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John McLaren
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Dear John

INTRODUCTION

1. This submission has been prepared in repose to the Commission's paper, *Proposed Quality Targets and Incentives for Default Price-Quality Paths from 1 April, 2015* (Quality Paper). The Quality Paper details the service quality thresholds that the Commission proposes to apply to Top Energy under its default price-quality path (DPP) regulatory regime after 1 April 2015. It also details the proposed service quality incentive scheme that the Commission proposes will apply to Top Energy for the regulatory period beginning 1 April 2015.
2. We are a member of the Electricity Networks Association (ENA), which is also submitting on this paper. We also support the submission prepared by PricewaterhouseCooper (PwC) on behalf of many of the EDBs that would be regulated by the proposed DPP. Our objective in preparing this separate submission is not to duplicate the points made by the ENA and PwC, but to ensure that, in finalising the DPP that will apply to Top Energy over the upcoming regulatory period, the Commission is cognisant of our somewhat unique situation. We trust that in finalising the DPP the Commission will give due consideration to the impact that its current proposals relating to service quality could have on our asset management and network development plans.

BACKGROUND

3. Our supply area covers the north of Northland, one of the most economically deprived regions of the country. It is sparsely populated, with no major urban centre. Over the last twenty years it has experienced a demographic shift, with growth now concentrated on the eastern seaboard, well away from the areas that the transmission grid was built to serve. This shift has been so significant that the most populous town in our supply area is not served by a local grid exit point and the nearest transmission line currently operating at 110 kV is almost 30 km away.
4. The distribution network was originally designed to ensure that electricity was available in all parts of our supply area, with cost rather than reliability being the primary concern. Our predecessor, the Bay of Islands Electric Power Board, continued to receive government subsidies through to the mid 1980s to provide supply to unelectrified pockets of the area we serve. Today, 32% of our high voltage distribution network is considered uneconomic when assessed against criteria developed in 2009 by the then Ministry of

Economic Development. These lines supply just 8% of connected consumers, and proportion of total energy supplied that is delivered through these lines is undoubtedly significantly lower.

5. Over the years it has proved difficult to both keep this uneconomic network component serviceable and at the same time fund the investment necessary to keep pace with changing customer and regulatory expectations on supply reliability, while keeping the price of electricity at a level that our community considered affordable. In this environment, investment in reliability initiatives has typically had the lower priority and as a result our supply reliability is the lowest in the country.
6. Rectifying this situation is not straight forward. Some of the key challenges to address include:
 - The fact that approximately 30% of our consumer base is reliant on the availability of a relatively long (55 km), single circuit 110 kV transmission line, built over difficult terrain;
 - An inadequate number of zone substations, given the size of our supply area and the number of connected consumers. The result is a distribution network with long distribution feeders, many supplying an excessive number of consumers;
 - Low fault levels, making discrimination difficult. The result is that most subtransmission faults cause a supply interruption, even if an alternative circuit is available. This can be addressed through the installation of unit protection, but this is expensive as it requires the installation of a high quality communications infrastructure.
7. Nevertheless in 2009 our Board, after extensive stakeholder consultation, decided that a new strategy was required to break out of a situation that was proving increasingly unsustainable and also an impediment to the region's economic development. It approved a challenging investment plan designed to upgrade the network to the point that it will be capable of providing a reliability of supply comparable to that received by consumers in other rural and provincial communities throughout the country. The plan included:
 - Increasing the level of operational expenditure, with a particular emphasis on vegetation management. This has already been implemented and is showing excellent results;
 - Installation of additional remote controlled switches in the subtransmission and distribution network to allow faster restoration of supply to customers not directly affected by a fault. Again this programme is showing good results;
 - Construction of a new 110 kV transmission line between Kaikohe and Kaitaia to provide a second supply to customers in the northern area. This line will be constructed over a route better placed to serve load centres on the eastern seaboard. A preliminary design has been completed and the first section of the line has been completed and is operating at 33 kV. Negotiations with land owners to finalise the route continue;
 - Installation of fibre optic cable on existing subtransmission lines and the subsequent installation of unit protection to increase the reliability of this network;
 - Installation of four new zone substations to cater for load growth on the eastern seaboard and increase the reliability and utilisation of the high voltage distribution network by increasing the number of injection points;

- Increasing capital expenditure on asset replacement to replace older assets that have reached the end of their economic life.
8. This programme has required us to implement significant price increases since 2009 with little community resistance which was critical to ensure success in funding our planned investment.
 9. There are aspects of the Commission's proposed DPP quality path that are not well aligned with feedback received from Top Energy's customers and what we are working to achieve. If implemented as currently proposed, the risk is that the wrong investment messages will be sent and our asset management expenditure will have to be amended to meet the targets set by the Commission rather than focused on the achieving our longer term goal based on feedback from our customers.
 10. We acknowledge that the Commission's regulatory framework is designed to mitigate this risk through the availability of a customised price path (CPP). However, the costs of preparing a CPP application and engaging with the Commission during the evaluation process are substantial in terms of both management time and consultancy fees. These costs would be particularly onerous for a small EDB such as Top Energy. Again, we think our consumers would be better served if the funds required to prepare and process a CPP application were invested in our reliability improvement programme.

The specific areas for our submission are:

i. NORMALISATION OF RELIABILITY MEASURES

11. The objectives of the Commission's DPP regime are best achieved if measurements of service levels are based on outcomes that are both important to consumers and within the control of management. For the DPP regime, the Commission has chosen supply reliability as the primary measure of service level outcomes because it is important to consumers and also because it can be quantitatively and objectively measured. However, supply reliability is affected by events (usually weather related but sometimes due to the unexpected failure of a critical asset) that cause supply interruptions of a severity that is beyond the response capability of an EDB. Hence measures of supply reliability reflect not only the ability of an EDB to manage its assets in a way that efficiently produces outcomes that consumers value, but also reflect the impact of these extraordinary events. The usefulness of reliability measures for regulatory purposes is diminished to the extent that they reflect outcomes that an EDB cannot reasonably be expected to control.
12. To address this deficiency the Commission permits raw measures of supply reliability to be "normalised" with the use of a boundary value before they are used for regulatory control. The objective of the normalisation process is to remove the uncontrollable component of the measures so that the normalised measures only reflect the controllable components that are reasonably within the capability of an EDB to manage.
13. Our major concern is with the Commission's proposal to use SAIFI as the key trigger (and a combination of SAIFI and SAIDI) in determining whether a major event day (MED) has occurred and for the normalisation process to be applied.
14. We have assessed Top Energy's historic 2005-14 reliability against the boundary values proposed by the Commission and identified 15 days on which the SAIDI boundary value is exceeded and only 5 days when the SAIFI boundary value was exceeded¹(refer to

¹ For this analysis we used the data set used by the Commission in the preparation of the Quality Paper. This did not include interruptions due to outages of the 110 kV Kaikohe-Kaitaia transmission line prior to its acquisition from Transpower on 1 April 2012. We are currently preparing an updated data set, which will include this information in response to the Commission's Section 53ZD notice dated 13 August 2014.

- Appendix 1). Both these levels are well below the 23 MEDs that the Quality Paper indicated had been the basis for setting the boundary value. The very small number of SAIFI MEDs, in particular, suggests a flaw in the Commission's analysis, the impact of which becomes particularly serious if SAIFI is to be a trigger for the normalisation of SAIDI.
15. We have not examined in detail the derivation of the SAIDI and SAIFI boundaries. However, the analysis is based on the assumption that daily reliability outcomes will follow a log-normal distribution, which conceptually seems more valid for SAIDI, than for SAIFI. The log-normal distribution is predicated on the assumption that the consequences of an event that exceeds an EDB's response capability will be unbounded and that the reliability measure will continue to deteriorate until the situation is resolved. Hence measured outcomes an order of magnitude or more above typical levels are possible. In the case of SAIFI there is a natural cap in that, irrespective of the severity of an event, under normal circumstances a consumer will only experience a single interruption. Hence the long "tail" that is apparent in a log normal distribution is unlikely to be present.
 16. Our concern on the Commission's approach is further supported by our recent experience in July 2014 when our supply area was hit by its worst storm since Cyclone Bola in 1988. The storm, which lasted several days, blocked many roads within the supply area, including State Highway 1 which was impassable for more than a week, and caused extensive flooding. Extensive damage was caused to our subtransmission and distribution networks and repairs were delayed by our inability to access fault locations. Fault crews from Northpower, Counties Power and WEL were called in to assist with supply restoration. At the height of the storm, 16,000 of Top Energy's 32,000 consumers were without supply.
 17. Interruptions on 8 July 2014, the first day of the storm, had a SAIFI impact of 0.85 and a SAIDI impact of 1,177 minutes. Interestingly, while the SAIFI impact was only 33% higher than the Commission's proposed SAIFI boundary of 0.644, the SAIDI impact was a full 3,112% higher than the 39 minute SAIDI boundary. In fact, the raw SAIDI impact for just this one day was higher than the total annual raw SAIDI for any of the ten years of the Commission's 2005-14 historic review period.
 18. We can use the above storm to develop a realistic scenario that demonstrates what we consider a major weakness in the proposed normalisation approach when it is applied to the Commission's proposed service quality incentive scheme. Suppose the storm had slightly less impact and resulted in a daily SAIFI of 0.63 and a SAIDI impact of, for example, 750 minutes, which is still higher than our proposed annual SAIDI cap for the service level incentive scheme. Given our recent experience, such a scenario is very plausible. In this scenario, because the SAIFI normalisation trigger was not reached, the raw SAIDI would be used to assess our SAIDI incentive and we would lose the full SAIDI revenue at risk as a result of a single event. If however, the SAIFI was marginally higher at 0.65, normalisation would apply and the daily SAIDI would be normalised to 39 minutes. It would then be quite feasible for us to receive a reward under the incentive scheme. We suggest that an incentive scheme where the outcome could change so dramatically as a result of such a small movement in a single input variable is not credible.
 19. From a regulatory perspective, removal of the impact of the storm event entirely from the reliability measures, as required by IEEE 1336:2003, would be more sensible as it would allow the Commission to monitor our performance as if the storm event had not occurred.
 20. It is of further concern that the Commission purports to set boundary values on the assumption that we would experience on average 2.3 SAIFI MEDs and 2.3 SAIDI MEDs a year, but when the analytical results are tested against actual data gathered over a 10 year period, the actual average number of MEDs is much lower. This suggests the Commission's analysis is not valid, most likely because the correlation between the assumed log normal distribution and the actual distribution daily reliability outcomes is

low. In our view, given that data for a 10 year period is available, the boundary values should be established on the basis of actual daily reliability rather than an assumed distribution. Using this approach, our SAIFI boundary value would reduce from 0.644 to 0.332 and our SAIDI boundary value from 39.56 to 28.43. These reductions are substantial.

ii. PLANNED INTERRUPTIONS

21. The Commission is proposing that, in measuring reliability for regulatory purposes, planned interruptions will be weighted down by 50%. It notes that consumers have the ability to make alternative arrangements if notified in advance that an interruption will take place and considers that distributors should not be unduly incentivised to delay or cancel unplanned work.
22. It further proposes that the SAIDI and SAIFI boundary values apply only to unplanned interruptions, which it considers appropriate because major events that severely disrupt the network cannot be planned². While this is undoubtedly true for most EDBs in most instances, it does not hold for Top Energy, since it is necessary for us to shut down the single circuit Kaikohe-Kaitaia 110 kV line on a regular basis. These planned shutdowns are extremely disruptive and must be meticulously planned. The last such shutdown on Sunday 17 March 2013 had a SAIFI impact of 0.229 and a SAIDI impact of 119.5 minutes. Even if SAIDI was weighted down by 50%, the SAIDI impact of this planned shutdown would still exceed the Commission's proposed SAIDI boundary value. The next shutdown of this line is currently planned for November 2014³. It is important to note that this Network configuration does not meet the regulatory requirement (EA/ComCom) to justify improving security based on the value of lost load and therefore supports for planned outages to have SAIDI and SAIFI boundary's applied⁴. It is not in the interests of our consumers for Top Energy to be incentivised to defer necessary maintenance of this line, as this would heighten the risk of an unplanned interruption that would be even more disruptive.
23. Following our customer survey completed in May 2014, we are revising our policy on the use of small generators to limit the reliability impact of planned interruptions, since the majority of consumers surveyed indicated that they would not want, or be prepared to pay more for generation during a planned shutdown. This highlighted that the cost of generation exceeds the value to consumers of the lost energy saved. Consequently the measured reliability impact of our planned interruptions going forward is likely to be greater than reported in recent years.
24. We would encourage consideration that measures of reliability for regulatory purposes should capture unplanned interruptions only. We consider that for safety reasons it should be normal practice to de-energise high voltage lines before they are worked on and that live line work should be the exception rather than the rule. We submit that the DPP framework should support this philosophy and not incentivise the unnecessary use of live line techniques.
 - While safe working practices have been developed for working live on high voltage lines the safety margins are much lower than if the line is disconnected from the supply. For this reason WorkSafe NZ discourages the unnecessary use of live line techniques and is currently working with the industry to develop guidelines as to when live line working might be appropriate. It is likely that these guidelines will require consideration of issues that are not well captured by the Commission's SAIDI and SAIFI measures, which assume that all consumers are equal and take no account of differences that consumers place on the value of unserved energy.

² Quality Paper, Clause 3.7.

³ Transpower arranged similar shutdowns but these had less effect on its reported reliability because of the size of its network.

⁴ With a growing trend of asset transfers from Transpower to EDB's, instances such as this are likely to become more common.

There should also be no incentive for EDBs to limit the impact of planned interruptions through the use of mobile generation downstream of the work site if the cost of providing this generation is higher than the value the affected consumers are likely to place on the energy not supplied.

CONCLUSION

25. In summary:

- SAIDI normalisation should be triggered by a SAIDI boundary value not a combination of SAIFI and SAIDI; and
- The boundary values for SAIDI and SAIFI should be established on the basis of 10 year actual daily reliability rather than an assumed distribution as it is clear that the MED boundary levels proposed by the Commission result in a number of MED's for Top Energy well below the modelled expectation; and
- Planned interruptions should be excluded for regulatory purposes or at least have boundary values applied to prevent instances of large planned events either distorting the underlying reliability performance or producing unintended consequences such as deferring maintenance and increasing unplanned interruptions as these can be normalised out.

26. We thank the Commission for the opportunity to make this submission. Should you have any questions or wish to further discuss the issues that we have raised, please contact:
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Yours sincerely



Russell Shaw
Chief Executive
Top Energy Limited

APPENDIX ONE

The below tables identify the actual SAIDI and SAIFI events that are required to be included to calculate boundary values to achieve the 23 MED's per the Quality Paper.

Date	SAIFI Unplanned	Date	SAIDI Unplanned
26/07/2008	1.041	10/07/2007	356.44
15/04/2008	1.016	26/07/2008	214.81
10/07/2007	0.823	30/07/2008	100.19
30/07/2008	0.781	18/09/2005	92.95
19/02/2005	0.751	11/07/2009	90.52
28/05/2013	0.636	28/05/2013	78.96
16/05/2004	0.612	15/04/2008	75.87
19/12/2005	0.510	15/03/2014	58.12
18/09/2005	0.501	12/07/2009	51.10
24/11/2008	0.459	19/02/2005	49.66
11/07/2009	0.431	29/03/2007	49.02
6/12/2007	0.402	11/07/2007	46.78
14/06/2006	0.385	6/12/2007	46.49
15/08/2008	0.382	3/06/2011	41.98
3/06/2011	0.377	12/06/2006	40.03
16/11/2007	0.368	18/07/2009	36.43
9/12/2007	0.364	19/12/2005	35.33
23/02/2008	0.356	19/03/2012	35.16
15/03/2014	0.353	16/05/2004	35.14
22/02/2006	0.349	15/08/2008	34.43
21/04/2013	0.347	16/04/2013	34.41
4/08/2010	0.339	21/04/2013	29.36
1/10/2007	0.332	13/10/2012	28.43