



Network Quality and Reliability of Supply Code

2016/17 Performance Report

Prepared by: Asset Service Delivery
Audited by: Qualeng

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Horizon Power Service Areas

- Supply Area
- Office



1. INTRODUCTION

This report has been produced to meet the requirements of the Electricity Industry (Network Quality and Reliability of Supply) Code 2005, Schedule 1 – Information to be published.

To assist in meeting reporting requirements the Economic Regulation Authority Western Australia (ERAWA) publishes the Electricity Distribution Licence Performance Reporting Handbook which specifies measures to be reported. The report is prepared in accordance with Schedule 1 of the Code, however as Horizon Power is a vertically integrated business (responsible for generation, transmission and distribution) reliability data includes generation and transmission outages.

2. AUDIT BY INDEPENDENT EXPERT

Division 3 of the Electricity Industry (Network Quality and Reliability of Supply) Code 2005 requires that Horizon Power arrange for an independent expert to audit, and report on the operation of the systems that Horizon Power has in place for monitoring its compliance with the code.

Horizon Power has appointed Qualeng to perform the audit of its systems for compliance with the code. Qualeng is a locally based engineering consulting group with over 20 years engineering, regulatory and quality assurance expertise throughout various industries. Qualeng has a long and successful trading history and comprises a team of highly experienced consultants with recent, relevant and international expertise in the energy sector.

3. SCHEDULE 1 - INFORMATION TO BE PUBLISHED:

Clause 4 and 10

Clause 4(a) Number of breaches of each provision of the Code:

<i>Quality of Supply</i>	<i>2015/16</i>	<i>2016/17</i>
Voltage fluctuations	0	0
Harmonics	0	0

Clause 4(b) Remedial action taken for each provision:

Voltage Fluctuations

<i>Location</i>	<i>Action Taken</i>
	N/A

Harmonics

<i>Location</i>	<i>Action Taken</i>
	N/A

N/A = Not Applicable.

Continuous monitoring of voltage and frequency fluctuations is done at the substation busbar. Temporary power quality monitoring equipment is installed on the network for specific problem monitoring in response to a customer power quality complaint.

Clause 5 - Significant interruptions to small use customers.

<i>Clause Description</i>	<i>Total</i>
Clause 5(a) Number of premises that experienced interruptions greater than 12 hours continuous	1,663
Clause 5(b) Number of premises that experienced more than 16 interruptions.	101

Detailed analysis of interruptions where duration is greater than 12 hours.

<i>System</i>	<i>Duration (Minutes)</i>	<i>Premises</i>	<i>Start Date</i>	<i>Cause Description</i>	<i>Incident Category</i>
Beagle Bay	27337	1	30/11/2016	Unnecessary Attendance	Electric Shock
Bidyadanga	1068	1	09/01/2017	Unnecessary Attendance	Electric Shock
Bidyadanga	11310	1	22/05/2017	Wind or Wind Bourne Debris	No Power
Broome	86138	1	09/09/2016	Customer Installation or Appliance	Electric Shock
Broome	2374	1	17/12/2016	Customer Installation or Appliance	Electric Shock
Broome	1281	1	17/01/2017	Customer Installation or Appliance	No Power
Broome	769	1	19/01/2017	Unnecessary Attendance	Debris On Service Wire
Broome	4391	1	22/01/2017	Equipment Failure	Miscellaneous Hazard
Broome	1008	1	23/02/2017	Customer Installation or Appliance	Disconnect For Fault
Broome	4422	1	10/03/2017	Unknown	No Power
Broome	978	1	15/04/2017	Unnecessary Attendance	No Power
Broome	4175	1	28/04/2017	Equipment Failure	SFW PQI Voltage Fluctuation
Broome	7892	1	24/05/2017	Unnecessary Attendance	No Power
Broome	2326	1	20/06/2017	Customer Installation or Appliance	Electric Shock
Carnarvon	5844	1	01/08/2016	Equipment Failure	Miscellaneous Non Hazard
Carnarvon	821	2	20/08/2016	Equipment Failure	Feeder Trip
Carnarvon	1445	1	30/08/2016	Equipment Failure	No Power
Carnarvon	1408	1	30/08/2016	Equipment Failure	Part Power
Carnarvon	787	3	18/10/2016	Equipment Failure	Feeder Trip
Carnarvon	1489	1	16/01/2017	Equipment Failure	Miscellaneous Non Hazard

System	Duration (Minutes)	Premises	Start Date	Cause Description	Incident Category
Carnarvon	1357	5	02/02/2017	Lightning	Recloser Trip
Carnarvon	5623	1	03/02/2017	Equipment Failure	Drop Out Fuse Trip
Carnarvon	2938	1	26/02/2017	Unknown	SFW PQI Voltage Fluctuation
Carnarvon	1988	1	05/03/2017	Equipment Failure	Part Power
Carnarvon	1583	2	22/04/2017	Plan Outage or Disconnection	Planned HVN Incident
Carnarvon	1225	1	28/05/2017	Unnecessary Attendance	No Power
Carnarvon	1547	3	28/05/2017	Equipment Failure	Recloser Trip
Coral Bay	1086	1	28/06/2017	Plan Outage or Disconnection	No Power
Denham	974	27	11/12/2016	Plan Outage or Disconnection	Planned HVN Incident
Denham	1024	1	08/02/2017	Customer Installation or Appliance	No Power
Denham	2761	1	07/04/2017	Customer Installation or Appliance	No Power
Derby	1362	1	26/07/2016	Machine or Tool	Underground Cable Damaged
Derby	970	1	31/07/2016	Customer Installation or Appliance	No Power
Derby	1245	1	03/01/2017	Vegetation	No Power
Derby	1113	1	03/01/2017	Customer Installation or Appliance	Electric Shock
Derby	1235	1	04/01/2017	Customer Installation or Appliance	Electric Shock
Derby	5567	1	05/01/2017	Customer Installation or Appliance	Electric Shock
Derby	1148	1	30/01/2017	Vandalism or Willful Damage	No Power
Derby	21199	1	29/03/2017	Human Error	Electric Shock
Derby	758	1	05/05/2017	Unnecessary Attendance	Reconnection
Djarindjin	1313	1	28/07/2016	Equipment Failure	Dim Power
Djarindjin	1463	1	03/04/2017	Customer Installation or Appliance	No Power
Esperance	6058	1	22/07/2016	Vegetation	No Power
Esperance	763	1	02/08/2016	Equipment Failure	Intermittent Power
Esperance	785	2	28/09/2016	Wind or Wind Bourne Debris	Drop Out Fuse Trip
Esperance	18903	1	04/10/2016	Customer Installation or Appliance	Part Power
Esperance	1279	6	05/10/2016	Fire (Not Pole Top Fire)	Recloser Trip

System	Duration (Minutes)	Premises	Start Date	Cause Description	Incident Category
Esperance	1194	1	05/10/2016	Fire (Not Pole Top Fire)	Pole Down
Esperance	1442	1	08/11/2016	Unknown	Intermittent Power
Esperance	1400	1	08/11/2016	Unknown	Intermittent Power
Esperance	1490	1	15/11/2016	Equipment Failure	Recloser Trip
Esperance	843	1	29/11/2016	Bird	No Power
Esperance	1473	1	10/01/2017	Equipment Failure	No Power
Esperance	790	11	31/01/2017	Wind or Wind Bourne Debris	Recloser Trip
Esperance	1724	1	07/02/2017	Plan Outage or Disconnection	No Power
Esperance	2683	1	08/02/2017	Customer Installation or Appliance	Switch Isolation
Esperance	1136	1	20/02/2017	Lightning	No Power
Esperance	1180	2	20/02/2017	Lightning	Recloser Trip
Esperance	1055	4	20/02/2017	Lightning	Switch Isolation
Esperance	1644	1	17/03/2017	Equipment Failure	Miscellaneous Hazard
Esperance	4747	1	19/03/2017	Customer Installation or Appliance	Pole Broken/Damaged
Esperance	1044	159	05/04/2017	Vandalism or Willful Damage	Planned HVN Incident
Esperance	1039	1	05/04/2017	Unknown	No Power
Esperance	1093	1	07/04/2017	Equipment Failure	No Power
Esperance	1434	1	02/05/2017	Vehicle	Pole Leaning
Esperance	1320	1	10/05/2017	Machine or Tool	No Power
Esperance	1225	1	10/05/2017	Lightning	Part Power
Esperance	1628	1	13/05/2017	Water Infiltration or Flooded Equipment	No Power
Esperance	2506	1	23/06/2017	Equipment Failure	Part Power
Exmouth	7414	1	10/08/2016	Equipment Failure	Miscellaneous Hazard
Exmouth	11170	1	07/10/2016	Customer Installation or Appliance	Part Power
Exmouth	3433	1	20/10/2016	Unnecessary Attendance	Low Hanging Service Wire
Exmouth	1807	1	27/10/2016	Customer Installation or Appliance	Miscellaneous Hazard
Exmouth	1497	1	22/01/2017	Human Error	Underground Cable Damaged

System	Duration (Minutes)	Premises	Start Date	Cause Description	Incident Category
Exmouth	2844	1	12/02/2017	Unknown	Part Power
Exmouth	3158	1	12/06/2017	Unnecessary Attendance	Dim Power
Fitzroy Crossing	1252	1	15/11/2016	Customer Installation or Appliance	No Power
Fitzroy Crossing	1309	147	02/12/2016	Generation Failure	Feeder Trip
Fitzroy Crossing	1276	178	02/12/2016	Generation Failure	Feeder Trip
Fitzroy Crossing	1338	85	02/12/2016	Generation Failure	Feeder Trip
Fitzroy Crossing	1385	2	02/12/2016	Generation Failure	No Power
Fitzroy Crossing	1266	68	02/12/2016	Generation Failure	Feeder Trip
Fitzroy Crossing	1239	1	29/03/2017	Customer Installation or Appliance	Reconnection
Fitzroy Crossing	1601	1	19/04/2017	Lightning	No Power
Fitzroy Crossing	996	1	19/04/2017	Customer Installation or Appliance	Electric Shock
Halls Creek	1134	1	18/10/2016	Plan Outage or Disconnection	Part Power
Halls Creek	7335	1	28/10/2016	External Owner Equipment	No Power
Hopetoun	17212	1	22/07/2016	Customer Installation or Appliance	Reconnection
Hopetoun	1134	1	28/07/2016	Equipment Failure	Part Power
Hopetoun	4238	1	18/11/2016	Equipment Failure	No Power
Hopetoun	3928	1	18/11/2016	Human Error	Underground Dome Damaged
Hopetoun	1289	1	08/02/2017	Customer Installation or Appliance	Part Power
Hopetoun	9978	1	10/02/2017	Equipment Failure	Low Hanging Service Wire
Hopetoun	7315	1	11/02/2017	Equipment Failure	Part Power
Hopetoun	5635	1	11/02/2017	Equipment Failure	No Power
Hopetoun	5622	1	11/02/2017	Equipment Failure	No Power
Hopetoun	2803	12	13/02/2017	Lightning	Recloser Trip
Hopetoun	2748	1	13/02/2017	Unknown	No Power
Hopetoun	3025	1	13/02/2017	Unknown	SFW PQI Voltage Fluctuation
Hopetoun	3190	1	14/02/2017	Equipment Failure	Part Power
Hopetoun	1469	1	15/02/2017	Equipment Failure	Part Power

System	Duration (Minutes)	Premises	Start Date	Cause Description	Incident Category
Hopetoun	1486	2	16/02/2017	Water Infiltration or Flooded Equipment	Drop Out Fuse Trip
Hopetoun	3010	1	10/05/2017	PQI - Default Code	SFW PQI Low Volts
Hopetoun	1822	1	24/05/2017	Equipment Failure	SFW PQI Voltage Fluctuation
Kalumburu	1250	1	09/12/2016	Unknown	Part Power
Kalumburu	1242	1	09/12/2016	Unknown	Part Power
Karratha	1385	1	26/09/2016	Unnecessary Attendance	No Power
Karratha	810	1	26/01/2017	Lightning	SFW PQI Voltage Fluctuation
Karratha	1308	2	27/01/2017	Lightning	Recloser Trip
Karratha	1283	3	06/02/2017	Equipment Failure	Drop Out Fuse Trip
Karratha	978	11	06/02/2017	Lightning	Feeder Trip
Karratha	1316	1	06/02/2017	Lightning	LV Fuse Trip
Karratha	17086	1	08/02/2017	Equipment Failure	No Power
Karratha	1141	1	09/02/2017	Equipment Failure	Part Power
Karratha	1188	1	19/02/2017	Equipment Failure	Underground Cable Damaged
Karratha	4623	1	21/02/2017	Customer Installation or Appliance	No Power
Karratha	4676	9	12/03/2017	Lightning	Switch Isolation
Karratha	1209	505	14/03/2017	Equipment Failure	Feeder Trip
Karratha	1215	1	18/03/2017	Equipment Failure	Part Power
Karratha	10127	2	23/03/2017	Plan Outage or Disconnection	Planned HVN Incident
Karratha	1680	1	16/05/2017	Vehicle	Pole Hit
Kununurra	3481	2	01/08/2016	Plan Outage or Disconnection	Planned HVN Incident
Kununurra	1440	1	30/08/2016	Unnecessary Attendance	No Power
Kununurra	1610	1	15/11/2016	Vegetation	Disconnect For Fault
Kununurra	3076	1	12/12/2016	Customer Installation or Appliance	Disconnect For Fault
Kununurra	4453	1	26/12/2016	Equipment Failure	Part Power
Kununurra	799	1	09/01/2017	Vegetation	Debris On Street Wire
Kununurra	1063	2	09/02/2017	Animal	Recloser Trip

System	Duration (Minutes)	Premises	Start Date	Cause Description	Incident Category
Kununurra	3975	1	14/02/2017	Equipment Failure	No Power
Kununurra	1440	1	07/06/2017	Vandalism or Willful Damage	No Power
Laverton	1588	1	10/08/2016	Customer Installation or Appliance	Electric Shock
Laverton	1211	1	16/08/2016	Equipment Failure	Pole Leaning
Laverton	722	6	04/02/2017	Unknown	Recloser Trip
Laverton	11711	1	08/02/2017	Equipment Failure	Reconnection
Leonora	2419	1	25/12/2016	Lightning	No Power
Leonora	1084	1	16/02/2017	Customer Installation or Appliance	No Power
Leonora	1479	1	15/03/2017	Customer Installation or Appliance	No Power
Marble Bar	5844	1	29/01/2017	Customer Installation or Appliance	No Power
Marble Bar	1285	1	05/02/2017	Customer Installation or Appliance	Part Power
Marble Bar	21892	1	09/02/2017	Unnecessary Attendance	SFW PQI Voltage Fluctuation
Marble Bar	21888	1	09/02/2017	Unnecessary Attendance	SFW PQI Voltage Fluctuation
Marble Bar	21887	1	09/02/2017	Unnecessary Attendance	SFW PQI Voltage Fluctuation
Marble Bar	21886	1	09/02/2017	Unnecessary Attendance	SFW PQI Voltage Fluctuation
Marble Bar	1349	1	23/02/2017	Customer Installation or Appliance	Part Power
Marble Bar	1419	1	03/04/2017	Lightning	Part Power
Menzies	4379	1	08/08/2016	Vehicle	Pole Hit
Menzies	1606	1	17/10/2016	Equipment Failure	No Power
Norseman	1450	1	07/02/2017	Equipment Failure	Disconnect For Fault
Onslow	872	55	21/04/2017	Generation Failure	Feeder Trip
Port Hedland	730	1	01/07/2016	Vehicle	Underground Dome Damaged
Port Hedland	793	1	02/12/2016	Customer Installation or Appliance	No Power
Port Hedland	1235	20	31/03/2017	Equipment Failure	LV Fuse Trip
Port Hedland	960	18	05/04/2017	Equipment Failure	LV Fuse Trip
Port Hedland	2399	1	08/04/2017	Customer Installation or Appliance	Part Power
Port Hedland	1149	1	15/05/2017	Unnecessary Attendance	No Power

System	Duration (Minutes)	Premises	Start Date	Cause Description	Incident Category
Port Hedland	10051	1	31/05/2017	Plan Outage or Disconnection	No Power
Port Hedland	1435	1	21/06/2017	Unnecessary Attendance	No Power
Port Hedland	942	1	22/06/2017	Equipment Failure	Equipment Fire (Not Pole)
Sandstone	999	1	09/02/2017	Customer Installation or Appliance	SFW PQI Voltage Fluctuation
Wiluna	916	46	05/10/2016	Vehicle	Feeder Trip
Wiluna	2980	1	27/04/2017	Wind or Wind Bourne Debris	Disconnect For Fault
Wyndham	1678	1	28/07/2016	External Owner Equipment	No Power
Wyndham	3910	1	26/02/2017	Unknown	SFW PQI Voltage Fluctuation
Wyndham	742	1	28/02/2017	Lightning	No Power
Wyndham	1066	1	28/02/2017	Lightning	No Power
Wyndham	1197	1	13/03/2017	Equipment Failure	No Power
Wyndham	7590	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7567	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7564	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7559	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7557	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7553	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7543	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7540	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7537	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7521	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7524	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7522	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7515	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7510	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7505	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7497	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation

System	Duration (Minutes)	Premises	Start Date	Cause Description	Incident Category
Wyndham	7491	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7489	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	7484	1	17/03/2017	PQI - Default Code	SFW PQI Voltage Fluctuation
Wyndham	971	2	25/03/2017	Equipment Failure	Drop Out Fuse Trip
Wyndham	1001	1	25/03/2017	Equipment Failure	No Power
Wyndham	1446	1	21/06/2017	Unnecessary Attendance	SFW PQI Voltage Fluctuation
Yunggora	20528	49	23/12/2016	Water Infiltration or Flooded Equipment	LV Fuse Trip
Yunggora	6189	56	23/12/2016	Water Infiltration or Flooded Equipment	Feeder Trip
		1,663	Number of Interruptions = 190		

Customer interruptions greater than 12 hours that were largely due to significant events (cyclones, severe storms, fire & floods) that Horizon Power systems experienced in 2016/17.

- Fitzroy Crossing Fire (Dec 2016)
- Yunggora Flooding – residual from Cyclone Yvette (Dec 2016)
- Bidyadanga Storms (Mar 2017)

Clause 6 and 10 - Total number of complaints received

2015/16	2016/17 (#Customer PQ)
34	111 (41)

Clause 7 and 10 - Number of customer complaints in each discrete area:

<i>Discrete Area</i>	<i>2015/16</i>	<i>2016/17 (#Customer PQ Complaint)</i>
NWIS	6	14 (8)
Ardyaloon		
Beagle Bay		
Bidyadanga		2
Broome	5	16 (3)
Carnarvon	4	7 (2)
Coral Bay		
Cue		
Denham	1	1 (1)
Derby	1	
Djarindjin		
Esperance	9	14 (8)
Exmouth	1	8 (5)
Fitzroy Crossing	1	1
Gascoyne Junction		
Halls Creek	2	1 (1)
Hopetoun	1	7 (6)
Kalumburu		
Kununurra	1	9 (4)
Lake Argyle		
Laverton		
Leonora		
Looma		
Marble Bar		
Meekatharra	1	1
Menzies		1 (1)
Mount Magnet		1 (1)
Norseman	1	1 (1)
Nullagine		
Onslow		2
Sandstone		
Warmun		
Wiluna		
Wyndham		25
Yalgoo		
Yungngora		
Horizon Power Total	34	111 (41)

Horizon Power had an initiative to identify Neutral Integrity issues on the network. Initially, the criteria was very strict. Consequently a high number of Power Quality Investigations were raised internally as opposed to Customer raised Power Quality Complaints. This resulted in a spike in the number of Power Quality Investigations during February and March. The process was refined in April resulting in the normalisation of the quantity of Power Quality Investigations.

Clause 8 and 10 - Total amount spent addressing complaints.

2015/16	2016/17
\$595,064	\$1,647,756

Clause 9 and 10 - Payments to customers for failure to meet certain standards

The number and total payments made to customers for failure to give required notice of planned interruption.

2015/16		2016/17	
Number	Cost	Number	Cost
6	\$120	1	\$20

The number and total payments made to customers for supply interruptions exceeding 12 hours.

2015/16		2016/17	
Number	Cost	Number	Cost
17	\$1,360	346	\$27,680

There were 3 major outages greater than 12 hours as listed below.

- Fitzroy Crossing (Fire)
- Yungngora (Flooding)
- Karratha (Blown Ring Main Unit)

Clause 11(a), 12 and 13 - Average Length of Interruption of Supply to Customer Premises in Minutes

System	2013/14	2014/15	2015/16	2016/17	Average
NWIS ¹	164.04	62.99	64.89	91.22	95.78
Ardyaloon	113.00	74.94	38.54	18.98	61.36
Beagle Bay	38.15	20.38	85.60	217.17	90.32
Bidyadanga	52.29	24.54	261.48	183.69	130.50
Broome	52.25	146.23	68.69	56.60	80.94
Carnarvon	35.54	287.83	85.07	101.75	127.55
Coral Bay	0.00	3.30	438.14	67.00	127.11
Cue	32.45	83.28	85.15	109.19	77.52
Denham	26.32	96.58	44.38	137.26	76.13
Derby	54.94	83.10	70.05	77.37	71.37
Djarindjin	0.00	74.34	113.91	0.00	47.06
Esperance	88.41	69.07	106.90	74.56	84.74
Exmouth	74.29	1423.22	115.84	72.64	421.50
Fitzroy Crossing	45.70	200.78	30.54	805.04	270.52
Gascoyne Junction	90.00	29.51	18.60	35.40	43.38
Halls Creek	54.82	248.83	102.02	121.59	131.81
Hopetoun	100.71	104.72	140.62	232.25	144.57
Kalumburu	105.64	55.85	180.50	101.76	110.94
Kununurra	37.97	46.39	53.28	60.83	49.62
Lake Argyle	125.50	0.00	97.50	201.80	106.20
Laverton	132.73	73.90	168.28	149.89	131.20
Leonora	50.55	35.50	82.20	92.67	65.23
Looma	163.34	63.86	129.97	134.64	122.95
Marble Bar	87.91	84.38	15.35	40.80	57.11
Meekatharra	97.50	127.61	27.59	162.09	103.70
Menzies	58.06	0.00	53.00	176.86	71.98
Mount Magnet	24.21	19.56	9.95	52.03	26.44
Norseman	102.46	160.57	63.46	142.71	117.30
Nullagine	111.81	189.95	0.00	0.00	75.44
Onslow	37.59	97.08	77.20	93.05	76.23
Sandstone	12.63	27.22	0.00	178.64	54.62
Warmun	28.72	93.61	5.78	238.24	91.59
Wiluna	125.04	129.45	4.53	313.13	143.04
Wyndham	36.54	122.41	122.36	23.46	76.19
Yalgoo	278.67	17.41	80.21	2.00	94.57
Yungngora	47.31	22.73	58.34	1564.05	423.11
Horizon Power Total	81.90	161.00	79.83	90.94	103.42

¹NWIS – North West Interconnected System as per Clause 1

Clause 11(b), 12 and 13 - Average Number of Interruptions of Supply to Customer Premises

System	2013/14	2014/15	2015/16	2016/17	Average
NWIS ¹	3.03	1.20	0.83	0.74	1.45
Ardayaloon	0.61	2.49	3.17	1.40	1.92
Beagle Bay	1.35	1.39	1.26	0.05	1.01
Bidyadanga	2.15	2.41	2.07	3.93	2.64
Broome	1.91	0.29	5.29	0.80	2.07
Carnarvon	6.61	11.15	2.56	4.64	6.24
Coral Bay	0.00	1.00	1.75	0.10	0.71
Cue	2.04	6.01	2.25	3.11	3.35
Denham	3.93	10.91	7.10	2.28	6.06
Derby	5.62	4.37	2.91	1.65	3.64
Djarindjin	0.00	2.88	0.95	0.00	0.96
Esperance	3.40	4.03	6.65	4.40	4.62
Exmouth	2.07	3.44	2.08	4.60	3.05
Fitzroy Crossing	0.41	0.42	2.37	1.29	1.12
Gascoyne Junction	0.15	0.88	1.21	1.63	0.97
Halls Creek	1.40	1.17	1.62	1.37	1.39
Hopetoun	4.55	2.58	2.08	0.64	2.46
Kalumburu	2.08	5.19	3.19	5.60	4.01
Kununurra	17.62	10.75	11.33	10.57	12.56
Lake Argyle	2.03	0.00	1.88	2.80	1.68
Laverton	0.94	0.44	1.69	4.36	1.86
Leonora	2.28	5.93	3.76	3.79	3.94
Looma	2.30	4.32	1.37	0.40	2.10
Marble Bar	1.80	0.95	8.27	3.68	3.68
Meekatharra	3.17	1.71	1.46	0.02	1.59
Menzies	1.79	0.00	0.39	1.24	0.85
Mount Magnet	7.77	1.87	2.88	7.76	5.07
Norseman	2.60	4.13	2.88	1.37	2.74
Nullagine	0.91	0.44	0.00	0.00	0.34
Onslow	8.19	4.71	7.32	8.66	7.22
Sandstone	1.00	1.08	0.00	1.35	0.86
Warmun	0.81	2.75	0.96	0.67	1.30
Wiluna	3.17	1.25	0.84	1.51	1.69
Wyndham	6.26	0.29	3.86	3.91	3.58
Yalgoo	1.50	0.95	1.15	0.35	0.99
Yungngora	11.73	3.99	4.53	6.65	6.73
Horizon Power Total	4.09	3.11	3.55	2.58	3.33

¹NWIS – North West Interconnected System as per Clause 1

Clause 11(c), 12 and 13 - Average Percentage Of Time That Electricity Has Been Supplied To Customer Premises.

System %	2013/14	2014/15	2015/16	2016/17	Average
NWIS ¹	99.97	99.97	99.99	99.98	99.98
Ardayaloon	99.98	99.98	99.99	100.00	99.99
Beagle Bay	99.99	99.99	99.98	99.96	99.98
Bidyadanga	99.99	99.99	99.95	99.97	99.97
Broome	99.99	99.99	99.99	99.99	99.99
Carnarvon	99.99	99.99	99.98	99.98	99.99
Coral Bay	100.00	100.00	99.92	99.99	99.98
Cue	99.99	99.99	99.98	99.98	99.99
Denham	99.99	99.99	99.99	99.97	99.99
Derby	99.99	99.99	99.99	99.99	99.99
Djarindjin	100.00	100.00	99.98	100.00	99.99
Esperance	99.98	99.98	99.98	99.99	99.98
Exmouth	99.99	99.99	99.98	99.99	99.98
Fitzroy Crossing	99.99	99.99	99.99	99.85	99.96
Gascoyne Junction	99.98	99.98	100.00	99.99	99.99
Halls Creek	99.99	99.99	99.98	99.98	99.98
Hopetoun	99.98	99.98	99.97	99.96	99.97
Kalumburu	99.98	99.98	99.97	99.98	99.98
Kununurra	99.99	99.99	99.99	99.99	99.99
Lake Argyle	99.98	99.98	99.98	99.96	99.97
Laverton	99.97	99.97	99.97	99.97	99.97
Leonora	99.99	99.99	99.98	99.98	99.99
Looma	99.97	99.97	99.98	99.97	99.97
Marble Bar	99.98	99.98	100.00	99.99	99.99
Meekatharra	99.98	99.98	99.99	99.97	99.98
Menzies	99.99	99.99	99.99	99.97	99.98
Mount Magnet	100.00	100.00	100.00	99.99	99.99
Norseman	99.98	99.98	99.99	99.97	99.98
Nullagine	99.98	99.98	100.00	100.00	99.99
Onslow	99.99	99.99	99.99	99.98	99.99
Sandstone	100.00	100.00	100.00	99.97	99.99
Warmun	99.99	99.99	100.00	99.95	99.99
Wiluna	99.98	99.98	100.00	99.94	99.97
Wyndham	99.99	99.99	99.98	100.00	99.99
Yalgoo	99.95	99.95	99.98	100.00	99.97
Yungngora	99.99	99.99	99.99	99.70	99.92
Horizon Power Total	99.98	99.98	99.98	99.98	99.98

¹NWIS – North West Interconnected System as per Clause 1

Clause 11(d), 12 and 13 - Average Total Length of All Interruptions of Supply to Customer Premises in Minutes

System	2013/14	2014/15	2015/16	2016/17	Average
NWIS ¹	496	76	54	68	173
Ardyaloon	69	186	122	27	101
Beagle Bay	52	28	108	10	49
Bidyadanga	112	59	540	721	358
Broome	100	43	364	45	138
Carnarvon	235	3209	217	472	1033
Coral Bay	0	3	767	6	194
Cue	66	500	192	339	274
Denham	104	1054	315	313	446
Derby	309	363	204	127	251
Djarindjin	0	214	109	0	81
Esperance	300	278	711	328	404
Exmouth	154	4903	241	334	1408
Fitzroy Crossing	19	85	72	1038	303
Gascoyne Junction	14	26	23	58	30
Halls Creek	77	292	166	166	175
Hopetoun	458	270	292	148	292
Kalumburu	219	290	576	569	414
Kununurra	669	499	603	643	603
Lake Argyle	255	0	183	565	251
Laverton	125	33	284	653	274
Leonora	115	211	309	351	246
Looma	375	276	178	54	221
Marble Bar	158	80	127	150	129
Meekatharra	309	218	40	4	143
Menzies	104	0	21	219	86
Mount Magnet	188	37	29	404	164
Norseman	267	663	182	195	327
Nullagine	102	84	0	0	46
Onslow	308	457	565	806	534
Sandstone	13	29	0	242	71
Warmun	23	257	6	160	111
Wiluna	396	162	4	474	259
Wyndham	229	35	472	92	207
Yalgoo	418	17	92	1	132
Yungngora	555	91	265	10403	2828
Horizon Power Total	335	501	284	234	338

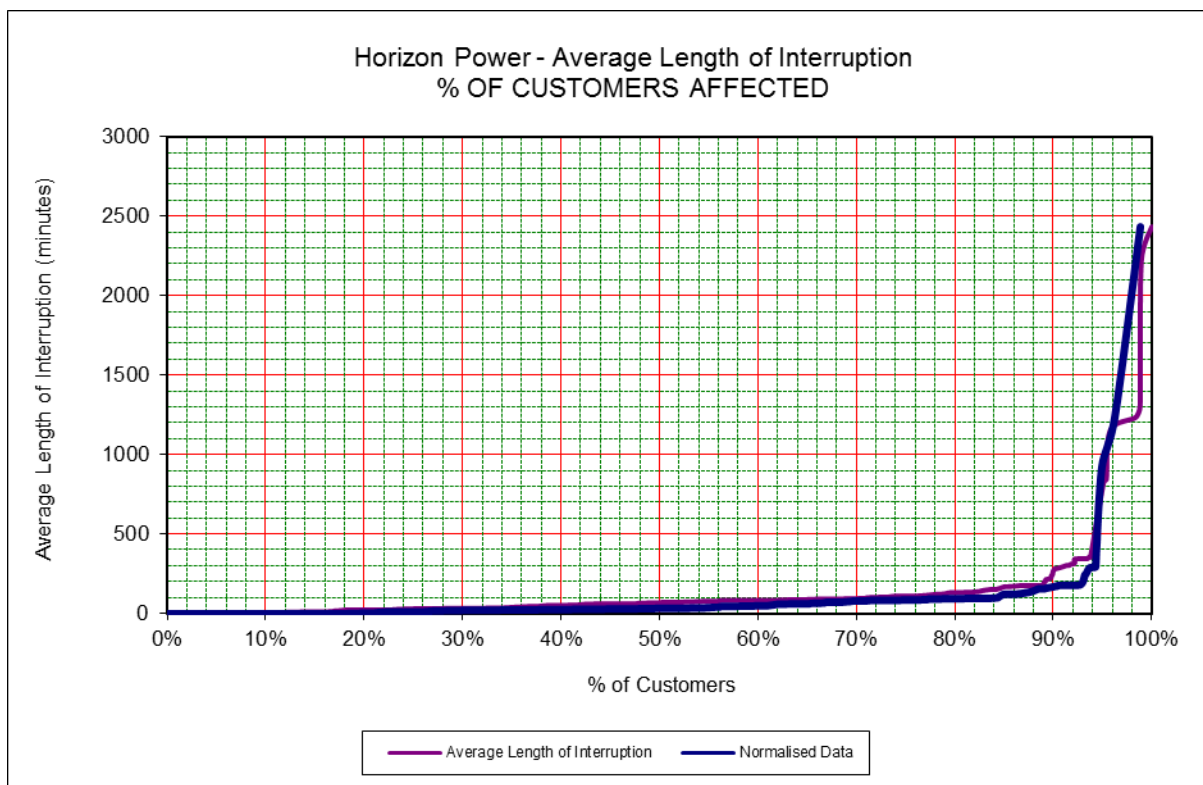
For the period 01/07/2016 to 30/06/2017 SAIDI was **126** minutes using the Normalised data sets.

¹NWIS – North West Interconnected System as per Clause 1

Clause 14(a) - Horizon Power - Average Length of Interruption - Frequency Distribution

<i>Percentile</i>	<i>Minutes</i>
25 th	31.77
50 th	71.07
75 th	111.55
90 th	270.97
95 th	796.14
98 th	1223.19
100 th	2429.67

Clause 15 – Average Length of Interruption - Frequency Graph.

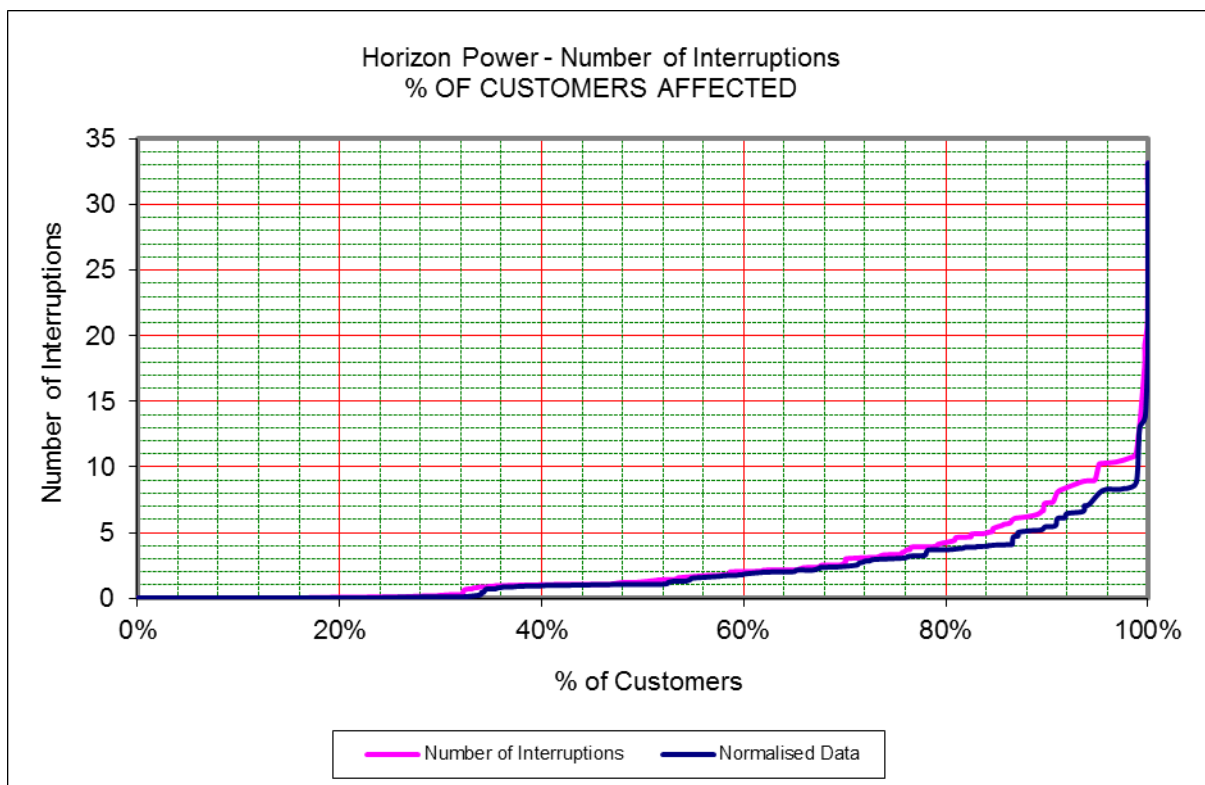


During the period 01/07/2016 to 30/06/2017 of those customers who experienced an interruption, 62% had an interruption of less than 60 minutes.

Clause 14(b) - Horizon Power - Number of Interruptions - Frequency Distribution

<i>Percentile</i>	<i>Interruptions</i>
25 th	0.09
50 th	1.24
75 th	3.32
90 th	7.24
95 th	9.65
98 th	10.64
100 th	33.19

Clause 15 – Number of Interruptions - Frequency Graph.

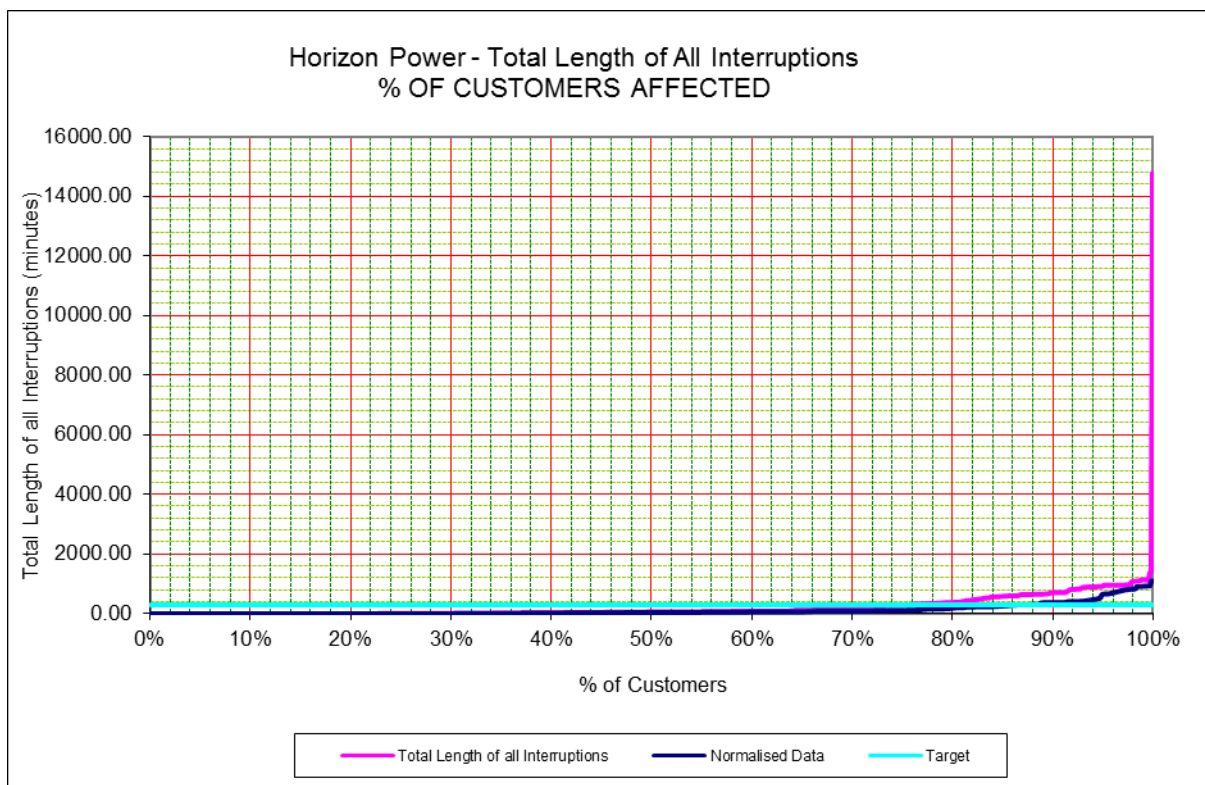


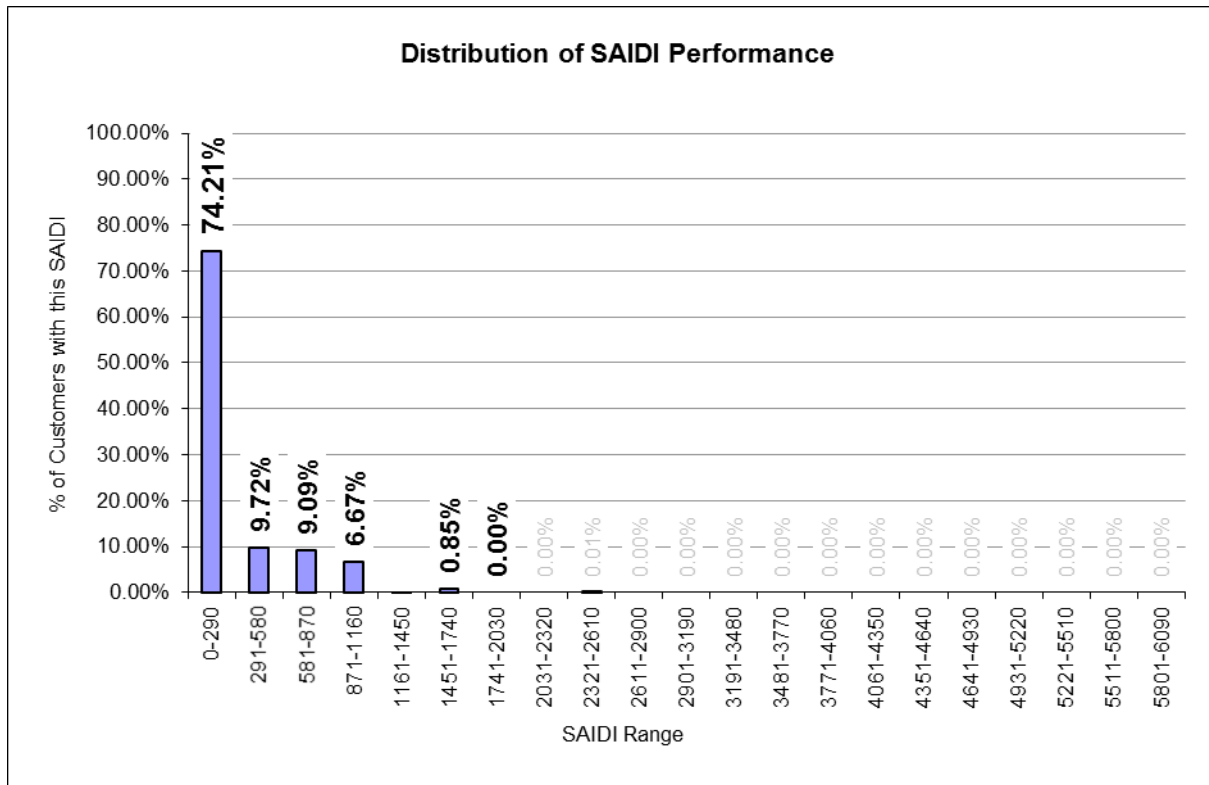
During the period 01/07/2016 to 30/06/2017, 99.2% of customers experienced an average of less than 16 outages or less.

Clause 14(c) - Horizon Power - Total Length of all Interruptions - Frequency Distribution

<i>Percentile</i>	<i>Minutes</i>
25 th	12.29
50 th	66.58
75 th	290.76
90 th	711.72
95 th	927.24
98 th	1085.83
100 th	14786.66

Clause 15 – Total Length of all Interruptions - Frequency Graph





During the period 01/07/2016 to 30/06/2017, 74% of customers experienced outages with durations of less than 290 minutes. Using a normalised data set this is increased to 86%.

4. MAJOR EVENT DAYS

In the period 01/07/2016 to 30/06/2017 there were 3 significant events for which Major Event Days were recorded.

Power System	Major Event Day Dates	Event
Fitzroy Crossing	2 December 2016	Fire
Yungngora	23 - 27 December 2016	Flooding
Bidyadanga	17 March 2017	Storms

5. APPENDIX

Major Event Days

Major event days are days in which interruptions affect the delivery of supply in a system and are not reasonably practicable to control such as extreme weather events (cyclones, fires and floods). These days are excluded from Sustained Interruptions used for reliability measurement and reporting.

This report makes reference to the impact of major event days where they have had a significant impact on the statistics.

Major Event Day Classification

The classification of Major Event Days is to allow major events to be studied separately from daily operation, and in the process, to better reveal trends in daily operation that would be hidden by the large statistical effect of major events.

A Major Event Day is a day in which interruptions affect the delivery of supply in a system that is not reasonably practicable to control. All indices are calculated based on removal of the identified Major Event Days.

Interruptions that span multiple days are accrued to the day on which the interruption begins.

Normalised Data Sets - Unplanned

Horizon Power uses Normalised data sets to measure the management of incidents that are within the business' control.

Sustained Interruptions in Horizon Powers systems are those interruptions that result in a loss of electricity to customers for more than one minute in duration.

Horizon Power excludes interruptions from its Normalised data set where the interruption is not reasonably practicable to control such as:

- Customer installations/ appliances
- Planned outages/ disconnections
- Vehicle, machine or tool damage
- Wilful damage
- Damage due to events that Horizon Power cannot, so far as is reasonably practicable, control such as cyclones, fires and floods.

As Horizon Power is a vertically integrated business (responsible for generation, transmission and distribution) reliability data includes generation and transmission outages.

Normalised data sets exclude incidents that aren't reasonably practicable to control by Horizon Power.

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