenance</b>	A	1
6.1 Maintenance policies and procedures are documented and linked to service levels required	A	1
6.2 Regular inspections are undertaken of asset performance and condition	A	1
6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	A	1

Asset Management System	Asset Management Process And Policy Definition Adequacy Rating	Asset Management Performance Rating
6.4 Failures are analysed and operational / maintenance plans adjusted where necessary	A	1
6.5 Risk management is applied to prioritise maintenance tasks	A	1
6.6 Maintenance costs are measured and monitored	A	1
<b>7. Asset Management Information System</b>	A	1
7.1 Adequate system documentation for users and IT operators	A	1
7.2 Input controls include suitable verification and validation of data entered into the system	A	1
7.3 Security access controls appear adequate such as passwords	A	1
7.4 Physical security access controls appear adequate	A	1
7.5 Data backup procedures appear adequate and backups are tested	A	1
7.6 Computations for licensee performance reporting are accurate	A	1
7.7 Management reports appear adequate for the licensee to monitor licence obligations	A	1
7.8 Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	A	1
<b>8. Risk management</b>	A	1
8.1 Risk management policies and procedures exist and are applied to minimise internal and external risks	A	1
8.2 Risks are documented in a risk register and treatment plans are implemented and monitored	A	2
8.3 Probability and consequences of asset failure are regularly assessed	A	1
<b>9. Contingency planning</b>	A	1
9.1 Contingency plans are documented understood and tested to confirm their operability and to cover higher	A	1
<b>10. Financial planning</b>	A	1
10.1 The financial plan states the financial objectives and identifies strategies and actions to achieve those	A	1
10.2 The financial plan identifies the source of funds for capital expenditure and recurrent costs	A	1
10.3 The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	A	1
10.4 The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period	A	1

Asset Management System	Asset Management Process And Policy Definition Adequacy Rating	Asset Management Performance Rating
10.5 The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	A	1
10.6 Large variances in actual/budget income and expenses are identified and corrective action taken where necessary	A	1
<b>11. Capital expenditure planning</b>	A	1
11.1 There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates	A	1
11.2 The capital expenditure plan provides reasons for capital expenditure and timing of expenditure	A	1
11.3 The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	A	1
11.4 There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented	A	1
<b>12. Review of AMS</b>	A	1
12.1 A review process is in place to ensure the asset management plan and the asset management system described in it remain current	A	1
12.2 Independent reviews (e.g. internal audit) are performed of the asset management system	A	1

The Audit & Review Guidelines (March 2019) 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). None fall into these categories.



## 2. PERFORMANCE AUDIT

### 2.1 Performance Audit Scope

In executing the Audit Plan and in line with the Audit & Review Guidelines (March 2019) the auditors, when assessing if the licensee has complied with its licence obligations, applied a level of scrutiny that corresponds to a “reasonable assurance engagement”. This has been further detailed within the audit plan (refer Paragraph 12(a)(i)(a) of ASAE 3000, June 2014).

This is the fifth audit of EGL1. The organisation has implemented the recommendations of the previous audit and as required by Section 11.3 of the Audit Guidelines (March 2019). Table 6 below details how all recommendations were resolved in the current audit period.

**Table 6 Previous Audit Non-compliances and Recommendations**

Table of Previous Non-Compliances & Audit Recommendations				
A Resolved before end of previous audit period				
Reference (no./year)	(Compliance rating/ Legislative Obligation/ details of the issue)	Auditors' Recommendation or action taken	Date Resolved	Further action required
Not applicable				
B Resolved during the current audit period				
Reference (no./year)	(Compliance rating/ Legislative Obligation/ details of the issue)	Auditors' Recommendation or action taken	Date Resolved	Further action required

1/2015	106	It was recommended that the Licensee complete and routinely update a risk assessment for the substation plant. The Year Plans were updated to reflect the outcome of the risk assessment for the 2016-2017 Year and each subsequent year during the audit period.	8/1/2016	NIL
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**C Unresolved at the end of the current audit period**

Reference (no./year)	(Compliance rating/ Legislative Obligation/ details of the issue)	Auditors' Recommendation or action taken	Date Resolved	Further action required
Not Applicable				

## 2.2 Recommendations and Action Plans

Recommendations made within the report are detailed below and will be reviewed and included in the post audit implementation plan by the licensee to ensure compliance with requirements.

**Table 7 Current audit non-compliances and recommendations**

CURRENT AUDIT NON COMPLIANCES/RECOMMENDATIONS			
A. RESOLVED DURING THE CURRENT AUDIT PERIOD			
There are no non compliances or recommendations raised and resolved during the audit period.			
B. UNRESOLVED AT END OF CURRENT AUDIT PERIOD			
Reference (no./year)	Non Compliance/Controls Improvement (Rating/ Legislative Obligation/ Details of Non Compliance or Inadequacy of Controls)	Auditors' Recommendation	Management action taken by end of Audit period
01/2019 – Ref 105	<b>Non-Compliant/B2 /105</b> The licensee has not met the obligations in regards to payment of prescribed licence fees on 2 occasions during the audit period.	It is recommended, to ensure ongoing compliance, the Licensee update the Compliance Manual to reference both the Annual and Quarterly licence fees payable and the associated Compliance Calendar to ensure that the requirement to pay Annual Licence fees occurs within 30 days after the anniversary of issue of the licence (i.e before the 23 <sup>rd</sup> July each year) and the quarterly Standing Data charges are paid within 30 days of receipt of invoice.	Nil - Refer Post Audit Action Plan
02/2019 – Ref 124	<b>Non-Compliant/B2 /124</b> The Annual Compliance Report for 2015-2016 Year did not reflect the late payment of the licence fee for the Standing Data Charge quarter commencing July 2015.	It is recommended the Licensee to establish process to ensure that all non-compliances are reported in a Compliance Report which is to be submitted by the 31st August annually. The 2015-2016 Compliance Report prepared during the audit period did not report a non-	Nil - Refer Post Audit Action Plan

B. UNRESOLVED AT END OF CURRENT AUDIT PERIOD			
		<p>compliance in reference to late payment of the licence fee for the 2015 Standing Data Charges for the July quarter. It is noted that during the audit period, the responsibility for monitoring Compliance is managed by an APA representative and the reporting function of the compliance Report was the responsibility of the Operations Manager. A process to ensure compliance requirements have been met and documented liaison relating to the legislative requirements and content of the Compliance Report prior to submission to the Authority is required This would ensure all non-compliances are clearly identified and reported.</p>	

### 3. ASSET MANAGEMENT SYSTEM EFFECTIVENESS REVIEW

#### 3.1 AMS Review Scope

The scope of the AMS review includes an assessment of adequacy and effectiveness of the Emu Downs Wind Farm Joint Venture's Asset Management System by evaluating during the audit period 1<sup>st</sup> July 2015 to 30<sup>th</sup> June 2019 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 Generation Licence issued by the Economic Regulation Authority to Emu Downs Wind Farm Joint Venture.

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

- a risk based approach to auditing using the risk evaluation model set out in ISO31000:2018,
- 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- review plan as described in the Guidelines.
- the Asset Management System Review has been carried out as a 'limited assurance engagement'.

**Table 8 Interviewed Personnel during the Review**

Company	Name	Designation
APA Group	Paul McLagan	Operations Manager - Power Division
APA Group	Stuart Dodds	Asset Manager Renewables and Transmission - Power Division
APA Group	Glen Thomsen	Commercial Manager - Power Division
APA Group	Naomi Donohue	Risk & Compliance Manager - Power Division
Vestas	Ian Manns	EDWF Site Supervisor
UGL	Thomas Ray	Commissioning Engineer
UGL	Gary Stone	Operations Engineer - Renewables
UGL	John Maroney	Junior Operations Engineer - Renewables

The key documents and other information sources are detailed below and further in Appendix 2.

**Table 9 Key Reference Documents**

Ref #	Title
1	01 ADMIN
2	330-MAN-CMP-8000 - EDRF BRF Wind and Solar Farm Compliance Manual.pdf
3	Superseded 33160101R0 Compliance Monitoring Program.pdf
4	33170101R1 EDWF Year Plan 2017-2018.pdf
5	33180101R1 EDWF Year Plan 2018-2019.pdf
6	33190101R EDWF Year Plan 2019-2020 Rev 1.pdf
7	33180104R0 - CMP Report.pdf
8	Company Structure 2019.pdf
9	EDRF 33180103R3 - Risk Management - Rev 3.pdf
10	EDRF 33190101S - Sapphire License.pdf
11	EDRF Document Register - 2019.pdf
12	EDRF Risk Guide 2018.pdf
13	EDRF Risk Summary 2019.pdf
14	EDWF - 190216-01 - Farm Rules Rev 1.pdf
15	EDWF - 280116-01 - OH&S Policy.pdf
16	EDWF - 280116-02 - Environmental Policy.pdf
17	EDWF 33170103R1 - Project Procedure.pdf
18	EDWF 33180101R4 - AMS Rev 4.pdf
19	EDWF O&M Report - July 2015 to June 2016.pdf
20	EDWF O&M Report - July 2016 to June 2017.pdf
21	EDRF O&M Report - July 2017 to June 2018.pdf
22	EDRF OM Report - July 2018 to June 2019.pdf
23	EDWF Operating Protocol V2 Final_signed.pdf
24	EDWF Risk Register 2016.pdf
25	EDWF Risk Register 2017.pdf
26	EDWF Risk Register 2018.pdf
27	EDWF Risk Register 2019.pdf
28	EDWF Risk Summary 2016.pdf
29	EDWF Risk Summary 2017.pdf
30	EDWF Risk Summary 2018.pdf
31	EDWF Year Plan 2015-2016 Rev 1.pdf
32	EDWF Year Plan 2016-2017 Rev 0.pdf
33	02 FINANCE
34	2. FY2016 APT Audit Report.pdf
35	2. FY2016 APTIT Audit Report.pdf
36	2. FY2017 APT Audit Report.pdf

Ref #	Title
37	2. FY2017 APTIT Audit Report.pdf
38	2. FY2018 APTIT Auditor Report.pdf
39	2. HY2019 APT Audit Report.pdf
40	2. HY2019 APTIT Audit Report.pdf
41	03. Document list.xlsx
42	3.1 Profit & Lose - EDSF.xlsx
43	3.1 Profit & loss - EDWF.xlsx
44	3.2 Balance Sheet - EDSF.xlsx
45	3.2 Balance Sheet - EDWF.xlsx
46	3.3 Revenue Projections - EDWF.xlsx
47	4. Funding - EDWF - Need to review.pdf
48	6. FY19 Capex Plan - EDWF.pdf
49	6. FY20 Capex Plan - EDSF.pdf
50	6. FY20 Capex Plan - EDWF.pdf
51	7. Capex Act v Bud FY19.xlsx
52	08. EDRF FAR.xlsx
53	8. Capex Review Process.pdf
54	9. O&M Cost Drive - EDSF.pdf
55	9. O&M Cost Drive - EDWF.pdf
56	12. Fix Asset Register - EDSF.xlsx
57	12. Fix Asset Register- EDWF.xlsx
58	14. NTI Green Power Accreditation Invoice June 2016 - EDWF.pdf
59	14. NTI Green Power Accreditation Invoice June 2017 - EDWF.pdf
60	14. NTI Green Power Accreditation Invoice June 2018 - EDWF.pdf
61	14. NTI Green Power Accreditation Payment Jun 2016 - EDWF.pdf
62	14. NTI Green Power Accreditation Payment Jun 2017 - EDWF.pdf
63	14. NTI Green Power Accreditation Payment Jun 2018 - EDWF.pdf
64	15. Authority Invoice June 2016 - EDWF.pdf
65	15. Authority Invoice June 2017 - EDWF.pdf
66	15. Authority Invoice June 2018 - EDWF.pdf
67	15. Authority payment June 2016 - EDWF.pdf
68	15. Authority payment June 2017 - EDWF.pdf
69	15. ERA payment June 2018 - EDWF.pdf
70	03 IT
71	EDWF System Recovery Document 2019.pdf
72	EDWFS _ Business Impact Analysis 2018.pdf
73	EDWFS System Recovery Sheet 2019.pdf
74	IM-090_INSTALLATION_INSTRUCTIONS.pdf
75	IT Backup Standard v1.2.pdf
76	Linux Environment and Oracle Database_SRD.pdf

Ref #	Title
77	MD70 Wind Forecast System.pdf
78	04 ERA
79	Approval of auditor - 2019 Audit and Review - EGL001 - Emu Downs Wind Fa....pdf
80	AUDITREPORT-6202-EDWF PA&AMSR 2015-01.1.pdf
81	EDRF Compliance Register 17-18.pdf
82	EDWF - 20816-01 - Economic Regulation Authority Compliance Report July 2015 to June 2016.pdf
83	EDWF - 110718-01 - Economic Regulation Authority Compliance Report July 2017 to June 2018.pdf
84	EDWF - 220817-01 - Economic Regulation Authority Compliance Report July 2016 to June 2017.pdf
85	EDWF - Post Audit Plan 2015 - Progress 15-12-16.pdf
86	EDWF Licence EGL01 - 2018.pdf
87	EDWF Licence Map.pdf
88	Economic Regulation Authority - Audit Guidelines - 2019.PDF
89	Letter to Emu Downs - 2015 Audit & Review - EGL001.pdf
90	Letter to licensee - Commencement of audit and review - 2019 Audit and R....pdf
91	05 VESTAS
92	Asset%20Management%20Plan_Emu%20Downs%20-%2009112017.pdf
93	Vestas SAP database
94	0544 EDSF OM Monthly Meeting Minutes_20190613_.pdf
95	EDWF Substation Scheduled Maintenance Rev 3 - 12-3-19.pdf
96	EDWF Substation Spares 12-03-19.xls
97	EDRF Schedule Maintenance.xls
98	EDRF HV Switching 2018.pdf
99	EDWF - 021118-01 - WTG Availability.pdf
100	APA.WA.CA.699_Emu Downs OM_Executed Word Searchable.pdf
101	WA Elc Contractor Notification.pdf
102	WA Elc Contractor Licence_2018-02-19.pdf
103	EDWF - 031117-01 - WTG Availability.pdf
104	INS SUS-IMP-EWC ASP_Extreme weather (002).pdf
105	EDWF - 131016-01 - WTG Availability.pdf
106	EDWF - 041115-01 - WTG Availability.pdf
107	WHSP\Addendum 4 - EDWF Risk Register and Control Matrix.doc
108	WHSP\Addendum 4 - Site Risk Register.pdf
109	WHSP\Addendum 6 - Environmental Aspects and Control Mechansims.pdf
110	WHSP\Addendum 6 - EDWF Environmental Aspects and Control Mechansims.docx
111	WHSP\Addendum 7 - Safety Environmental Check Form.pdf
112	WHSP\Addendum 11 - EDWF ERP Rev F.DOC
113	WHSP\Addendum 11 - Emergency Response Plan.pdf



Ref #	Title
114	WHSP\Addendum 12 - Health and Safety Incident Reporting Requirements.pdf
115	WHSP\EDWF WHSEMP - SC016666.pdf
116	WHSP\Noise_measurement_summary_NM82-1650_2004-01-19.pdf
117	WHSP\VCOHSM 0055-5622.pdf
118	WHSP\Vestas ASP Standard - Fitness for Work.pdf
119	WHSP\Vestas_Drug%20%20Alcohol-Free%20Workplace%20Policy%20R.1.pdf
120	0000-2968.pdf
121	0000-9776.pdf
122	0003-9663.pdf
123	20190731114817535.pdf
124	Asset Criticality C ED CR M W S E.xlsx
125	02 EDWF OM Notes - Feb 2019.pdf
126	06 UGL Contract #126-144
145	07 WESTERN POWER
146	EDRF - 260718-01 - Maintenance Schedule.pdf
147	EDRF - Operating Agreement - Contacts.pdf
148	EDWF - 090816-01 - Maintenance Schedule.pdf
149	EDWF - 220817-02 - Maintenance Schedule.pdf
150	EDWF - 240915-01 - Maintenance Schedule.pdf
151	EDWF Operating Protocol V2 Final_signed.pdf
152	Emu Downs Deed of Variation - WP Execution Page.pdf
153	Emu Downs Deed of Variation & Restated Connection Agreement.pdf
154	Network Access Agreement Conformed Copy.pdf
155	08 MEETINGS
156	MCM monthly meetings notes # 158-201
202	EDWF O & M Notes #203-248
249	EDSF O & M Notes #250-265
266	08 MISC
267	EDRF 33180104S - SVC Air-con.pdf
268	EDWF-E-5212 Rev 03.pdf
269	EDWF-E-5213-1 Rev 03.pdf
270	EDWF-E-5213-4 Rev 04.pdf
271	Risk Assessment - SVC Air-con.pdf
272	SVC DRAFT Arc Flash Safety RA 20th May 2019.pdf
273	500-PR-0004.pdf
274	500-PR-0005.pdf
275	ARENA LSS Project Plan EDSF 15 June 2016.pdf
276	EDWF commissioning reports
277	Emu Downs Wind Farm - AMP.docx
278	Operation and Maintenance Plan - EMU DOWNS 2019.pdf"

Ref #	Title
279	0544 EDSF OM Monthly Meeting Minutes_20190214.pdf"
280	3200-0544 Emu Downs - Emergency Response Plan Rev B.pdf"
281	3200-0544 Emu Downs Project Safety Management Plan Rev 0A.pdf"
282	3200-0544-PLN-003_R1 - Project Quality Plan.pdf"
283	20170109 - 0544 - UGL Electrical Contractor's Licence - WA.pdf"
284	Avail Calc Summary 2019.pdf"
285	EDSF O&M HSSE Risk Register R0A - EIMS-7-5448 - Section 2 BR.pdf
286	EDSF-MAN-OM-0001_1_AB.pdf"
287	Emu Downs - Operating Protocol - Rev 0.pdf

The review was conducted in conjunction with the Performance Audit during July – August 2019 and included desktop review and two day's audit on site to execute review plan, interview sessions and report writing. In total the review required 90 hours of Simon Ashby's time.

### **3.2 Objective of the Asset Management System Review**

The objective of the review is to examine the effectiveness of the processes used by the Emu Downs Wind Farm Joint Venture 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.

### **3.3 Methodology for Asset Management System Review**

The audit methodology detailed in the Audit and Review Guidelines – Electricity and Gas Licences (March 2019) was used in the execution of the Asset Management System Review and is detailed in the Audit Plan.

### **3.4 Asset Management System Effectiveness Rating**

The Audit and Review Guidelines – Electricity and Gas Licences (March 2019) (section 5.1.6.2) 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 9 and Table 10. It is left to the judgement of the auditor to determine the most appropriate rating for each asset management process.

**Table 10 Asset Management Process and Policy Definition Adequacy Ratings**

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

**Table 11 Asset Management Performance Ratings**

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

### **3.5 Deviations from the Review Plan**

There have been no deviations from the Review plan.

### **3.6 Follow Up Review Process**

This is the fifth Performance Audit and Asset Management Review conducted since the issue of the licence. There are no recommendations arising from this audit that require post audit action plans.

As detailed in section 5.1.8 of the Audit Guidelines (March 2019) recommendations for licence obligations, asset management processes or effectiveness criteria that received a rating other than those detailed in section 5.1.8 have been provided directly to the licensee.

### **3.7 Follow-Up from Previous Review Findings**

The organisation has implemented the recommendations of the previous review where possible and as required by Section 5.1.5 of the Audit Guidelines (March 2019). Table 12 below details how all recommendations were addressed and their status in the current review period.

**Table 12 Ineffective components recommendations, previous Review Implementation Plan**

<b>A Resolved before the end of the previous review period.</b>				
<b>Reference (no. /yr)</b>	<b>Process and policy deficiency / Performance deficiency</b> (Rating / Reference number, Asset management process & effectiveness criterion / Details of deficiency)	<b>Auditor's recommendation or action taken</b>	<b>Date resolved</b>	<b>Further action required (Yes/No/Not Applicable) Details of further action required (including current recommendation reference if applicable)</b>
None				

  

<b>B Resolved during the current review period.</b>				
<b>Reference (no. /yr)</b>	<b>Process and policy deficiency / Performance deficiency</b> (Rating / Reference number, Asset management process & effectiveness criterion / Details of deficiency)	<b>Auditor's recommendation or action taken</b>	<b>Date seen resolved / ref</b>	<b>Further action required (Yes/No/Not Applicable) &amp; Details of further action required (including current recommendation reference if applicable)</b>
	<b>B2. Likelihood and consequences of asset failure are predicted.</b> There was insufficient evidence to show that the Substation plant is subject to annual risk assessments including likelihood and consequences of asset failures.	Recommendation 4/2015 addresses the finding.	3/10/18 Vestas new contract	No
1/2015	<b>B2. 5.3 Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural</b> Whilst plant list, drawings, maintenance plans and condition details were documented and available, during the Review it was not possible to access the Balance of Plant asset register.	Ensure that the Balance of Plant asset register is available.	20/3/19 Fixed asset register EDWF.xls	No

2/2015	<b>B1. 7.1 Adequate system documentation for users and IT operators.</b> While most documents viewed did have sufficient document control there were some examples of appropriate document control missing both with Vestas and EDWF: ▶ EDWF Business & Asset Risk Register 2015 (EDWF document) ▶ EDWF Fire Ban Procedure Vestas document dated 23/07/15) ▶ Emu Down Wind Farm SRS (EDWF document in draft status) ▶ Linux Environment and Oracle Database SRD (EDWF document in draft status)	Ensure documents are adequately controlled with removal and finalisation of draft issues revision tracking and authorised approvals across Vestas and EDWF (APA Group).	10/12/2018	No
3/2015	<b>A1. 7.7 Data backup procedures appear adequate and backups are tested.</b> ▶ Compliance manual is out of date with respect to current timing of audit obligations – once every 36 months. ▶ Compliance manual is duplicated in parts with respect to actions required possibly making it more difficult to use as a regular compliance tool.	Review Compliance Manual for accuracy and practicality. Consolidate actions to improve ease of use.	10/5/19 3300-CMP-MAN-8000	No
4/2015	<b>B1. 8.2 Risks are documented in a risk register and treatment plans are actioned and monitored.</b> Asset related risks for substation plant fall outside of Vestas responsibility and are currently not covered by EDWF's risk management scope.	Include substation plant as part of the Business & Asset Risk Register review process.	3/10/18 Vestas new contract	No

### C. Unresolved at end of the current review period

Reference (no. /yr)	Process and policy deficiency / Performance deficiency (Rating / Reference number, Asset management process & effectiveness criterion / Details of deficiency)	Auditor's recommendation or action taken	Date seen resolved / ref	Further action required (Yes/No/Not Applicable) & Details of further action required
None				

### 3.8 Asset Management System Recommendations and Action Plans

As stipulated in section 5.3 of the Audit and Review Guidelines – Electricity and Gas Licences (March 2019), the Audit Team notes that the Asset Management Review Post Implementation Plan does not form part of the Audit Opinion. It is the responsibility of the licensee to ensure actions are undertaken as determined by Emu Downs Wind Farm Joint Venture.

### 3.9 2019 Review Asset System Deficiencies/Recommendations

**Table 13 Current Review Asset System Deficiencies / Recommendations**

Table of 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)	Process and policy deficiency / Performance deficiency (Rating / Reference number, Asset management process & effectiveness criterion / Details of deficiency)	Auditors' Recommendation	Action taken by the licensee by end of review period
None			



# **APPENDIX 1**

## **EMU DOWNS WIND FARM JOINT VENTURE**

### **PERFORMANCE AUDIT**

**AUGUST 2019**

**Table 14 Performance Audit**

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING RELATED DOCUMENTATION &/OR CONTROL SYSTEMS/AUDIT EVIDENCE → CORRECTIVE ACTION (CA) OPPORTUNITY FOR IMPROVEMENT	ADEQUACY OF CONTROLS	COMPLIANCE RATING
<b>SECTION 8: TYPE 1 REPORTING REQUIREMENTS</b>							
THERE ARE NO TYPE 1 REPORTING REQUIREMENTS APPLICABLE TO EGL1							
<b>SECTION 9: ELECTRICITY INDUSTRY CUSTOMER TRANSFER CODE - PART 3 - CUSTOMER/ CONNECTION INFORMATION/DATA</b>							
101	Generation Licence condition 5.3.1	Electricity Industry Act section 13(1)	A licensee must provide the Authority with a performance audit conducted by an independent expert acceptable to the Authority not less than once every 24 months.	5	<p>This is the fifth Audit conducted by an independent expert for the current licensee since the licence was granted in 23 June 2005. The requirement for the audit is monitored by the Risk &amp; Compliance Manager Power. Additionally it is raised in email communications and correspondence with the Secretariat. GES was appointed with the Authority's approval to undertake the performance audit for the audit period on the 27<sup>th</sup> May 2019 (Authority Document Ref: D202338).</p> <p>Previous Audit Period 1 July 2012 – 30 June 2015 Report was provided and published on the Authority's Website. Current Audit Period July 2015 – June</p>	A	1

					<p>2019 report to be provided to the Authority for publishing.</p> <p>The organisation has identified the requirement in the following documentation;</p> <ul style="list-style-type: none"> <li>▪ Compliance Manual - 330-MAN-CMP-8000_Rev 2</li> <li>▪ Management Committee Meeting Notes [e.g. May 2019]</li> <li>▪ EDWF Year Plan 2018-2019</li> <li>▪ Requirement identified in Business Risk Summary [EDWF Business Risk Summary 2016-2019]</li> <li>▪ Various communication between licensee and the Authority</li> <li>▪ Audit Plan developed and approved in accordance with Audit Guidelines</li> <li>▪ Discussion with Compliance &amp; Risk Manager</li> </ul> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents</li> </ul>		
102	Generation Licence condition 5.1.1	Electricity Industry Act section 14(1)(a)	A licensee must provide for an asset management system.	4	The licensee has provided for an asset management system and this has been verified during a site inspection of both EDWF and EDWF sites.	A	1

					<p>The organisation has recognised ongoing review and management of the asset management plans.</p> <p>The organisation has identified the requirement in the following documentation, system controls and processes;</p> <ul style="list-style-type: none"> <li>▪ Asset Management Plan</li> <li>▪ EDWF Year Plan (2016-2019)</li> <li>▪ Risk Management</li> <li>▪ Financial Model</li> <li>▪ Budget Approvals Process</li> <li>▪ Capital Expenditure Process</li> <li>▪ Performance Guarantees</li> <li>▪ Ongoing Operations and Maintenance Programmes (WTG's and Substation).</li> <li>▪ Replacement of faulty equipment</li> <li>▪ Technical Support</li> <li>▪ Service and Availability Agreement (SAA).</li> <li>▪ Plant Maintenance Strategies</li> <li>▪ Obtain maintenance data from O&amp;M</li> <li>▪ Contractor's SAP system</li> </ul> <p>The conclusion was determined via;</p>		
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					<ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents</li> </ul>		
103	Generation Licence condition 5.1.2 and 5.1.3	Electricity Industry Act section 14(1)(b)	A licensee must notify details of the asset management system and any substantial changes to it to the Authority.	4	<p>The addition of the solar wind farm occurred during the audit period. The Authority were notified of this change and the asset management system. The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents</li> <li>▪ Review of communication to the Authority [Dated 30 November 2017]</li> </ul>	A	1
104	Generation Licence condition 5.1.4	Electricity Industry Act section 14(1)(c)	A licensee must provide the Authority with a report by an independent expert about the effectiveness of its asset management system every 24 months or such longer period as determined by the Authority.	5	<p>This is the fifth Asset Management Review conducted by an independent expert for the current licensee since the licence was granted in 23 June 2005. The requirement for the audit is monitored by the Risk &amp; Compliance Manager Power. Additionally it is raised in email communications and correspondence with the Secretariat. GES was appointed with the Authority's approval to undertake the performance audit for the audit period on the 27<sup>th</sup> May 2019 (Authority Document Ref: D202338).</p>	A	1

					<p>Previous Audit Period 1 July 2012 – 30 June 2015 Report was provided and published on the Authority's Website. Current Audit Period July 2015 – June 2019 report to be provided to the Authority for publishing.</p> <p>The organisation has identified the requirement in the following documentation;</p> <ul style="list-style-type: none"> <li>▪ Compliance Manual - 330-MAN-CMP-8000_Rev 2</li> <li>▪ Management Committee Meeting Notes [e.g. May 2019]</li> <li>▪ EDWF Year Plan 2018-2019</li> <li>▪ Requirement identified in Business Risk Summary [EDWF Business Risk Summary 2016-2019]</li> <li>▪ Various communication between licensee and the Authority</li> <li>▪ Audit Plan developed and approved in accordance with Audit Guidelines</li> <li>▪ Discussion with Compliance &amp; Risk Manager</li> </ul> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents</li> </ul>		
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105	Generation Licence condition 4.2.1	Electricity Industry Act section 17(1)	A licensee must pay the prescribed licence fees to the Authority according to clauses 6, 7 and 8 of the Economic Regulation Authority (Licensing Funding) Regulations 2014.	4	<p>Licence fees were assessed during the audit period for the Annual Licence Charge and the Quarterly Standing Data Charges. In total there were 4 Annual fees due within the audit period. All but 1 was paid in accordance with the licence requirements and an interest payment charge was incurred. There were 15 quarterly Standing Data Charge Invoices received during the audit period. And 2 of these were not paid in accordance with the invoice terms of 30 days of receipt of the invoice.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents</li> <li>▪ Verification of payments with the Authority</li> </ul> <p><b>01/2019 – RECOMMENDATION</b>  <b>A review of the Compliance Manual [Ref 330-MAN-CMP-8000_Rev 2] highlights the payment of quarterly licence fees to the Authority (refer section 5.4) but does not clearly distinguish between the standing data charges and the Annual Licence fee. Noted that Section 5.5 does not refer</b></p>	B	2
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					<p><b>to annual payment of Licence Fees. As there have been instances during the audit period where requirements for licence fee payments have not been met, the Licensee is required to review processes to ensure annual licence payments are made by the 23rd July each year and quarterly Standing Data Charge invoices are paid within 30 days of issue. Updating the Compliance Manual to reference the payment of annual and quarterly licence fees and the associated Compliance Calendar (which is an automated reminder system) would ensure that this requirement is reflected clearly to ensure ongoing compliance.</b></p>		
106	Generation Licence condition 4.1.1	Electricity Industry Act section 31(3)	A licensee must take reasonable steps to minimise the extent or duration of any interruption suspension or restriction of the supply of electricity due to an accident emergency potential danger or other unavoidable cause.	5	<p>The Licensee has taken reasonable steps to minimise the extent or duration of any unavoidable interruption, suspension or restriction of electricity. In response the previous audit finding the risk assessment was reviewed and the Year Plans incorporate the substation and associated risks. These Year Plans have been updated throughout the audit period. Additionally, the Licensee has taken significant measures to ensure the</p>	A	1



					<p>plant performance both contractually and operationally.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents (including contractual documentation, operational and management records)</li> <li>▪ Verification of processes on site</li> <li>▪ Review of contractor operational systems</li> </ul>		
107	Generation Licence condition 4.1.1	Electricity Industry Act section 41(6)	A licensee must pay the costs of taking an interest in land or an easement over land.	4	<p>A long term lease exists over the property, which was valid and has been executed in compliance with the lease terms (including payment) during the audit period.</p> <p>Additional Lease boundaries exist to provide a buffer for surrounding Property owners and potential operational impacts.</p> <p>The organisation has identified the requirement in the following documentation;</p> <ul style="list-style-type: none"> <li>▪ Lease [19 July 2005]</li> </ul>	A	1

					<ul style="list-style-type: none"> <li>Farm Rules [EMU DOWNS WIND FARM–FARM RULES EDWF-190216-01]</li> </ul> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>Interview with supervisory &amp; operational personnel</li> <li>Desktop Review documents</li> <li>Site Visit and access to all areas of the wind and solar farms</li> </ul>		
<b>SECTION 12: ELECTRICITY LICENCES - LICENCE CONDITIONS AND OBLIGATIONS</b>							
119	Generation Licence condition 4.3.1	Electricity Industry Act section 11	A licensee and any related body corporate must maintain accounting records that comply with the Australian Accounting Standards Board Standards or equivalent International Accounting Standards.	4	<p>The EDWF financial reports have been prepared by third party accountants during the audit period. The Financial Reports contain statement of compliance that the statements have been prepared in accordance with all Australian Accounting Standards and Interpretations.</p> <p>All audits were completed by Deloitte, declarations of independence and compliance with Australian Accounting Standards were verified.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>Interview with supervisory &amp; operational personnel</li> <li>Desktop Review financial reports during the audit period</li> </ul>	A	1

121	Generation Licence condition 5.3.2	Electricity Industry Act section 11	A licensee must comply and require its auditor to comply with the Authority's standard audit guidelines for a performance audit.	4	<p>Direct instructions from Licensee to Auditor to comply with the Economic Regulation Authority's guidelines.</p> <p>Copies of communications received from the Authority relating to audit requirements sent by Licensee through to Auditor to convey requirements specifically the undertaking of audits in compliance with the Audit &amp; Review Guidelines: Electricity Gas and Water Licences.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents</li> <li>▪ Communication between the Authority and the Licensee</li> </ul>	A	1
122	Generation Licence condition 5.1.5	Electricity Industry Act section 11	A licensee must comply and must require the licensee's expert to comply with the relevant aspects of the Authority's standard audit guidelines for an asset management system review.	4	<p>Direct instructions from Licensee to Auditor to comply with the Economic Regulation Authority's guidelines.</p> <p>Copies of communications received from the Authority relating to audit requirements sent by Licensee through to Auditor to convey requirements specifically the undertaking of audits in</p>	A	1

					<p>compliance with the Audit &amp; Review Guidelines: Electricity                      Gas and Water Licences.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents</li> <li>▪ Communication between the Authority and the Licensee</li> </ul>		
123	Generation Licence condition 4.4.1	Electricity Industry Act section 1	In the manner prescribed a licensee must notify the Authority, if it is under external administration or if there is a significant change in the circumstances that the licence was granted which may affect the licensee's ability to meet its obligations.	4	<p>Under Licence clause 15.1 the licensee is required to report relevant information to the Authority in the event that it:</p> <p>(a) Is under external administration                      (b) Experiences a change in its corporate financial or technical circumstances upon which this license was granted; and that change may materially affect the licensee's ability to perform its obligations under this license                      (c) Changes its name, ABN or address.</p> <p>Confirmed that for the period 1 July 2015 to 30 June 2019 no such changes arose.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> </ul>	A	NR

					<ul style="list-style-type: none"> <li>Review documents including Year Plans, Budgets, Financial Reports and Management Minutes</li> </ul>		
124	Generation Licence condition 4.5.1	Electricity Industry Act section 11	A licensee must provide the Authority in the manner prescribed with any information that the Authority requires in connection with its functions under the Electricity Industry Act.	1	<p>During the Audit Period the Licensee has provided the Authority information it required in connection with its functions under the Electricity Industry Act.</p> <p>All licensees are required to submit a compliance report to the Authority covering all of its type 1 and type 2 licence obligations for each financial year (1 July to 30 June inclusive) by 31 August immediately following the year that is the subject of the report. Compliance with submission of the report is confirmed during the audit period the reports were submitted on the following dates;</p> <ul style="list-style-type: none"> <li>2015 - 2016 Report – 2<sup>nd</sup> August 2016</li> <li>2016 - 2017 Report – 22<sup>nd</sup> August 2017</li> <li>2017 - 2018 Report - 11 July 2018</li> </ul> <p>Compliance was noted during all the reports, however, during the audit review of compliance, it is noted that the Compliance Report (due 31 August</p>	B	2

					<p>2016) did not reflect the late payment of the Standing Data Charge for the quarter commencing July 2015 should have been reflected in the Compliance Report for 2015-2016 Year.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Review of compliance reports</li> <li>▪ Desktop Review documents</li> </ul> <p><b>20/2019 – RECOMMENDATION</b></p> <p><b>The Licensee is required to ensure that non-compliances are reported in a Compliance Report which is to be submitted by the 31<sup>st</sup> August annually. The 2015-2016 Compliance Report prepared during the audit period did not report a non-compliance in reference to late payment of the licence fee for the 2015 Standing Data Charges for the July quarter. It is noted that during the audit period, the responsibility for monitoring Compliance is managed by an APA representative and the reporting function of the compliance Report was the responsibility of the Operations</b></p>		
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					<b>Manager. A process to ensure compliance requirements have been met and documented liaison relating to the legislative requirements and content of the Compliance Report prior to submission to the Authority is required. This would ensure all non-compliances are clearly identified and reported.</b>		
125	Generation Licence condition 3.8.1 and 3.8.2	Electricity Industry Act section 11	A licensee must publish any information it is directed by the Authority to publish within the timeframes specified.	4	<p>According the Licensee's Generation Licence EGL1; the term "publish" in relation to a report or information means either: (a) posting the report or information on the licensee's website; or (b) sending the report or information to the Authority to be published on the Economic Regulation Authority's website.</p> <p>The Licensee has submitted the previous Performance Audit and Asset Management System Review. This was published on the Economic Regulation Authority's Website on the 15/11/2015 and a notice published on the 1/12/15 advising the outcome and subsequent audit period.</p>	A	NR

					<p>There have been no other requests by the Authority to publish information during the audit period.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Review of Economic Regulation Authority's website</li> <li>▪ Desktop Review documents</li> </ul>		
126	Generation Licence condition 3.7.1	Electricity Industry Act section 11	Unless otherwise specified all notices must be in writing.	4	<p>During the audit period the Licensee maintained records of communication with the Authority, primarily via mail or email communication. All responses have been in writing and specific notices in relation to the Generation Licence have been reviewed as part of the audit.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents</li> <li>▪ Review of communication electronic and hardcopy</li> <li>▪ Verification of processes on site</li> </ul>	A	1
<b>SECTION 14: ELECTRICITY INDUSTRY METERING CODE - LICENCE CONDITIONS AND OBLIGATIONS</b>							
324	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 3.3B	If a user is aware of bi-directional electricity flows at a metering point that was not previously subject to a bi-directional flows or	4	There has been no change with respect to bi-directional flows during the audit period. The Licensee continues to import	NP	NR



			any changes in a customer's or user's circumstances in a metering point that will result in bi-directional flows the user must notify the network operator within 2 business days.		power from Synergy as required. Normal operating conditions requires this only occurs when the plant is not generating sufficient electricity for site consumption.		
339	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 3.11(3)	A Code participant who becomes aware of an outage or malfunction of a metering installation must advise the network operator as soon as practicable.	4	<p>WPN has primary responsibility for the management and monitoring of meters. There were no outages or malfunctions identified during the audit period. Production staff monitor usage through production calculations and can generally identify an error.</p> <p>Review of communication with WPN.</p> <p>Emu Downs Wind Farm Joint Venture Personnel interviewed</p> <ul style="list-style-type: none"> <li>▪ Operations Manager</li> <li>▪ Asset Manager Renewables and Transmission - Power Division</li> <li>▪ Vestas - EDWF Site Supervisor</li> </ul> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel (including contractors)</li> <li>▪ Desktop Review documents</li> <li>▪ Verification of processes and systems on site</li> </ul>	A	NR

364	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 3.27	A person must not install a metering installation on a network unless the person is the network operator or a registered metering installation provider for the network operator doing the type of work authorised by its registration.	4	<p>The Licensee is not responsible for installing and managing all metering installations on the site. Additionally, the Licensee has not installed any metering installations on the network. The Network Operator has independent access to metering installations.</p> <p>Discussions with the Operations Manager also confirmed no installation of meters. As such, no activity has taken place to exercise the obligation during the audit period and its requirement cannot be assessed.</p>	NP	NR
371	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 4.4(1)	If there is a discrepancy between energy data held in a metering installation and in the metering database the affected Code participants and the network operator must liaise to determine the most appropriate way to resolve the discrepancy.	5	<p>There have been no discrepancies between energy data held in metering installation and in the metering database. As such compliance with this requirement cannot be made. Discussions with the Operations Manager.</p> <p>The conclusion was determined via;</p> <ul style="list-style-type: none"> <li>▪ Interview with supervisory &amp; operational personnel</li> <li>▪ Desktop Review documents</li> </ul> <p>Note: The above audit procedures are applicable for Ref 371-461</p>	NP	NR

372	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 4.5(1)	A Code participant must not knowingly permit the registry to be materially inaccurate.	5	Emu Downs Wind Farm Joint Venture does not maintain any standing data or energy data in relation to the metering installations captured under the Metering Code. These activities are managed by the Network Operator and are outside the control of the Licensee. As the Network operator maintains sole responsibility for the management of standing data within the registry and/or metering database these obligations are not relevant to the Licensee's operations for the period 1 July 2015 to 30 June 2019.	NP	NR
373	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 4.5(2)	If a Code participant (other than a network operator) becomes aware of a change to or an inaccuracy in an item of standing data in the registry then it must notify the network operator and provide details of the change or inaccuracy within the timeframes prescribed.	4	As above.	NP	NR
388	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 5.4(2)	A user must when reasonably requested by a network operator use reasonable endeavours to assist the network operator to comply with the network operator's obligation.	5	<p>The network operator has not requested the assistance of Emu Downs Wind Farm Joint Venture with respect to their metering installation during the audit period.</p> <p>Note: The Licensee has no meters and Western Power owns the meters at EDWF Terminal substation and is responsible for their quality control.</p>	NP	NR

402	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 5.17(1)	A user must provide standing data and validated (and where necessary substituted or estimated) energy data to the user's customer to which that information relates where the user is required by an enactment or an agreement to do so for billing purposes or for the purpose of providing metering services to the customer.	4	There are no meters maintained by the Licensee to collect information or data from billing. The Network Operator is responsible for metering installations.	NP	NR
406	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 5.19(1)	A user must when requested by the network operator acting in accordance with good electricity industry practice use reasonable endeavours to collect information from customers if any that assists the network operator in meeting its obligations described in the Code and elsewhere.	5	There have been no requests to any user to collect information during the audit period. Therefore, this obligation has not been rated.	NP	NR
410	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 5.19(6)	A user must use reasonable endeavours to ensure that it does not notify the network operator of a change in an attribute that results from the provision of standing data by the network operator to the user.	5	During the audit period there has been no provision of standing data by the network operator to the user that resulted in the user notifying the network operator of a change in attributes.	NP	NR
416	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 5.21(5)	A Code participant must not request a test or audit unless the Code participant is a user and the test or audit relates to a time or times at which the user was the current user or the Code participant is the IMO.	4	No tests have been requested during the audit period 1 July 2015 to 30 June 2019.	NP	NR
417	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 5.21(6)	A Code participant must not make a test or audit request that is inconsistent with any access arrangement or agreement.	4	As above.	NP	NR

435	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 5.27	Upon request a current user must provide the network operator with customer attribute information that it reasonably believes are missing or incorrect within the timeframes prescribed.	4	The network operator did not make any requests for customer attributes information during the audit period.	NP	NR
448	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 6.1(2)	A user must in relation to a network on which it has an access contract comply with the rules procedures agreements and criteria prescribed.	4	There have been no breaches of the rules, procedures, agreements and criteria during the audit period.	NP	1
451	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 7.2(1)	Code participants must use reasonable endeavours to ensure that they can send and receive a notice by post, facsimile, and electronic communication and must notify the network operator of a telephone number for voice communication in connection with the Code.	5	The EDWF site has well established communication processes such as a main telephone line & facsimile, mobile telephone coverage, remote system monitoring, and wireless internet access. During the audit period there have been no communication issues arising.	A	1
453	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 7.2(4)	A Code participant must notify its contact details to a network operator with whom it has entered into an access contract within 3 business days after the network operator's request.	4	During the period 1 July 2015 to 30 June 2019 the network operator did not request the licensee to provide its contact details. There have been no changes made to Licensee's contact details.	NP	NR
454	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 7.2(5)	A Code participant must notify any affected network operator of any change to the contact details it notified to the network operator at least 3 business days before the change takes effect.	4	There have been no changes in contact details for the Licensee during the audit period.	NP	NR
455	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 7.5	A Code participant must not disclose or permit the disclosure of confidential information provided to it under or in	4	During the period 1 July 2015 to 30 June 2019 the Licensee was not required to disclose or permit the disclosure of	NP	NR

			connection with the Code and may only use or reproduce confidential information for the purpose for which it was disclosed or another purpose contemplated by the Code.		confidential information in connection to the Code.		
456	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 7.6(1)	A Code participant must disclose or permit the disclosure of confidential information that is required to be disclosed by the Code.	4	As above	NP	NR
457	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 8.1(1)	Representatives of disputing parties must meet within 5 business days after a notice given by a disputing party to the other disputing parties and attempt to resolve the dispute under or in connection with the Electricity Industry Metering Code by negotiations in good faith.	5	There have been no disputes arising during the audit period.	NP	NR
458	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 8.1(2)	If a dispute is not resolved within 10 business days after the dispute is referred to representative negotiations the disputing parties must refer the dispute to a senior management officer of each disputing party who must meet and attempt to resolve the dispute by negotiations in good faith.	5	As above	NP	NR
459	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 8.1(3)	If the dispute is not resolved within 10 business days after the dispute is referred to senior management negotiations the disputing parties must refer the dispute to the senior executive officer of each disputing party who must meet and attempt to resolve the dispute by negotiations in good faith.	5	As above	NP	NR

460	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 8.1(4)	If the dispute is resolved by representative negotiations, senior management negotiations, or CEO negotiations the disputing parties must prepare a written and signed record of the resolution and adhere to the resolution.	4	As above	NP	NR
461	Generation Licence condition 4.1.1	Electricity Industry Metering Code clause 8.3(2)	The disputing parties must at all times conduct themselves in a manner which is directed towards achieving the objective of dispute resolution with as little formality and technicality and with as much expedition as the requirements of Part 8 of the Code and a proper hearing and determination of the dispute permit.	5	As above	NP	NR
<b>SECTION 16: ELECTRICITY LICENCES - LICENSEE SPECIFIC CONDITIONS AND OBLIGATIONS</b>							
THIS SECTION IS NOT APPLICABLE TO EMU DOWNS WIND FARM JOINT VENTURE AS THERE HAVE BEEN NO SPECIFIC CONDITIONS AND OBLIGATIONS ATTACHED TO THE GENERATION LICENCE							

NOTE NP - not possible to provide a compliance rating because no activity has taken place to exercise the obligation during the audit period  
 NA - Not applicable to audit period and as such not assessed

## **APPENDIX 2**

### **EMU DOWNS WIND FARM JOINT VENTURE**

#### **ASSET MANAGEMENT REVIEW**

**AUGUST 2019**



## Introduction

Emu Downs Wind Farm Joint Venture operates under the first generation licence issued, EGL1, and has proven a reliable well run facility. The original equipment manufacturer, OEM, has been contracted operator of the windfarm since inception and utilises access to worldwide experience with similar wind turbine generators, WTG. The windfarm is now in mid-life and operational experience and good operation and maintenance has enabled the operator to agree to a higher contracted availability than previously.

The solar farm has just come out of the defects liability period and the constructor also currently has the operation contract.

The Emu Downs Wind Farm Joint Venture is only a small part of APA's portfolio and financial risks of the facility are small compared with, for example, some of their gas pipelines but risk assessments also give consideration to reputation and other aspects of the operations.

Operations are well managed with condition monitoring, planning and managing the O&M to meet stakeholders' needs.

Safety LTI, environmental and community issues have all been zero throughout the reporting period, quality of supply non-compliances (minor flicker and voltage) have not been attributable to the facility.

WTG production and availability have been marginally below budget (2.15% and 1.17% respectively average of annual availabilities over the period). Solar production has also been below budget due to teething troubles and curtailment for other reasons.

Processes within for the solar farm are being refined with APA collaborating with the contractors. The integration of the solar farm into the windfarm's SAP program is beneficial to the process.

No penalties have been applied for availability or capacity to either of the contractors under the O&M contracts during the reporting period.

**Table 15 Effectiveness Criteria Descriptors**

1	<b>Key Process - Asset Planning</b> Asset planning strategies focuses on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).	<b>Outcome</b> Asset planning is integrated into operational or business plans, providing a framework for existing and new assets to be effectively utilised and their service optimised.
1.1	Asset management plan covers the processes in this table	
1.2	Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning	
1.3	Service levels are defined in the asset management plan	
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	Asset management plan is regularly reviewed and updated	
2	<b>Key Process - Asset creation and acquisition</b> Asset creation/acquisition is the provision or improvement of assets.	<b>Outcome</b> The asset acquisition framework is economic efficient and cost-effective; it reduces demand for new assets, lowers service costs and improves 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	<b>Key process - Asset disposal</b> Asset disposal is the consideration of alternatives for the disposal of surplus Obsolete, under-performing or unserviceable assets.	<b>Outcome</b> The asset management framework minimises holdings of surplus and underperforming assets and lowers service costs. The cost-benefits of disposal options are evaluated.
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	<b>Key Process - Environmental analysis</b> Environmental analysis examines the asset management system environment	<b>Outcome</b> The asset management system regularly assesses external opportunities and threats

	and assesses all external factors affecting the asset management system.	and identifies corrective action to maintain performance requirements.
4.1	Opportunities and threats in the asset management 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	Service standard (customer service levels etc) are measured and achieved	
5	<b>Key Process - Asset operations</b> Asset operations is the day-to- day running of assets (where the asset is used for its intended purpose).	<b>Outcome</b> The asset operation plans adequately document the processes and knowledge of staff in the operation of assets so 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 and an assessment of assets' physical/structural condition	
5.4	Accounting data is documented for assets	
5.5	Operational costs are measured and monitored	
5.6	Staff resources are adequate and staff receive training commensurate with their responsibilities	
6	<b>Key process - Asset maintenance</b> Asset maintenance is the upkeep of assets.	<b>Outcome</b> The asset maintenance plans cover the scheduling and resourcing of the maintenance tasks so 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	<b>Key process - Asset Management Information System (MIS)</b> An asset management information system is a combination of processes, data and software supporting the asset management functions	<b>Outcome</b> The asset management information system provides authorized, complete and accurate information for the day-to-day 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 suitable verification and validation of data entered into the system	
7.3	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	Computations for licensee performance reporting are accurate	
7.7	Management reports appear adequate for the licensee to monitor licence obligations	
7.8	Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	
8	<b>Key Process - Risk Management</b> Risk management involves the identification of risks and their management within an acceptable level of risk.	<b>Outcome</b> The risk management framework effectively manages the risk that the licensee does not maintain effective service standards
8.1	Risk management policies and procedures exist and are applied to minimise internal and external risks	
8.2	Risks are documented in a risk register and treatment plans are implemented and monitored	
8.3	Probability and consequences of asset failure are regularly assessed	
9	<b>Key Process - Contingency Planning</b> Contingency plans document the steps to deal with the unexpected failure of an asset	<b>Outcome-</b> Contingency plans have been developed and tested to minimise any major disruptions to service standards.
9.1	Contingency plans are documented understood and tested to confirm their operability and to cover higher risks	
10	<b>Key Process - Financial Planning</b> Financial brings together the financial elements of the service delivery to ensure its financial viability over the long term.	<b>Outcome</b> The financial plan is reliable and provides for the long- term financial viability of the services.
10.1	The financial plan states the financial objectives and identifies strategies and actions to achieve those	
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 provides firm predictions on income for the next five years and reasonable 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	Large variances in actual/budget income and expenses are identified and corrective action taken where necessary	

11	<b>Key Process - Capital Expenditure Planning</b> The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure for these works over the next five or more years. Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years preferably longer. Projections over the next five years would usually be based on firm estimates.	<b>Outcome -</b> The capital expenditure plan provides reliable forward estimates of capital expenditure and asset disposal income. Reasons for the decisions and for the evaluation of alternatives and options are documented.
11.1	There is a capital expenditure plan covering works to be undertaken actions proposed responsibilities and dates	
11.2	The capital expenditure plan provides 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 the capital expenditure plan is regularly updated and implemented	
12	<b>Key Process - Review of AMS</b> The asset management system is regularly reviewed and updated.	<b>Outcome</b> The asset management system is regularly reviewed and updated.
12.1	A review process is in place to ensure the asset management plan and the asset management system described in it remain current	
12.2	Independent reviews (e.g. internal audit) are performed of the asset management system	

**Table 16 Audit Review Ratings and Recommendations**

1.	<b>Key Process - Asset Planning</b> Asset planning strategies focuses on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).  <b>Outcome</b> Asset planning is integrated into operational or business plans, providing a framework for existing and new assets to be effectively utilised and their service optimised.	<b>Asset management process and policy definition adequacy rating</b>  <b>A</b>	<b>Asset management performance rating</b>  <b>1</b>
<b>Interviewees:</b> APA Paul McLagan    Operations Manager - Power Division  APA Stuart Dodds    Asset Manager Renewables and Transmission - Power Division APA Glen Thomsen    Commercial Manager - Power Division  APA Naomi Donohue    Market & Regulatory Specialist - Power Division		<b>Relevant documentation:</b> 2      330-MAN-CMP-8000 - EDRF BRF Wind and Solar Farm Compliance Manual.pdf 3      Superseded 33160101R0 Compliance Monitoring Program.pdf 4      33170101R1 EDWF Year Plan 2017-2018.pdf 5      33180101R1 EDWF Year Plan 2018-2019.pdf 6      33190101R EDWF Year Plan 2019-2020 Rev 1.pdf 7      33180104R0 - CMP Report.pdf 9      EDRF 33180103R3 - Risk Management - Rev 3.pdf 10     EDRF 33190101S - Sapphire License.pdf 11     EDRF Document Register - 2019.pdf 12     EDRF Risk Guide 2018.pdf 13     EDRF Risk Summary 2019.pdf 14     EDWF - 190216-01 - Farm Rules Rev 1.pdf 15     EDWF - 280116-01 - OH&S Policy.pdf 16     EDWF - 280116-02 - Environmental Policy.pdf 17     EDWF 33170103R1 - Project Procedure.pdf 18     EDWF 33180101R4 - AMS Rev 4.pdf 19     EDWF O&M Report - July 2015 to June 2016.pdf	

	20	EDWF O&M Report - July 2016 to June 2017.pdf
	21	EDRF O&M Report - July 2017 to June 2018.pdf
	22	EDRF OM Report - July 2018 to June 2019.pdf
	23	EDWF Operating Protocol V2 Final_signed.pdf
	24	EDWF Risk Register 2016.pdf
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	26	EDWF Risk Register 2018.pdf
	27	EDWF Risk Register 2019.pdf
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	29	EDWF Risk Summary 2017.pdf
	30	EDWF Risk Summary 2018.pdf
	31	EDWF Year Plan 2015-2016 Rev 1.pdf
	32	EDWF Year Plan 2016-2017 Rev 0.pdf
	34	2. FY2016 APT Audit Report.pdf
	35	2. FY2016 APTIT Audit Report.pdf
	36	2. FY2017 APT Audit Report.pdf
	37	2. FY2017 APTIT Audit Report.pdf
	38	2. FY2018 APTIT Auditor Report.pdf
	39	2. HY2019 APT Audit Report.pdf
	40	2. HY2019 APTIT Audit Report.pdf
	46	3.3 Revenue Projections - EDWF.xlsx
	47	4. Funding - EDWF - Need to review.pdf
	48	6. FY19 Capex Plan - EDWF.pdf
	49	6. FY20 Capex Plan - EDSF.pdf
	50	6. FY20 Capex Plan - EDWF.pdf
	51	7. Capex Act v Bud FY19.xlsx
	53	8. Capex Review Process.pdf
	54	9. O&M Cost Drive - EDSF.pdf
	55	9. O&M Cost Drive - EDWF.pdf

56	12. Fix Asset Register - EDSF.xlsx
57	12. Fix Asset Register- EDWF.xlsx
71	EDWF System Recovery Document 2019.pdf
72	EDWFS _ Business Impact Analysis 2018.pdf
73	EDWFS System Recovery Sheet 2019.pdf
75	IT Backup Standard v1.2.pdf
81	EDRF Compliance Register 17-18.pdf
82	EDWF - 20816-01 - Economic Regulation Authority Compliance Report July 2015 to June 2016.pdf
83	EDWF - 110718-01 - Economic Regulation Authority Compliance Report July 2017 to June 2018.pdf
84	EDWF - 220817-01 - Economic Regulation Authority Compliance Report July 2016 to June 2017.pdf
92	Asset%20Management%20Plan_Emu%20Downs%20-%2009112017.pdf
94	0544 EDSF OM Monthly Meeting Minutes_20190613_.pdf
95	EDWF Substation Scheduled Maintenance Rev 3 - 12-3-19.pdf
96	EDWF Substation Spares 12-03-19.xls
97	EDRF Schedule Maintenance.xls
100	APA.WA.CA.699_Emu Downs OM_Executed_Word Searchable.pdf
103	EDWF - 031117-01 - WTG Availability.pdf
105	EDWF - 131016-01 - WTG Availability.pdf
106	EDWF - 041115-01 - WTG Availability.pdf
107	WHSP\Addendum 4 - EDWF Risk Register and Control Matrix.doc
108	WHSP\Addendum 4 - Site Risk Register.pdf
109	WHSP\Addendum 6 - Environmental Aspects and Control Mechansims.pdf



	110	WHSP\Addendum 6 - EDWF Environmental Aspects and Control Mechansims.docx
	111	WHSP\Addendum 7 - Safety Environmental Check Form.pdf
	112	WHSP\Addendum 11 - EDWF ERP Rev F.DOC
	113	WHSP\Addendum 11 - Emergency Response Plan.pdf
	114	WHSP\Addendum 12 - Health and Safety Incident Reporting Requirements.pdf
	116	WHSP\Noise_measurement_summary_NM82-1650_2004-01-19.pdf
	118	WHSP\Vestas ASP Standard - Fitness for Work.pdf
	119	WHSP\Vestas_Drug%20%20Alcohol-Free%20Workplace%20Policy%20R.1.pdf
	120	0000-2968.pdf
	121	0000-9776.pdf
	122	0003-9663.pdf
	123	20190731114817535.pdf
	124	Asset Criticality C ED CR M W S E.xlsx
	126	06 UGL Contract #126-144
	146	EDRF - 260718-01 - Maintenance Schedule.pdf
	147	EDRF - Operating Agreement - Contacts.pdf
	148	EDWF - 090816-01 - Maintenance Schedule.pdf
	149	EDWF - 220817-02 - Maintenance Schedule.pdf
	150	EDWF - 240915-01 - Maintenance Schedule.pdf
	151	EDWF Operating Protocol V2 Final_signed.pdf
	152	Emu Downs Deed of Variation - WP Execution Page.pdf
	153	Emu Downs Deed of Variation & Restated Connection Agreement.pdf
	154	Network Access Agreement Conformed Copy.pdf
	156	MCM monthly meetings notes # 158-201
	172	2017\01 EDWF MCM Notes - January 2017.pdf
	173	2017\02 EDWF MCM Notes - February 2017.pdf

174	2017\03 EDWF MCM Notes - March 2017.pdf
175	2017\04 EDWF MCM Notes - April 2017.pdf
176	2017\05 EDWF MCM Notes - May 2017.pdf
177	2017\06 EDWF MCM Notes - June 2017.pdf
178	2017\07 EDWF MCM Notes - July 2017.pdf
179	2017\08 EDWF MCM Notes - August 2017.pdf
180	2017\09 EDWF MCM Notes - September 2017.pdf
181	2017\10 EDWF MCM Notes - October 2017.pdf
182	2017\11 EDWF MCM Notes - November 2017.pdf
183	2017\12 EDWF MCM Notes - December 2017.pdf
202	EDWF O and M Notes #204-249
249	EDSF O and M Notes #250-265
265	Vestas Emu Downs Wind Farm Emergency Response Plan
267	EDRF 33180104S - SVC Air-con.pdf
270	EDWF-E-5213-4 Rev 04.pdf
271	Risk Assessment - SVC Air-con.pdf
272	SVC DRAFT Arc Flash Safety RA 20th May 2019.pdf
273	500-PR-0004.pdf
274	500-PR-0005.pdf
275	ARENA LSS Project Plan EDSF 15 June 2016.pdf
277	Emu Downs Wind Farm - AMP.docx
278	Operation and Maintenance Plan - EMU DOWNS 2019.pdf"
280	3200-0544 Emu Downs - Emergency Response Plan Rev B.pdf"
281	3200-0544 Emu Downs Project Safety Management Plan Rev 0A.pdf"
282	3200-0544-PLN-003_R1 - Project Quality Plan.pdf"
284	Avail Calc Summary 2019.pdf"
285	EDSF O&M HSSE Risk Register R0A - EIMS-7-5448 - Section 2 BR.pdf
286	EDSF-MAN-OM-0001_1_AB.pdf"

	287	Emu Downs - Operating Protocol - Rev 0.pdf
	286	EDSF-MAN-OM-0001_1_AB.pdf"
	287	Emu Downs - Operating Protocol - Rev 0.pdf

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy rating	Performance Rating
1.1 Asset management plan covers the processes in this table	2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15, 16, 17, 18, 31, 32, 34, 48, 49, 50, 56, 57, 71, 72, 73, 75, 82, 83, 84, 92, 95, 96, 103, 105, 106, 107, 108, 109, 111, 112, 113, 114, 118, 119, 126, 151, 153, 154, 156, 202, 265, 277, 278, 280, 281, 282, 285, 286, 287	The AMPs (APA's and Vestas) and UGL O&M Manual, together with procedures in place cover the processes in this table.	A	1
1.2 Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning	4, 5, 6, 10, 14, 18, 31, 32, 34, 35, 36, 37, 38, 47, 48, 49, 50, 51, 53, 92, 100, 126, 146, 148, 149, 150, 151, 152, 156, 202, 273, 274, 275, 277, 278, 284, 287	The main asset addition, the solar farm, was planned prior to this audit period. Implementation and Arena funding application were during the reporting period and followed well defined procedures addressing stakeholder's needs. Other smaller additions were seen to reflect stakeholder's requirements and followed established processes.	A	1
1.3 Service levels are defined in the asset management plan.	2, 3, 4, 5, 6, 7, 18, 19, 20, 21, 22, 23, 31, 32, 81, 82, 83, 84, 92, 103, 105, 106, 116, 126, 147, 148, 149, 150, 151, 153, 154, 249, 275, 277, 284, 286	Service levels are stated in the AMS, policies and procedures and form part of the performance parameters in the O&M Contracts for the wind and solar farms.	A	1
1.4 Non-asset options (e.g. demand management) are considered		Demand management is not applicable to generators paid on energy dispatched.	Not Assessed	

1.5 Lifecycle costs of owning and operating assets are assessed	2, 10, 17, 18, 19, 20, 21, 22, 46, 273, 274, 275	Life cycle costing were employed for the original development and for the solar farm and are maintained. Both wind and solar farms have proved profitable.	A	1
1.6 Funding options are evaluated	17, 18, 31, 32, 48, 49, 50, 51, 53, 275	Funding is through APA's overall portfolio of which Emu Downs Wind Farm Joint Venture is only a minor portion. Emu Downs Wind Farm Joint Venture funding applications have to be approved by the parent company. Central funding is regularly reviewed.	A	1
1.7 Costs are justified and cost drivers identified	17, 18, 54, 55, 56, 57, 267, 270, 271, 272, 275	Procedures require several tenders for large projects (initially 6 for EDSF). All funding is by APA and has to be justified and approved.	A	1
1.8 Likelihood and consequences of asset failure are predicted	2, 9, 12, 13, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 71, 72, 73, 75, 92, 94, 95, 96, 97, 108, 109, 110, 111, 112, 113, 114, 120, 121, 122, 123, 124, 267, 271, 272, 275, 277	Risk registers are maintained at overall and project level and contingency plans are considered in planning. The Vestas SAP database reports on the performance of similar WTG around the world and improvements implemented if justified. Additional critical spares such as HV motors requested and budgeted for.	A	1
1.9 Asset management plan is regularly reviewed and updated	2, 3, 4, 5, 6, 7, 11, 18, 19, 20, 21, 22, 31, 32, 34, 35, 36, 37, 38, 39, 40, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 277	The AMS was revised twice during the reporting period and now incorporates the solar farm. Some documents referred to in the AMP are out of date but the revision process to incorporate EDSF and EDWF is in progress Vestas AMP was issued in 2017 and revised in 2018.	A	2

Comments & Recommendations

2.	<b>Key Process - Asset creation and acquisition</b> Asset creation/acquisition is the provision or improvement of assets. <b>Outcome</b> The asset acquisition framework is economic efficient and cost-effective; it reduces demand for new assets lowers service costs and improves service delivery.	<b>Asset management process and policy definition adequacy rating</b>  <b>A</b>	<b>Asset management performance rating</b>  <b>1</b>
<b>Interviewees:</b> APA Paul McLagan    Operations Manager - Power Division  APA Stuart Dodds    Asset Manager Renewables and Transmission - Power Division APA Glen Thomsen    Commercial Manager - Power Division  APA Naomi Donohue    Market & Regulatory Specialist - Power Division		<b>Relevant documentation:</b> 2      330-MAN-CMP-8000 - EDRF BRF Wind and Solar Farm Compliance Manual.pdf 3      Superseded 33160101R0 Compliance Monitoring Program.pdf 4      33170101R1 EDWF Year Plan 2017-2018.pdf 5      33180101R1 EDWF Year Plan 2018-2019.pdf 6      33190101R EDWF Year Plan 2019-2020 Rev 1.pdf 7      33180104R0 - CMP Report.pdf 10     EDRF 33190101S - Sapphire License.pdf 15     EDWF - 280116-01 - OH&S Policy.pdf 16     EDWF - 280116-02 - Environmental Policy.pdf 17     EDWF 33170103R1 - Project Procedure.pdf 18     EDWF 33180101R4 - AMS Rev 4.pdf 19     EDWF O&M Report - July 2015 to June 2016.pdf 20     EDWF O&M Report - July 2016 to June 2017.pdf 21     EDRF O&M Report - July 2017 to June 2018.pdf 22     EDRF OM Report - July 2018 to June 2019.pdf 31     EDWF Year Plan 2015-2016 Rev 1.pdf 32     EDWF Year Plan 2016-2017 Rev 0.pdf 34     2. FY2016 APT Audit Report.pdf 35     2. FY2016 APTIT Audit Report.pdf	

36	2. FY2017 APT Audit Report.pdf
37	2. FY2017 APTIT Audit Report.pdf
38	2. FY2018 APTIT Auditor Report.pdf
39	2. HY2019 APT Audit Report.pdf
40	2. HY2019 APTIT Audit Report.pdf
56	12. Fix Asset Register - EDSF.xlsx
57	12. Fix Asset Register- EDWF.xlsx
92	Asset%20Management%20Plan_Emu%20Downs%20-%2009112017.pdf
93	Vestas SAP database
107	WHSP\Addendum 4 - EDWF Risk Register and Control Matrix.doc
108	WHSP\Addendum 4 - Site Risk Register.pdf
109	WHSP\Addendum 6 - Environmental Aspects and Control Mechansims.pdf
110	WHSP\Addendum 6 - EDWF Environmental Aspects and Control Mechansims.docx
111	WHSP\Addendum 7 - Safety Environmental Check Form.pdf
112	WHSP\Addendum 11 - EDWF ERP Rev F.DOC
113	WHSP\Addendum 11 - Emergency Response Plan.pdf
114	WHSP\Addendum 12 - Health and Safety Incident Reporting Requirements.pdf
115	WHSP\EDWF WHSEMP - SC016666.pdf
116	WHSP\Noise_measurement_summary_NM82-1650_2004-01-19.pdf
117	WHSP\COHSM 0055-5622.pdf
118	WHSP\Vestas ASP Standard - Fitness for Work.pdf
119	WHSP\Vestas_Drug%20%20Alcohol-Free%20Workplace%20Policy%20R.1.pdf
131	EDSF O&M Contract - Schedule 3 Scope of Services.pdf

	135	EDSF O&M Contract - Schedule 7 Government Approvals.pdf
	136	EDSF O&M Contract - Schedule 8 Document Submission Schedule.pdf
	140	EDSF O&M Contract - Schedule 14 Reports.pdf
	142	EDSF O&M Contract - Schedule 16 WHSE Requirements.pdf
	143	EDSF O&M Contract - Schedule 17 Cultural Heritage Management Plan.pdf
	144	EDSF O&M Contract - Schedule 18 ARENA Requirements.pdf
	156	MCM monthly meetings notes # 158-201
	202	EDWF O and M Notes #204-249
	249	EDSF O and M Notes #250-265
	268	EDWF-E-5212 Rev 03.pdf
	272	SVC DRAFT Arc Flash Safety RA 20th May 2019.pdf
	273	500-PR-0004.pdf
	274	500-PR-0005.pdf
	275	ARENA LSS Project Plan EDSF 15 June 2016.pdf
	276	EDWF commissioning reports
	277	Emu Downs Wind Farm - AMP.docx
	278	Operation and Maintenance Plan - EMU DOWNS 2019.pdf"
	286	EDSF-MAN-OM-0001_1_AB.pdf"
	287	Emu Downs - Operating Protocol - Rev 0.pdf



Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy rating	Performance Rating
2.1 Full project evaluations are undertaken for new assets, including comparative assessment of non-asset options	10, 17, 18, 56, 57, 92, 268, 272, 273, 274, 277, 278	Prior to this reporting period the solar farm was evaluated and then put on hold due to political uncertainty. With Arena funding APA's hurdle rate was met and the project implemented during the reporting period. Vesta's performance modifications are justified and approved.	A	1
2.2 Evaluations include all life-cycle costs	2, 18, 273, 274, 275	A detailed life-cycle cost model is maintained and used as part of the asset acquisition process and the maintenance management process.	A	1
2.3 Projects reflect sound engineering and business decisions	10, 18, 93, 272, 273, 274, 275, 286, 287	WTGs are from one of the largest suppliers and O&M contracts for wind farm and solar farm are performance based transferring risk to sub-contractors who are were also the suppliers and installers.	A	1
2.4 Commissioning tests are documented and completed	18, 93, 276	Windfarm commissioning is fully documented on site and Vesta's SAP database provides performance indices for similar WTG worldwide. Performance enhancements from this database have been implemented at the Emu Downs Wind Farm Joint Venture .	A	1
2.5 Ongoing legal / environmental / safety obligations of the asset owner are assigned and understood	2, 3, 4, 5, 6, 7, 10, 15, 16, 18, 19, 20, 21, 22, 31, 32, 34, 35, 36, 37, 38, 39, 40, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 131, 135,	Compliance manual covers all obligations and these are reflected in procedures and reporting. There were no LTI or environmental (incidents bird and bat mortality, noise) issues during the reporting period	A	1

	136, 140, 142, 143, 144, 156, 202, 249, 272, 273, 274, 277, 285, 286, 287			
Comments & Recommendations				

3.	<b>Key process - Asset disposal</b> Asset disposal is the consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets.	<b>Asset management process and policy definition adequacy rating</b>  <b>A</b>	<b>Asset management performance rating</b>  <b>1</b>
	<b>Outcome</b> The asset management framework minimises holdings of surplus and underperforming assets and lowers service costs. The cost-benefits of disposal options are evaluated.		
<b>Interviewees:</b> APA Paul McLagan      Operations Manager - Power Division  APA Stuart Dodds      Asset Manager Renewables and Transmission - Power Division  APA Glen Thomsen      Commercial Manager - Power Division  APA Naomi Donohue      Market & Regulatory Specialist - Power Division		<b>Relevant documentation:</b> 18      EDWF 33180101R4 - AMS Rev 4.pdf 19      EDWF O&M Report - July 2015 to June 2016.pdf 20      EDWF O&M Report - July 2016 to June 2017.pdf 22      EDRF OM Report - July 2018 to June 2019.pdf 93      Vestas SAP database 267      EDRF 33180104S - SVC Air-con.pdf 268      EDWF-E-5212 Rev 03.pdf 269      EDWF-E-5213-1 Rev 03.pdf 270      EDWF-E-5213-4 Rev 04.pdf 271      Risk Assessment - SVC Air-con.pdf	

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
3.1 Under-utilised and under-performing assets are identified as part of a regular systematic review process	18, 93, 267, 268, 269, 270, 271	WTG overall and component performance is compared against Vesta's SAP database benchmarks. Air-conditioning of the SVC lacked reserve capacity and utilised an obsolete refrigerant. This was investigated, alternative refrigerants reduced performance and a new system with N-1 redundancy installed.	A	1
3.2 The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	18, 93, 267, 268, 269, 270, 271	Poor performing equipment is investigated using Vesta's SAP comprehensive database that provides detail examples of normal and abnormal conditions and rectification. Emu Downs Wind Farm examples are changing bearing lubrication from oil to grease and aerodynamic improvements to blades. Emu Downs Solar Farm example is dc connectors faulty due to lack of slack in cables.	A	1
3.3 Disposal alternatives are evaluated	18	Emu Downs Wind Farm Joint Venture is in mid-life and operating profitably. Disposal is not a consideration at this stage. Consumables are limited, used lubricants are taken off site, failed equipment is collected and taken off site for refurbishment or recycling.	A	1

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
3.4 There is a replacement strategy for assets	18, 19, 20, 22	Spares are held on site and through the Vesta's network. Routine servicing of the WTGs is continuous with a stock of consumables held. Balance of plant spares are also held, e.g. SVC transformer. Others, such as the step up transformers have been shown to be uneconomic considering there is partial back through the second transformer.	A	1

Comments & Recommendations

4.	<p><b>Key Process - Environmental analysis</b>                      Environmental analysis examines the asset management system environment and assesses all external factors affecting the asset management system.</p> <p><b>Outcome</b>                      The asset management system regularly assesses external opportunities and threats and identifies corrective action to maintain performance requirements.</p>	<p><b>Asset management process and policy definition adequacy rating</b></p> <p><b>A</b></p>	<p><b>Asset management performance rating</b></p> <p><b>1</b></p>
<p><b>Interviewees:</b></p> <p>APA Paul McLagan      Operations Manager - Power Division</p> <p>APA Stuart Dodds      Asset Manager Renewables and Transmission - Power Division</p> <p>APA Glen Thomsen      Commercial Manager - Power Division</p> <p>APA Naomi Donohue      Market &amp; Regulatory Specialist - Power Division</p>		<p><b>Relevant documentation:</b></p> <p>2      330-MAN-CMP-8000 - EDRF BRF Wind and Solar Farm Compliance Manual.pdf</p> <p>3      Superseded 33160101R0 Compliance Monitoring Program.pdf</p> <p>4      33170101R1 EDWF Year Plan 2017-2018.pdf</p> <p>5      33180101R1 EDWF Year Plan 2018-2019.pdf</p> <p>6      33190101R EDWF Year Plan 2019-2020 Rev 1.pdf</p> <p>7      33180104R0 - CMP Report.pdf</p> <p>9      EDRF 33180103R3 - Risk Management - Rev 3.pdf</p> <p>10      EDRF 33190101S - Sapphire License.pdf</p> <p>12      EDRF Risk Guide 2018.pdf</p> <p>13      EDRF Risk Summary 2019.pdf</p> <p>18      EDWF 33180101R4 - AMS Rev 4.pdf</p> <p>19      EDWF O&amp;M Report - July 2015 to June 2016.pdf</p> <p>20      EDWF O&amp;M Report - July 2016 to June 2017.pdf</p> <p>21      EDRF O&amp;M Report - July 2017 to June 2018.pdf</p> <p>22      EDRF OM Report - July 2018 to June 2019.pdf</p> <p>23      EDWF Operating Protocol V2 Final_signed.pdf</p> <p>24      EDWF Risk Register 2016.pdf</p> <p>25      EDWF Risk Register 2017.pdf</p> <p>26      EDWF Risk Register 2018.pdf</p>	

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60	14. NTI Green Power Accreditation Invoice June 2018 - EDWF.pdf
61	14. NTI Green Power Accreditation Payment Jun 2016 - EDWF.pdf
62	14. NTI Green Power Accreditation Payment Jun 2017 - EDWF.pdf
63	14. NTI Green Power Accreditation Payment Jun 2018 - EDWF.pdf
64	15. Authority Invoice June 2016 - EDWF.pdf
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Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
4.1 Opportunities and threats in the asset management system environment are assessed	4, 5, 6, 9, 12, 13, 18, 24, 25, 26, 27, 28, 29, 30, 31, 32	SWOT analysis forms part of the annual Year Plan reports. There are some indications that this is reviewed annually but the windfarm is described as 10yrs old for three consecutive annual reports, rectified in the latest report that has a revised SWOT analysis	A	1
4.2 Performance standards (availability of service, capacity, continuity, emergency response, etc.) are measured and achieved	2, 3, 7, 10, 18, 19, 20, 21, 22, 23, 93, 94, 99, 103, 104, 105, 106, 113, 114, 126, 154, 156, 202, 249, 275, 277, 285, 287	Performance standards are monitored and reported in O&M monthly reports. Technical compliance with Western Power's requirements are monitored with Elspec units and mainly met. The WFS incorporates some automated performance reporting. Contract availability has been achieved and has been set at a higher level in the new O&M contract for the windfarm. No community complaints were received during the reporting period.	A	1
4.3 Compliance with statutory and regulatory requirements	2, 3, 7, 10, 18, 19, 20, 21, 22, 23, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 81, 82, 83, 84, 127, 135, 142, 144, 147, 151, 156, 202, 249, 275, 277, 285, 287	Compliance is monitored and reported in the CMP, meetings and via WFS with few non compliances attributable to Emu Downs Wind Farm Joint Venture.	A	1

4.4 Service standard (customer service levels etc.) are measured and achieved	2, 3, 7, 18, 19, 20, 21, 22, 92, 93, 94, 105, 106, 116, 156, 202, 249, 277, 285, 287	Customer service levels are mainly achieved and documented in the monthly and annual reports. Non-compliances are reported through the WFS and manually.	A	1
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Comments & Recommendations

5.	Key Process - Asset operations Asset operations is the day-to- day running of assets (where the asset is used for its intended purpose).	Asset management process and policy definition adequacy rating	Asset management performance rating
	<b>Outcome</b> The asset operation plans adequately document the processes and knowledge of staff in the operation of assets so service levels can be consistently achieved.	<b>A</b>	<b>1</b>
<b>Interviewees:</b> APA Paul McLagan Operations Manager - Power Division APA Stuart Dodds Asset Manager Renewables and Transmission - Power Division APA Glen Thomsen Commercial Manager - Power Division APA Naomi Donohue Market & Regulatory Specialist - Power Division Vestas Ian Manns EDWF Site Supervisor UGL Thomas Ray Commissioning Engineer UGL Gary Stone Operations Engineer - Renewables		<b>Relevant documentation:</b> 3 Superseded 33160101R0 Compliance Monitoring Program.pdf 9 EDRF 33180103R3 - Risk Management - Rev 3.pdf 10 EDRF 33190101S - Sapphire License.pdf 11 EDRF Document Register - 2019.pdf 12 EDRF Risk Guide 2018.pdf 13 EDRF Risk Summary 2019.pdf 14 EDWF - 190216-01 - Farm Rules Rev 1.pdf 15 EDWF - 280116-01 - OH&S Policy.pdf 16 EDWF - 280116-02 - Environmental Policy.pdf 17 EDWF 33170103R1 - Project Procedure.pdf 18 EDWF 33180101R4 - AMS Rev 4.pdf 19 EDWF O&M Report - July 2015 to June 2016.pdf 20 EDWF O&M Report - July 2016 to June 2017.pdf 21 EDRF O&M Report - July 2017 to June 2018.pdf	

UGL	John Maroney	Junior Operations Engineer - Renewables	22	EDRF OM Report - July 2018 to June 2019.pdf
			23	EDWF Operating Protocol V2 Final_signed.pdf
			24	EDWF Risk Register 2016.pdf
			25	EDWF Risk Register 2017.pdf
			26	EDWF Risk Register 2018.pdf
			27	EDWF Risk Register 2019.pdf
			28	EDWF Risk Summary 2016.pdf
			29	EDWF Risk Summary 2017.pdf
			30	EDWF Risk Summary 2018.pdf
			34	2. FY2016 APT Audit Report.pdf
			35	2. FY2016 APTIT Audit Report.pdf
			36	2. FY2017 APT Audit Report.pdf
			37	2. FY2017 APTIT Audit Report.pdf
			38	2. FY2018 APTIT Auditor Report.pdf
			39	2. HY2019 APT Audit Report.pdf
			40	2. HY2019 APTIT Audit Report.pdf
			42	3.1 Profit & Lose - EDSF.xlsx
			43	3.1 Profit & loss - EDWF.xlsx
			44	3.2 Balance Sheet - EDSF.xlsx
			45	3.2 Balance Sheet - EDWF.xlsx
			46	3.3 Revenue Projections - EDWF.xlsx
			52	08. EDRF FAR.xlsx
			56	12. Fix Asset Register - EDSF.xlsx
			57	12. Fix Asset Register- EDWF.xlsx
			71	EDWF System Recovery Document 2019.pdf
			77	MD70 Wind Forecast System.pdf
			92	Asset%20Management%20Plan_Emu%20Downs%20-%2009112017.pdf

93	Vestas SAP database
95	EDWF Substation Scheduled Maintenance Rev 3 - 12-3-19.pdf
96	EDWF Substation Spares 12-03-19.xls
97	EDRF Schedule Maintenance.xls
98	EDRF HV Switching 2018.pdf
100	APA.WA.CA.699_Emu Downs OM_Executed_Word Searchable.pdf
102	WA Elc Contractor Licence_2018-02-19.pdf
104	INS SUS-IMP-EWC ASP_Extreme weather (002).pdf
108	WHSP\Addendum 4 - Site Risk Register.pdf
109	WHSP\Addendum 6 - Environmental Aspects and Control Mechansims.pdf
110	WHSP\Addendum 6 - EDWF Environmental Aspects and Control Mechansims.docx
114	WHSP\Addendum 12 - Health and Safety Incident Reporting Requirements.pdf
115	WHSP\EDWF WHSEMP - SC016666.pdf
119	WHSP\Vestas_Drug%20%20Alcohol- Free%20Workplace%20Policy%20R.1.pdf
124	Asset Criticality C ED CR M W S E.xlsx
126	06 UGL Contract #126-144
134	EDSF O&M Contract - Schedule 6 Key Personnel.pdf
135	EDSF O&M Contract - Schedule 7 Government Approvals.pdf
142	EDSF O&M Contract - Schedule 16 WHSE Requirements.pdf
144	EDSF O&M Contract - Schedule 18 ARENA Requirements.pdf
151	EDWF Operating Protocol V2 Final_signed.pdf
156	MCM monthly meetings notes # 158-201
202	EDWF O and M Notes #204-249
249	EDSF O and M Notes #250-265
275	ARENA LSS Project Plan EDSF 15 June 2016.pdf

	277	Emu Downs Wind Farm - AMP.docx
	278	Operation and Maintenance Plan - EMU DOWNS 2019.pdf"
	280	3200-0544 Emu Downs - Emergency Response Plan Rev B.pdf"
	281	3200-0544 Emu Downs Project Safety Management Plan Rev 0A.pdf"
	282	3200-0544-PLN-003_R1 - Project Quality Plan.pdf"
	284	Avail Calc Summary 2019.pdf"
	285	EDSF O&M HSSE Risk Register R0A - EIMS-7-5448 - Section 2 BR.pdf
	286	EDSF-MAN-OM-0001_1_AB.pdf"
	287	Emu Downs - Operating Protocol - Rev 0.pdf

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance rating
5.1 Operational policies and procedures are documented and linked to service levels required	3, 10, 12, 14, 15, 16, 17, 18, 23, 77, 93, 95, 96, 97, 98, 100, 109, 110, 114, 115, 119, 126, 135, 144, 151, 277, 278, 279, 280, 281, 284, 286, 287	Sapphire software upgrade allows EDSF to be incorporated in compliance reporting. CMP database monitors performance WP System Management have visibility of availability, capacity etc. and can limit output. Vestas and UGL reflect service levels in their processes	A	1
5.2 Risk management is applied to prioritise operations tasks	9, 11, 12, 13, 18, 24, 25, 26, 27, 28, 29, 30, 71, 93, 95, 97, 104, 108, 124, 277, 285, 286	With 48 WTG and over 60,000PV panels O&M is ongoing. Maintenance tasks have a +/- 2 week window to allow for non-scheduled tasks which are prioritised on risk, in particular availability and performance. The Vestas world database assists in risk assessment maintenance planning.	A	1
5.3 Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural condition and accounting data	18, 52, 56, 57, 92, 93, 100, 126, 277, 286	Finance maintain an asset register, as do the O&M Contractors, Vestas using their SAP program which assists in maintenance planning and recording condition and history. The solar farm is being integrated into this system.	A	1

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance rating
5.4 Operational costs are measured and monitored	18, 19, 20, 21, 22, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 92, 93, 100, 126, 156, 202, 249, 275	Fixed O&M costs are incorporated in the O&M Contracts apart from force majeure, SVC and step up transformers unscheduled faults. Unscheduled O&M costs are monitored and reported in monthly and annual reports,	A	1
5.5 Staff resources are adequate and staff receive training commensurate with their responsibilities	18, 92, 98, 100, 102, 134, 142, 278	All staff have to be appropriately trained; eg HV switching, working at heights, electrician licence. Vestas have comprehensive training for their staff specific to their operating systems, working in towers etc. Vestas were sub-contracted for day to day O&M of the solar farm during the audit period.	A	1
Comments & Recommendations				

6.	Key process - Asset maintenance		Asset management process and policy definition adequacy rating	Asset management performance rating
	Outcome			
	Asset maintenance is the upkeep of assets.		A	1
	The asset maintenance plans cover the scheduling and resourcing of the maintenance tasks so work can be done on time and on cost.			
Interviewees:			Relevant documentation:	
APA	Paul McLagan	Operations Manager - Power Division	2	330-MAN-CMP-8000 - EDRF BRF Wind and Solar Farm Compliance Manual.pdf
APA	Stuart Dodds	Asset Manager Renewables and Transmission - Power Division	3	Superseded 33160101R0 Compliance Monitoring Program.pdf
APA	Glen Thomsen	Commercial Manager - Power Division	4	33170101R1 EDWF Year Plan 2017-2018.pdf
			5	33180101R1 EDWF Year Plan 2018-2019.pdf
APA	Naomi Donohue	Market & Regulatory Specialist - Power Division	6	33190101R EDWF Year Plan 2019-2020 Rev 1.pdf
			7	33180104R0 - CMP Report.pdf
Vestas	Ian Manns	EDWF Site Supervisor	9	EDRF 33180103R3 - Risk Management - Rev 3.pdf
			12	EDRF Risk Guide 2018.pdf
UGL	Thomas Ray	Commissioning Engineer	13	EDRF Risk Summary 2019.pdf
			18	EDWF 33180101R4 - AMS Rev 4.pdf
UGL	Gary Stone	Operations Engineer - Renewables	19	EDWF O&M Report - July 2015 to June 2016.pdf
			20	EDWF O&M Report - July 2016 to June 2017.pdf
UGL	John Maroney	Junior Operations Engineer - Renewables	21	EDRF O&M Report - July 2017 to June 2018.pdf
			22	EDRF OM Report - July 2018 to June 2019.pdf
			23	EDWF Operating Protocol V2 Final_signed.pdf
			24	EDWF Risk Register 2016.pdf
			25	EDWF Risk Register 2017.pdf
			26	EDWF Risk Register 2018.pdf
			27	EDWF Risk Register 2019.pdf
			28	EDWF Risk Summary 2016.pdf
			29	EDWF Risk Summary 2017.pdf
			30	EDWF Risk Summary 2018.pdf



31	EDWF Year Plan 2015-2016 Rev 1.pdf
32	EDWF Year Plan 2016-2017 Rev 0.pdf
41	03. Document list.xlsx
42	3.1 Profit & Lose - EDSF.xlsx
43	3.1 Profit & loss - EDWF.xlsx
44	3.2 Balance Sheet - EDSF.xlsx
45	3.2 Balance Sheet - EDWF.xlsx
46	3.3 Revenue Projections - EDWF.xlsx
54	9. O&M Cost Drive - EDSF.pdf
55	9. O&M Cost Drive - EDWF.pdf
92	
	Asset%20Management%20Plan_Emu%20Downs%20-%200911
20	
93	Vestas SAP database
95	EDWF Substation Scheduled Maintenance Rev 3 - 12-3-19.pdf
97	EDRF Schedule Maintenance.xls
100	APA.WA.CA.699_Emu Downs OM_Executed_Word Searchable.pdf
107	WHSP\Addendum 4 - EDWF Risk Register and Control Matrix.doc
111	WHSP\Addendum 7 - Safety Environmental Check Form.pdf
112	WHSP\Addendum 11 - EDWF ERP Rev F.DOC
120	0000-2968.pdf
121	0000-9776.pdf
122	0003-9663.pdf
123	20190731114817535.pdf
131	EDSF O&M Contract - Schedule 3 Scope of Services.pdf
137	EDSF O&M Contract - Schedule 9 Availability Guarantee.pdf
139	EDSF O&M Contract - Schedule 13 Maintenance Facilities.pdf

	140	EDSF O&M Contract - Schedule 14 Reports.pdf
	141	EDSF O&M Contract - Schedule 15 Spare Parts.pdf
	146	EDRF - 260718-01 - Maintenance Schedule.pdf
	147	EDRF - Operating Agreement - Contacts.pdf
	148	EDWF - 090816-01 - Maintenance Schedule.pdf
	149	EDWF - 220817-02 - Maintenance Schedule.pdf
	150	EDWF - 240915-01 - Maintenance Schedule.pdf
	156	MCM monthly meetings notes # 158-201
	202	EDWF O and M Notes #204-249
	249	EDSF O and M Notes #250-265
	271	Risk Assessment - SVC Air-con.pdf
	272	SVC DRAFT Arc Flash Safety RA 20th May 2019.pdf
	277	Emu Downs Wind Farm - AMP.docx
	278	Operation and Maintenance Plan - EMU DOWNS 2019.pdf"
	280	3200-0544 Emu Downs - Emergency Response Plan Rev B.pdf"
	281	3200-0544 Emu Downs Project Safety Management Plan Rev 0A.pdf"
	282	3200-0544-PLN-003_R1 - Project Quality Plan.pdf"
	284	Avail Calc Summary 2019.pdf"
	285	EDSF O&M HSSE Risk Register R0A - EIMS-7-5448 - Section 2 BR.pdf
	286	EDSF-MAN-OM-0001_1_AB.pdf"
	287	Emu Downs - Operating Protocol - Rev 0.pdf

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
6.1 Maintenance policies and procedures are documented and linked to service levels required	2, 3, 7, 19, 20, 21, 22, 23, 41, 92, 93, 95, 97, 100, 120, 121, 122, 123, 131, 137, 139, 146, 147, 148, 149, 150, 156, 202, 249, 277, 278, 286, 287	Maintenance requirements are specified in the O&M Contracts and plans included in monthly and annual reports with a 12 month look ahead.  Work impacting on generation are scheduled for low wind season for the wind farm and low solar inundation periods for EDSF. Advantage is taken of any Western Power scheduled outages for substation work.	A	1
6.2 Regular inspections are undertaken of asset performance and condition	18, 19, 20, 21, 22, 92, 93, 100, 131, 140, 156, 202, 249, 277, 278, 287	Performance is closely monitored electronically and routine inspections made of the facility as per the contracts.  Feedback from similar Vestas operations are employed in maintenance.	A	1
6.3 Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	4, 5, 6, 18, 19, 20, 21, 22, 92, 93, 97, 100, 111, 112, 131, 139, 140, 141, 156, 202, 249, 278, 287	Routine maintenance has to be on schedule as required in the contracts.  Preventative maintenance is often the initiative of the contractor to minimise their exposure to penalties.  All maintenance is reported to APA and entered in the SAP database.  A full history of each WTG is available and the solar farm is now incorporated in this too.	A	1
6.4 Failures are analysed and operational/ maintenance	18, 92, 93, 100, 131, 156, 202, 249	Failures are analysed and responded to and reported in the monthly and annual reports.	A	1

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
plans adjusted where necessary		The Vestas global database provides assistance in analysis and correction		
6.5 Risk management is applied to prioritise maintenance tasks	4, 5, 6, 9, 12, 13, 18, 24, 25, 26, 27, 28, 29, 30, 31, 32, 92, 100, 107, 131, 156, 202, 249, 271, 272	Risk management is applied to prioritise maintenance tasks.	A	1
6.6 Maintenance costs are measured and monitored	18, 19, 20, 21, 22, 42, 43, 44, 45, 46, 54, 55, 92, 93, 100, 131, 156, 202, 249	Scheduled maintenance costs are included in the contract. Unscheduled costs are monitored and reported monthly and annually.	A	1
Comments & Recommendations				

7.	<p><b>Key process - Asset Management Information System (MIS)</b>                  An asset management information system is a combination of processes, data and software supporting the asset management functions.</p> <p><b>Outcome</b>                  The asset management information system provides authorised, complete and accurate information for the day-to-day 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</p>	<p><b>Asset management process and policy definition adequacy rating</b></p> <p style="text-align: center;"><b>A</b></p>	<p><b>Asset management performance rating</b></p> <p style="text-align: center;"><b>1</b></p>
<p><b>Interviewees:</b></p> <p>APA Paul McLagan Operations Manager - Power Division</p> <p>APA Stuart Dodds Asset Manager Renewables and Transmission - Power Division</p> <p>APA Glen Thomsen Commercial Manager - Power Division</p> <p>APA Naomi Donohue Market &amp; Regulatory Specialist - Power Division</p> <p>Vestas Ian Manns EDWF Site Supervisor</p>		<p><b>Relevant documentation:</b></p> <p>2 330-MAN-CMP-8000 - EDRF BRF Wind and Solar Farm Compliance Manual.pdf</p> <p>3 Superseded 33160101R0 Compliance Monitoring Program.pdf</p> <p>4 33170101R1 EDWF Year Plan 2017-2018.pdf</p> <p>5 33180101R1 EDWF Year Plan 2018-2019.pdf</p> <p>6 33190101R EDWF Year Plan 2019-2020 Rev 1.pdf</p> <p>7 33180104R0 - CMP Report.pdf</p> <p>9 EDRF 33180103R3 - Risk Management - Rev 3.pdf</p> <p>18 EDWF 33180101R4 - AMS Rev 4.pdf</p> <p>31 EDWF Year Plan 2015-2016 Rev 1.pdf</p> <p>32 EDWF Year Plan 2016-2017 Rev 0.pdf</p> <p>41 03. Document list.xlsx</p> <p>71 EDWF System Recovery Document 2019.pdf</p> <p>72 EDWFS _ Business Impact Analysis 2018.pdf</p> <p>73 EDWFS System Recovery Sheet 2019.pdf</p>	

	74	IM-090_INSTALLATION_INSTRUCTIONS.pdf
	75	IT Backup Standard v1.2.pdf
	76	Linux Environment and Oracle Database_SRD.pdf
	77	MD70 Wind Forecast System.pdf
	93	Vestas SAP database
	156	MCM monthly meetings notes # 158-201
	202	EDWF O and M Notes #204-249
	249	EDSF O and M Notes #250-265

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
7.1 Adequate system documentation for users and IT operators	9, 18, 71, 72, 73, 74, 75, 76, 77, 93	Vestas database ensures only latest updates are read. Hard copies are not allowed and only smart phones are used in WTG towers (working at heights). Database is very comprehensive with records, instructions, examples and images. Database now includes the solar farm.	A	1
7.2 Input controls include suitable verification and validation of data entered into the system	2, 3, 7, 9, 18, 74, 75, 76, 77, 93	Tariff metering is by WP dual meters with APA cross checking. Key parameters are visible to System Management.	A	1
7.3 Security access controls appear adequate, such as passwords	9, 18, 76, 77, 93	Computer access is limited to staff and passwords are in place. Firewalls and virus protection are in place.	A	1
7.4 Physical security access controls appear adequate	18, 71, 73, 75, 76, 93	Emu Downs Wind Farm Joint Venture is located in a sparsely populated area with good relationships with the community and landowner. The compound is fenced and gated. WTG tower doors are locked. CCTV is installed at the solar farm.	A	1
7.5 Data backup procedures appear adequate and backups are tested	18, 71, 73, 75, 93	CMP computer is backed up to two separate remote data centres with mirrored servers, back up to tapes is also performed on site with tapes later stored off site. The system has been tested but reloading has never been required.	A	1

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
		Vestas global computer system and has sophisticated protection.		
7.6 Computations for licensee performance reporting are accurate	9, 18, 77, 93	With the introduction of the new WFS generation forecasting has improved to one of the best AEMO get for renewables. System management have visibility to output, status and power quality. Duplicate WP metering and APA parity check.	A	1
7.7 Management reports appear adequate for the licensee to monitor licence obligations	18, 77	Separate management committee (MCM), Vestas and UGL monthly meetings include performance and compliance records and are summarised in annual reports. Management are notified of non-compliances when they are found.	A	1
7.8 Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	18, 71, 73, 74, 75, 76, 93	APA corporate system has a high level of security. Firewalls are in place to prevent external access to computers.	A	1

Comments & Recommendations



8.	<b>Key Process - Risk Management</b> Risk management involves the identification of risks and their management within an acceptable level of risk.	Asset management process and policy definition adequacy rating	Asset management performance rating
	<b>Outcome</b> The risk management framework effectively manages the risk that the licensee does not maintain effective service standards		
		<b>A</b>	<b>1</b>
<b>Interviewees:</b>		<b>Relevant documentation:</b>	
APA	Paul McLagan Operations Manager - Power Division	4	33170101R1 EDWF Year Plan 2017-2018.pdf
		5	33180101R1 EDWF Year Plan 2018-2019.pdf
APA	Stuart Dodds Asset Manager Renewables and Transmission - Power Division	6	33190101R EDWF Year Plan 2019-2020 Rev 1.pdf
APA	Glen Thomsen Commercial Manager - Power Division	9	EDRF 33180103R3 - Risk Management - Rev 3.pdf
		12	EDRF Risk Guide 2018.pdf
		13	EDRF Risk Summary 2019.pdf
APA	Naomi Donohue Market & Regulatory Specialist - Power Division	17	EDWF 33170103R1 - Project Procedure.pdf
		18	EDWF 33180101R4 - AMS Rev 4.pdf
Vestas	Ian Manns EDWF Site Supervisor	24	EDWF Risk Register 2016.pdf
		25	EDWF Risk Register 2017.pdf
UGL	Thomas Ray Commissioning Engineer	26	EDWF Risk Register 2018.pdf
		27	EDWF Risk Register 2019.pdf
UGL	Gary Stone Operations Engineer - Renewables	28	EDWF Risk Summary 2016.pdf
		29	EDWF Risk Summary 2017.pdf
UGL	John Maroney Junior Operations Engineer - Renewables	30	EDWF Risk Summary 2018.pdf
		31	EDWF Year Plan 2015-2016 Rev 1.pdf
		32	EDWF Year Plan 2016-2017 Rev 0.pdf
		71	EDWF System Recovery Document 2019.pdf
		72	EDWFS _ Business Impact Analysis 2018.pdf
		73	EDWFS System Recovery Sheet 2019.pdf
		75	IT Backup Standard v1.2.pdf

81	EDRF Compliance Register 17-18.pdf
92	Asset%20Management%20Plan_Emu%20Downs%20-%2009112017.pdf
93	Vestas SAP database
94	0544 EDSF OM Monthly Meeting Minutes_20190613_.pdf
100	APA.WA.CA.699_Emu Downs OM_Executed_Word Searchable.pdf
104	INS SUS-IMP-EWC ASP_Extreme weather (002).pdf
107	WHSP\Addendum 4 - EDWF Risk Register and Control Matrix.doc
108	WHSP\Addendum 4 - Site Risk Register.pdf
113	WHSP\Addendum 11 - Emergency Response Plan.pdf
124	Asset Criticality C ED CR M W S E.xlsx
151	EDWF Operating Protocol V2 Final_signed.pdf
271	Risk Assessment - SVC Air-con.pdf
272	SVC DRAFT Arc Flash Safety RA 20th May 2019.pdf

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
8.1 Risk management policies and procedures exist and are applied to minimise internal and external risks	4, 5, 6, 9, 12, 13, 17, 18, 24, 25, 26, 27, 28, 29, 30, 31, 32, 72, 92, 100, 104, 107, 108, 113, 124, 271, 272	The relatively small scale of Emu Downs Wind Farm Joint Venture when compared to APA's other assets means corporate risk in financial terms can appear low. Vesta's risk criteria are more sensitive and what in APA's terms could be a minor consequence (<\$1.5M) would be catastrophic for Vestas (>USD0.5M)	A	2
8.2 Risks are documented in a risk register and treatment plans are implemented and monitored	9, 13, 18, 24, 25, 26, 27, 28, 29, 30, 81, 92, 93, 100, 107, 108, 271, 272	APA's and Vestas risk registers are maintained, with annual review and updates as required. Controls are put in place.	A	1
8.3 Probability and consequences of asset failure are regularly assessed	9, 13, 18, 24, 25, 26, 27, 28, 29, 30, 93, 100, 107, 108	The Vestas database records and shares problems encountered with similar WTGs worldwide and provide rectification advice.	A	1
Comments & Recommendations				

9.	<b>Key Process - Contingency Planning</b> Contingency plans document the steps to deal with the unexpected failure of an asset.		<b>Asset management process and policy definition adequacy rating</b>  <b>A</b>	<b>Asset management performance rating</b>  <b>1</b>
	<b>Outcome-</b> Contingency plans have been developed and tested to minimise any major disruptions to service standards.			
<b>Interviewees:</b>			<b>Relevant documentation:</b>	
APA	Paul McLagan	Operations Manager - Power Division	13	EDRF Risk Summary 2019.pdf
APA	Stuart Dodds	Asset Manager Renewables and Transmission - Power Division	18	EDWF 33180101R4 - AMS Rev 4.pdf
APA	Glen Thomsen	Commercial Manager - Power Division	28	EDWF Risk Summary 2016.pdf
APA	Naomi Donohue	Market & Regulatory Specialist - Power Division	29	EDWF Risk Summary 2017.pdf
Vestas	Ian Manns	EDWF Site Supervisor	30	EDWF Risk Summary 2018.pdf
			71	EDWF System Recovery Document 2019.pdf
			72	EDWFS _ Business Impact Analysis 2018.pdf
			73	EDWFS System Recovery Sheet 2019.pdf
			75	IT Backup Standard v1.2.pdf
			93	Vestas SAP database
			94	0544 EDSF OM Monthly Meeting Minutes_20190613_.pdf
			100	APA.WA.CA.699_Emu Downs OM_Executed_Word Searchable.pdf
			104	INS SUS-IMP-EWC ASP_Extreme weather (002).pdf
			151	EDWF Operating Protocol V2 Final_signed.pdf

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
9.1 Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	13, 18, 28, 29, 30, 71, 72, 73, 75, 93, 94, 100, 104, 151	Extreme weather response; wind and lightning, happens most years. Plant outages eg step up transformer, 22kV bus tie etc. are applied for routine and contingency e.g. buchholtz trip, CT failure.	A	1
Comments & Recommendations				

10.	<b>Key Process - Financial Planning</b> Financial brings together the financial elements of the service delivery to ensure its financial viability over the long term.	<b>Asset management process and policy definition adequacy rating</b>  <b>A</b>	<b>Asset management performance rating</b>  <b>1</b>
	<b>Outcome</b> The financial plan is reliable and provides for the long- term financial viability of the services.		
<b>Interviewees:</b> APA Paul McLagan      Operations Manager - Power Division  APA Stuart Dodds      Asset Manager Renewables and Transmission - Power Division  APA Glen Thomsen      Commercial Manager - Power Division  APA Naomi Donohue      Market & Regulatory Specialist - Power Division		<b>Relevant documentation:</b> 4      33170101R1 EDWF Year Plan 2017-2018.pdf 5      33180101R1 EDWF Year Plan 2018-2019.pdf 6      33190101R EDWF Year Plan 2019-2020 Rev 1.pdf 17      EDWF 33170103R1 - Project Procedure.pdf 18      EDWF 33180101R4 - AMS Rev 4.pdf 31      EDWF Year Plan 2015-2016 Rev 1.pdf 32      EDWF Year Plan 2016-2017 Rev 0.pdf 34      2. FY2016 APT Audit Report.pdf 35      2. FY2016 APTIT Audit Report.pdf 36      2. FY2017 APT Audit Report.pdf 37      2. FY2017 APTIT Audit Report.pdf 38      2. FY2018 APTIT Auditor Report.pdf 39      2. HY2019 APT Audit Report.pdf 40      2. HY2019 APTIT Audit Report.pdf 42      3.1 Profit & Lose - EDSF.xlsx 43      3.1 Profit & loss - EDWF.xlsx 44      3.2 Balance Sheet - EDSF.xlsx 45      3.2 Balance Sheet - EDWF.xlsx 46      3.3 Revenue Projections - EDWF.xlsx 48      6. FY19 Capex Plan - EDWF.pdf 49      6. FY20 Capex Plan - EDSF.pdf	

	50	6. FY20 Capex Plan - EDWF.pdf
	51	7. Capex Act v Bud FY19.xlsx
	53	8. Capex Review Process.pdf
	54	9. O&M Cost Drive - EDSF.pdf
	55	9. O&M Cost Drive - EDWF.pdf
	100	APA.WA.CA.699_Emu Downs OM_Executed_Word Searchable.pdf
	131	EDSF O&M Contract - Schedule 3 Scope of Services.pdf
	275	ARENA LSS Project Plan EDSF 15 June 2016.pdf

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Adequacy Rating
10.1 The financial plan states the financial objectives and identifies strategies and actions to achieve those	4, 5, 6, 17, 18, 31, 32, 39, 48, 49, 50, 51, 53, 100, 131, 275	Financial plans are prepared each year and set budgets for future cash flow. Emu Downs Wind Farm Joint Venture is an established operating generator with no major changes planned so forecasting is mainly revenue and O&M costs.	A	1
10.2 The financial plan identifies the source of funds for capital expenditure and recurrent costs	18, 34, 35, 36, 37, 38, 39, 40, 275	No major new capital expenditure is planned. Operating and revenue costs are well defined.	A	1
10.3 The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	18, 31, 32, 34, 35, 36, 37, 38, 39, 40, 46, 48, 49, 50, 51, 54, 55, 275	Financials are reported in monthly and annually, with operating costs and P&L and Balance. Finances are externally audited annually.	A	1
10.4 The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period	18, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 53	Revenue projections reflecting a slight drop off in WTG performance at the end of the project (2031) due to wear and possibly drop in wind speed. Projections are updated	A	1



Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Adequacy Rating
10.5 The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	18, 31, 32, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 48, 49, 50, 51, 53, 54, 55	O&M costs are defined in the O&M Contracts with only SVC and force majeure being APA's risk.	A	1
10.6 Large variances in actual/budget income and expenses are identified and corrective action taken where necessary	18, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 48, 49, 50, 51	Actuals are compared against budgeted and any variances are investigated. Examples. <ul style="list-style-type: none"> <li>• Energy loss is estimated for each outage, forced or unforced, and reported monthly.</li> <li>• Variance in EDSF generation due to wind curtailment</li> </ul>	A	1
Comments & Recommendations				

11.	<b>Key Process - Capital Expenditure Planning</b> The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure for these works over the next five or more years. Since capital investments tend to be large and lumpy projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates.	<b>Asset management process and policy definition adequacy rating</b>  <b>A</b>	<b>Asset management performance rating</b>  <b>1</b>
	<b>Outcome -</b> The capital expenditure plan provides reliable forward estimates of capital expenditure and asset disposal income. Reasons for the decisions and for the evaluation of alternatives and options are documented.		
<b>Interviewees:</b> APA Paul McLagan      Operations Manager - Power Division  APA Stuart Dodds      Asset Manager Renewables and Transmission - Power Division  APA Glen Thomsen      Commercial Manager - Power Division  APA Naomi Donohue      Market & Regulatory Specialist - Power Division		<b>Relevant documentation:</b> 4      33170101R1 EDWF Year Plan 2017-2018.pdf 5      33180101R1 EDWF Year Plan 2018-2019.pdf 6      33190101R EDWF Year Plan 2019-2020 Rev 1.pdf 18      EDWF 33180101R4 - AMS Rev 4.pdf 31      EDWF Year Plan 2015-2016 Rev 1.pdf 32      EDWF Year Plan 2016-2017 Rev 0.pdf 34      2. FY2016 APT Audit Report.pdf 35      2. FY2016 APTIT Audit Report.pdf 36      2. FY2017 APT Audit Report.pdf 37      2. FY2017 APTIT Audit Report.pdf 38      2. FY2018 APTIT Auditor Report.pdf 39      2. HY2019 APT Audit Report.pdf 40      2. HY2019 APTIT Audit Report.pdf 42      3.1 Profit & Lose - EDSF.xlsx 43      3.1 Profit & loss - EDWF.xlsx	

			44	3.2 Balance Sheet - EDSF.xlsx
			45	3.2 Balance Sheet - EDWF.xlsx
			48	6. FY19 Capex Plan - EDWF.pdf
			49	6. FY20 Capex Plan - EDSF.pdf
			50	6. FY20 Capex Plan - EDWF.pdf
			51	7. Capex Act v Bud FY19.xlsx
			53	8. Capex Review Process.pdf
			156	MCM monthly meetings notes # 158-201
			202	EDWF O and M Notes #204-249
			249	EDSF O and M Notes #250-265
Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy Rating	Performance Rating
11.1 There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates	4, 5, 6, 18, 31, 32, 34, 35, 36, 37, 38, 39, 40, 48, 49, 50, 51, 53	Forecast capital spending is limited to maintenance requirements and is incorporated in the annual plans.	A	1
11.2 The capital expenditure plan provides reasons for capital expenditure and timing of expenditure	4, 5, 6, 18, 31, 32, 48, 49, 50, 51	All non-contractor capital spending has to be justified and approved by APA. The contractor sometimes does capital works at their expense, to ensure that the O&M contract availability and performance is met. APA are informed of these.	A	1

11.3 The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	4, 5, 6, 18, 31, 32, 48, 49, 50, 51	Currently in midlife and capital expenditure is appropriate.	A	1
11.4 There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented	4, 5, 6, 18, 31, 32, 51, 53, 156, 202, 249	Plans are updated annually.	A	1
Comments & Recommendations				

12.	<b>Key Process - Review of AMS</b> The asset management system is regularly reviewed and updated	<b>Asset management process and policy definition adequacy rating</b>  <b>A</b>	<b>Asset management performance rating</b>  <b>1</b>
	<b>Outcome</b> The asset management system is regularly reviewed and updated.		
<b>Interviewees:</b>  APA Paul McLagan      Operations Manager - Power Division  APA Stuart Dodds      Asset Manager Renewables and Transmission - Power Division  APA Glen Thomsen      Commercial Manager - Power Division  APA Naomi Donohue      Market & Regulatory Specialist - Power Division		<b>Relevant documentation:</b>  2      330-MAN-CMP-8000 - EDRF BRF Wind and Solar Farm Compliance Manual.pdf 3      Superseded 33160101R0 Compliance Monitoring Program.pdf 7      33180104R0 - CMP Report.pdf 15      EDWF - 280116-01 - OH&S Policy.pdf 16      EDWF - 280116-02 - Environmental Policy.pdf 17      EDWF 33170103R1 - Project Procedure.pdf 18      EDWF 33180101R4 - AMS Rev 4.pdf 79      Approval of auditor - 2019 Audit and Review - EGL001 - Emu Downs Wind Fa....pdf 80      AUDITREPORT-6202-EDWF PA&AMSR 2015-01.1.pdf 85      EDWF - Post Audit Plan 2015 - Progress 15-12-16.pdf 89      Letter to Emu Downs - 2015 Audit & Review - EGL001.pdf 90      Letter to licensee - Commencement of audit and review - 2019 Audit and R....pdf 157      2015\07 EDWF MCM Notes - July 2015.pdf	

Criteria Effectiveness			Post Review Rating	
	Evidence Ref#	Performance	Adequacy rating	Performance Rating
12.1 A review process is in place to ensure the asset management plan and the asset management system described in it remain current	2, 3, 7, 15, 16, 17, 18, 80, 85, 89, 90	Review is prompted at monthly meetings. AMP revised to incorporate EDSF	A	1
12.2 Independent reviews (e.g. internal audit) are performed of the asset management system	18, 79, 80, 85, 90, 157	Economic Regulation Authority audits and reporting, financial audits and performance monitoring by System Management provide independent reviews.	A	1
Comments & Recommendations				

## **APPENDIX 3**

### **AUDIT PLAN ASSET REVIEW PRIORITIES**

**Table 17 Effectiveness Criteria Pre-audit Review**

Asset management system component	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
ASSET PLANNING					0	0	0	7	2	0
1.1. Asset management plan covers the processes in this table	2	C	MEDIUM	M				4		
1.2. Planning processes and objectives reflect the needs of all stakeholders and are integrated with business planning	2	C	MEDIUM	M				4		
1.3. Service levels are defined in the asset management plan	2	C	MEDIUM	M				4		
1.4. Non-asset options (e.g. demand management) are considered	1	C	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. Asset management plan is regularly reviewed and updated	1	C	LOW	M					5	
ASSET CREATION AND ACQUISITION					0	0	0	5	0	0



Asset management system component	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
2.1. Full project evaluations are undertaken for new assets, including comparative assessment of non- asset options	2	C	MEDIUM	M				4		
2.2. Evaluations include all life-cycle costs	2	C	MEDIUM	M				4		
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		
<b>ASSET DISPOSAL</b>					0	0	0	3	1	0
3.1. Under-utilised and under-performing assets are identified as part of a regular systematic review process	1	C	LOW	M					5	
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	2	C	MEDIUM	M				4		
3.4. There is a replacement strategy for assets	2	C	MEDIUM	M				4		
<b>ENVIRONMENTAL ANALYSIS</b>					0	0	0	4	0	0

Asset management system component	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
4.1. Opportunities and threats in the asset management system environment are assessed	2	C	MEDIUM	M				4		
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	S				4		
4.4. Service standard (customer service levels etc) are measured and achieved.	2	C	MEDIUM	M				4		
ASSET OPERATIONS					0	0	0	4	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, and an assessment of assets' physical/structural condition	2	C	MEDIUM	M				4		
5.4. Accounting data is documented for assets	2	C	MEDIUM	M				4		

Asset management system component	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
5.5. Operational costs are measured and monitored	2	C	MEDIUM	M				4		
5.6. Staff resources are adequate and staff receive training commensurate with their responsibilities.	2	C	MEDIUM	M				4		
<b>ASSET MAINTENANCE</b>					0	0	0	6	0	0
6.1. Maintenance policies and procedures are documented and linked to service levels required	2	C	MEDIUM	M				4		
6.2. Regular inspections are undertaken of asset performance and condition	2	C	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		

Asset management system component	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
ASSET MANAGEMENT INFORMATION SYSTEM					0	0	0	6	1	0
7.1. Adequate system documentation for users and IT operators	2	C	MEDIUM	M				4		
7.2. Input controls include suitable verification and validation of data entered into the system	2	C	MEDIUM	M				4		
7.3. Security access controls appear adequate, such as passwords	2	C	MEDIUM	M				4		
7.4. Physical security access controls appear adequate	2	C	MEDIUM	M				4		
7.5. Data backup procedures appear adequate and backups are tested	2	C	MEDIUM	M				4		
7.6. Computations for licensee performance reporting are accurate	2	C	MEDIUM	M				4		
7.7. Management reports appear adequate for the licensee to monitor licence obligations	1	C	LOW	M					5	
7.8. Adequate measures to protect asset management data from unauthorised access or theft by persons outside the organisation	2	C	MEDIUM	M				4		
RISK MANAGEMENT					0	0	0	3	0	0

Asset management system component	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
8.1. Risk management policies and procedures exist and are applied to minimise internal and external risks	2	C	MEDIUM	M				4		
8.2. Risks are documented in a risk register and treatment plans are implemented and monitored	2	C	MEDIUM	M				4		
8.3. Probability and consequences of asset failure are regularly assessed	2	C	MEDIUM	M				4		
CONTINGENCY PLANNING					0	0	0	1	0	0
9.1. Contingency plans are documented, understood and tested to confirm their operability and to cover higher	2	C	MEDIUM	M				4		
FINANCIAL PLANNING					0	0	0	6	0	0
10.1. The financial plan states the financial objectives and identifies strategies and actions to achieve those	2	C	MEDIUM	M				4		
10.2. The financial plan identifies the source of funds for capital expenditure and recurrent costs	2	C	MEDIUM	M				4		

Asset management system component	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
10.3. The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	2	C	MEDIUM	M				4		
10.4. The financial plan provides firm predictions on income for the next five years and reasonable predictions beyond this period	2	C	MEDIUM	M				4		
10.5. The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	2	C	MEDIUM	M				4		
10.6. Large variances in actual/budget income and expenses are identified and corrective action taken where necessary	2	C	MEDIUM	M				4		
<b>CAPITAL EXPENDITURE PLANNING</b>					0	0	0	3	1	0
11.1. There is a capital expenditure plan covering works to be undertaken, actions proposed, responsibilities and dates	1	C	LOW	M					5	

Asset management system component	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
11.2. The capital expenditure plan provides reasons for capital expenditure and timing of expenditure	2	C	MEDIUM	M				4		
11.3. The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	2	C	MEDIUM	M				4		
There is an adequate process to ensure the capital expenditure plan is regularly updated and implemented,	2	C	MEDIUM	M				4		
REVIEW OF AMS					0	0	0	0	2	0
12.1. A review process is in place to ensure the asset management plan and the asset management system described in it remain current	1	C	LOW	M					5	
12.2. Independent reviews (e.g. internal audit) are performed of the asset management system	1	C	LOW	M					5	
					0	0	0	49	9	0