APPENDIX 4.7

Energex revised reliability program

Energex

Revised Reliability Program

Revised Regulatory Proposal

Asset Management Division

energex

positive energy

Energex

Revised Reliability Program 2015/16 - 2019/20

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Version control

Version	Date	Description
1	26/06/15	For submission with revised regulatory proposal

Energex Limited (Energex) is a Queensland Government Owned Corporation that builds, owns, operates and maintains the electricity distribution network in the growing region of South East Queensland. Energex provides distribution services to almost 1.4 million domestic and business connections, delivering electricity to a population base of around 3.2 million people.

Energex's key focus is distributing safe, reliable and affordable electricity in a commercially balanced way that provides value for its customers, manages risk and builds a sustainable future.

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Executive Summary

Energex's regulatory proposal included a program targeted at addressing feeders that meet the worst performer feeder criteria set out in Energex's Distribution Authority.

From 1 July 2014 Energex has had a legislative requirement under the Distribution Authority to implement a program to improve the reliability on the worst performing 11 kV feeders based on the following criteria:

- The 11 kV feeder is in the worst 10% of the networks 11 kV feeders based on its three year average SAIDI/SAIFI performance; and
- The 11 kV feeder's SAIDI/SAIFI outcome is 150% or more of the MSS SAIDI/SAIFI limit applicable to that category of 11 kV feeder.

In its preliminary decision the AER did not accept Energex's proposed reliability expenditure forecast and reduced the forecast by 65 per cent. In doing so the AER raised a number of issues that Energex has attempted to address in this document.

Energex believes that its revised reliability expenditure is the minimum requirement to comply with its Distribution Authority. Energex has reviewed its proposed reliability expenditure taking into account issues raised by the AER's preliminary decision. Energex's revised reliability capex provided below represents a 32 per cent reduction from Energex's regulatory proposal.

Table 1 – Revised reliability capex

$m, 2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Energex original proposal	14.6	11.0	11.0	11.1	11.2	58.9
AER preliminary decision	5.1	3.9	3.9	3.9	3.9	20.6
Energex revised proposal	**10.8**	**7.2**	**7.2**	**7.3**	**7.3**	**39.9**

Energex engaged Aurecon to review its revised reliability capex forecast. Aurecon analysed the performance data of Energex's worst performing feeders over the last five years, as well as its reliability expenditure in the current regulatory control period. Based on this analysis Aurecon have concluded that Energex's revised reliability capex is the minimum required to comply with the obligations in its Distribution Authority.

Contents

1 Energex's Regulatory Proposal

Energex's regulatory proposal included a program targeted at addressing feeders that meet the worst performer feeder criteria set out in Energex's Distribution Authority.

This program addresses the poor network performance experienced by customers on feeders where there would otherwise be no economic incentive to improve reliability through the AER's Service Target Performance Incentive Scheme (STPIS).

The program targets approximately 4% of Energex's rural feeder population and 0.3% of the urban feeder population per annum and typically does not materially improve average network performance.

2 Customer feedback

In not accepting Energex's proposed reliability expenditure forecast the AER observed that Energex's average network reliability has been steadily improving over the current regulatory period and that network performance against the minimum service standard has also improved.

Energex also acknowledges that a number of stakeholder submissions questioned the need to for reliability expenditure noting that average reliability has improved and that Energex is meeting its Minimum Service Standards.

However, Energex's customer research shows that customers on poor performing feeders are less satisfied with the current level of supply provided compared to customers on "average" feeders. During the "Connecting with you" program customer feedback indicated that:

- 34 per cent of customers on a feeder with lower supply performance felt there should be an increase in network investment, relating to the frequency of outages, as opposed to 14 per cent within an average supply area.
- 27 per cent of customers on a feeder with lower supply quality felt there should be an increase in network investment relating to the duration of outages, as opposed to 16 per cent within an average supply area.

3 Jurisdictional Requirements

The requirement to monitor worst performing feeders and report on their performance in its annual Network Management Plan was an outcome from the 2004 Electricity Distribution and Service Delivery Review and subsequently included in the Queensland Electricity Industry Code.

In 2013 the Independent Review Panel on Network Costs recommended the Energex continue to monitor worst performing feeders and report on their performance in its annual report and the Distribution Annual Planning Report (Recommendation 9).

From 1 July 2014 Energex has had a legislative requirement under the Distribution Authority to implement a program to improve the reliability on the worst performing 11 kV feeders based on the following criteria:

- The 11 kV feeder is in the worst 10% of the networks 11 kV feeders based on its three year average SAIDI/SAIFI performance; and
- The 11 kV feeder's SAIDI/SAIFI outcome is 150% or more of the MSS SAIDI/SAIFI limit applicable to that category of 11 kV feeder.

The purpose of the improvement programs is to enable customers with the worst reliability outcomes to benefit from tailored network improvements.

Figure 1 and Figure 2 indicate the three year average rural and urban feeder SAIDI performance illustrating how the worst performing feeder criteria compares to the MSS average.

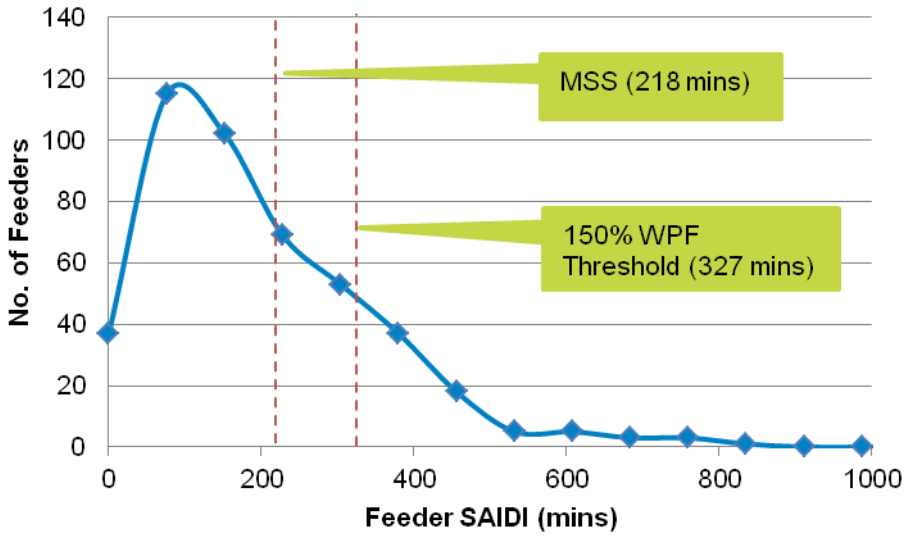

Figure 1 – 3 year average rural feeder SAIDI distribution (2013-14)

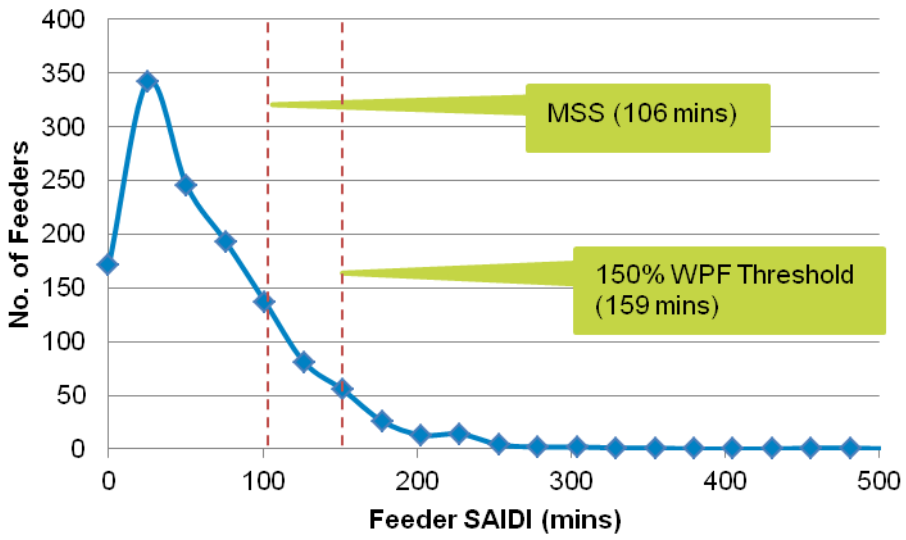

Figure 2 – 3 year average urban feeder SAIDI distribution (2013-14)

4 Feeder Selection Process

In its preliminary decision the AER stated that *"a small number of feeders appeared to perform better than the minimum service standard on average"* and that *"Energex did not remove isolated trends or events from the calculation of average three year SAIDI".*

Energex has reviewed its worst performing feeder forecast and confirms that the feeders identified all comply with the worst performing feeder criteria of the Distribution Authority criteria. The improvement plan is based on a thorough examination of the feeders' characteristics and the underlying reasons for their poor performance.

In preparing its proposed reliability expenditure forecast Energex reviewed all of the 2013-14 worst performing feeders and prioritised expenditure based on the average SAIDI performance over three years. In some cases, specific one-off causes have been identified which require no further action. This process resulted in the proposed worst performing program which aims to address 110 feeders over five years. This equates to approximately 4% of Energex's rural feeder population and 0.3% of the urban feeder population per annum.

Energex believes that this is the minimum requirement to comply with its Distribution Authority. Details of the recent SAIDI performance of the feeders selected for improvement projects for inclusion in the 2015-16 program of work are provided in Table 2.

Table 2 – List of 2015-16 Worst Performing Feeder Projects

Feeder	Zone Substation	Category	2011/12 SAIDI (mins)	2012/13 SAIDI (mins)	2013/14 SAIDI (mins)	3 Yr Avg SAIDI (mins)	% of MSS Limit
SIS2	Stradbroke Island	Short Rural	828	230	1282	780	358%
MTB15A	Mt Tamborine	Short Rural	804	376	659	613	281%
MGP13A	Mudgeeraba Package	Short Rural	772	370	679	607	278%
RWD1	Rosewood	Short Rural	265	195	1279	580	266%
GBN4	Goomboorian	Short Rural	48	684	827	520	239%
RLB16A	Redland Bay	Short Rural	258	815	205	426	195%
JBB16A	Jimboomba	Short Rural	264	437	517	406	186%
IPL3	Innisplain	Short Rural	635	250	316	401	184%
NBR15A	Nambour	Short Rural	380	535	252	389	178%
TGW2	Toogoolawah	Short Rural	236	700	231	389	178%
AMR3	Amamoor	Short Rural	569	361	180	370	170%
MBG4	Marburg	Short Rural	302	107	696	368	169%
LLY4	Laidley	Short Rural	259	284	529	357	164%
YDA1B	Yandina	Short Rural	193	498	369	354	162%
GYGGYS6	Gympie South	Short Rural	530	204	310	348	160%
KCY5	Kilcoy	Short Rural	47	499	490	345	158%
TBV3	Tamborine Village	Short Rural	N/A[1]	546	456	334	153%
PWC4	Palmwoods Central	Short Rural	516	271	213	333	153%
MMC19B	Merrimac	Urban	99	194	561	285	269%
CPL26A	Coopers Plains	Urban	151	157	334	214	202%
TWG18	Toowong	Urban	147	30	334	170	160%
CPR7	Coorparoo	Urban	14	190	291	165	156%

[1] TBV3 was first commissioned in July 2012 and therefore did not exist in 2011/12

5 Trends

A trend of average SAIDI performance of the WPF was provided in Energex Response EGX051 (Reliability) and is also provided in the graphs below, along with MSS SAIDI performance in each year. These trends show that average SAIDI performance of the WPFs has been relatively stable over the last five years. There is no correlation between "overall" network performance and performance of WPF in any given year.

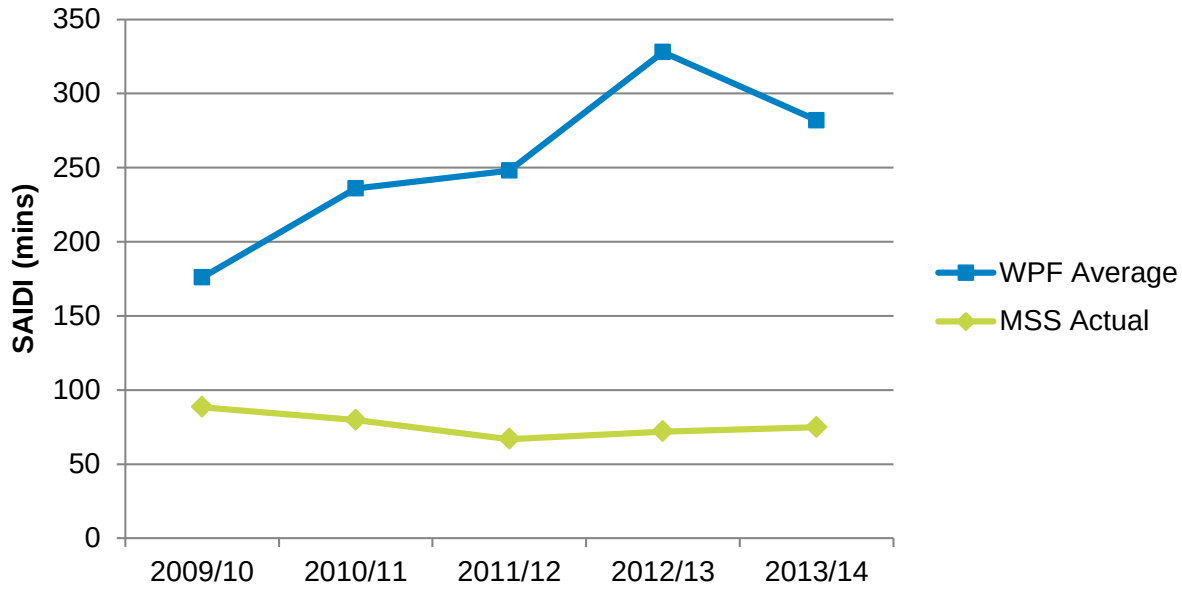

Figure 3 – Urban Worst Performing Feeder Average SAIDI

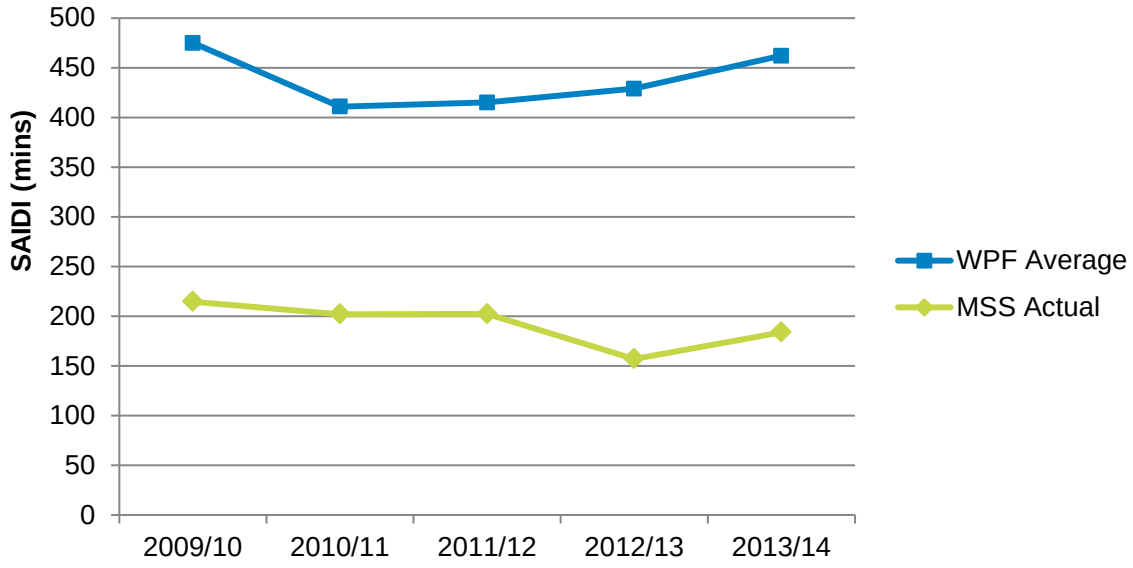

Figure 4 – Short Rural Worst Performing Feeder Average SAIDI

In its preliminary decision the AER raised concerns that in identifying the proposed worst performing feeders, Energex did not remove isolated trends or events from the calculation of average three year SAIDI. However as outlined in EGX010 (Augmentation and Connections), improving trends and “one-off” events are considered by Energex when determining whether a reliability improvement project is required on a WPF.

The AER has stated that some proposed projects could be deferred or be adjusted for greater risk tolerance and timing. However, deferral of any worst performing feeder projects will result in customers on these feeders receiving continued unacceptable levels of reliability. Customer research supports the need for reliability expenditure on worst performing feeders and Energex believes that its revised proposal is prudent while addressing these customer concerns.

6 Unit Costs Analysis

In its preliminary decision the AER stated that *“Energex has not provided a cost benefit analysis for the proposed expenditure”.* The worst performing feeder program is a compliance program prepared on a program basis. Once an individual feeder has been identified for improvement a business case in the form of a Planning Approval Report (PAR) is prepared. This includes a full options analysis resulting in the lowest cost option to meet the improvement target. A typical PAR for a worst performing feeder project was provided to the AER in response to AER EGX010.

Energex’s program is built up from unit cost estimates; the scope of work included consists of typical standard solutions that are expected to be a realistic representation of the average cost. In its preliminary decision the AER stated that *“the unit costs are forecasted to be higher than those required to manage these programs”.*

The typical topology and performance of Energex’s worst performing feeders often requires higher levels of investment per feeder in order to improve their performance in line with the Distribution Authority requirements. Typical improvement projects target customers connected towards the end of long rural feeders with limited or no alternative network transfers available. In these cases the most effective solution may be to establish new 11kV ties or to address the root cause of the poor reliability through reconductoring existing open wire conductor with covered conductor.

Over the last five years Energex has carried out reliability improvement works on 146 worst performing feeders of which 52 were urban feeders and 94 were rural feeders. The resulting average cost was $254k for urban feeders and $368k for rural feeders. Typically these projects consisted of lower cost options to install additional reclosers and fuses. Energex is planning to implement solutions that are intended to remove targeted feeders from the worst performing feeder list. This will therefore result in a higher average cost for network augmentation such as reconductoring with covered conductor.

Taking the above into consideration Energex has reviewed the scope of work used to prepare the worst performing feeder program proposed in its regulatory proposal, particularly on its rural feeders, which make up the majority of the program. The table below shows the

comparison between the project style included in Energex's original proposal, the style used in the revised proposal, and that of the average rural project completed in the last five years.

Table 3 – Reliability Project Style Components

Style	ACR	Sect	Remote LBS	MDOs	CCT (m)	Recond. (m)	ABS	OH Tie (m)	Wildlife Proofing
Original proposal	2	3	1	5	1000	500	5	500	10
Revised proposal	1	2	1	2	500	-	1	-	2
Average historical project	2	1	2	1	-	-	-	-	-

As can be seen in the above table, the original style included significant amounts of covered conductor, reconductoring and new ties. These elements contributed significantly to the higher unit cost in the original proposal. The 11kV ties and reconductoring have been removed in the revised proposal, and the allowance for covered conductor per feeder has been halved. The number of reclosers and sectionalisers has also been reduced to take into consideration that the majority of worst performing feeders may already have a number of these installed. This has resulted in a lower revised capex forecast.

7 Independent Review

Energex engaged Aurecon to review its revised reliability capex forecast. Aurecon analysed the performance data of Energex's worst performing feeders over the last five years, as well as its reliability expenditure in the current regulatory control period. Based on this analysis Aurecon have concluded that Energex's revised reliability capex is the minimum required to comply with the obligations in its Distribution Authority and may require management using measures other than capital expenditure solutions.

A copy of Aurecon's report is provided as Appendix 4.5 to Energex's Revised Regulatory Proposal.