From the Electricity Networks Association

Submission on proposed quality targets and incentives for Default Price-Quality Paths from 1 April 2015

Final

29 August 2014

The Electricity Networks Association makes this submission along with the explicit support of its members subject to Default Price-Quality Path regulation, listed below.

Alpine Energy Ltd

Aurora Energy Ltd

Centralines Ltd

Eastland Network Ltd

EA Networks Ltd

Electricity Invercargill Ltd

Horizon Energy Distribution Ltd

Nelson Electricity Ltd

Network Tasman Ltd

Orion New Zealand Ltd

OtagoNet Joint Venture

Powerco Ltd

The Lines Company Ltd

Top Energy Ltd

Unison Networks Ltd

Vector Ltd

Wellington Electricity Lines Ltd

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1. Introduction

1. The Electricity Networks Association (ENA) appreciates the opportunity to provide feedback to the Commerce Commission (the Commission) on the 2015 DPP Quality Incentives Paper[1].

2. Our initial comments on the proposals were included in our 15 August submission on the DPP Main Policy Paper[2].

3. The ENA represents the 29 electricity network businesses (ENBs) in New Zealand.

1.1 Summary

4. With regards to the proposed DPP quality standards, the ENA:

   a) In principle supports a move to a quality incentive scheme; however we note that determining the key features of the scheme are critical to its success.

   b) Has particular concern with the proposed approach to normalisation, compliance and enforcement, and the pro rata adjustments for prior period breaches.

   c) Notes that the proposed scheme is heavily influenced by the frequency of major event days. The ENA considers that a scheme which is unduly influenced by the weather does not meet the underlying objective of recognising/penalising systematic improvements/declines in performance.

   d) Considers that these matters must be addressed before a revenue incentive scheme can be introduced successfully. Absent these changes, retention of the current pass/fail model is the appropriate alternative.

   e) Supports further refinements to measuring quality of service, initially through Information Disclosure (ID), before considering whether changes to the DPP quality standards are warranted for future regulatory periods.

5. For the purpose of normalising reliability data to establish quality targets, the ENA:

   a) Does not consider that the proposed approach achieves reasonable outcomes because the frequency and magnitude of major events will primarily determine whether a business complies with the quality standard, the value of the financial reward or penalty, and whether the cap or collar is reached in any year.

   b) Agrees with the proposal that planned outages are de-weighted by 50% to reflect the lower level of consumer disruption associated with planned outages.

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[1] Commerce Commission, Proposed Quality Targets and Incentives for Default Price-Quality Paths from 1 April 2015

[2] Commerce Commission, Default Price-Quality Paths for Electricity Distributors from 1 April 2015, 4 July 2014

c) Submits that targets must be normalised to ensure they appropriately measure underlying reliability performance, which is not unduly influenced by the frequency and severity of major external events.

d) Submits that in order to achieve this:

i. Normalisation is applied to unplanned outages.

ii. The IEEE adjusted β coefficient method is applied to adjust for zero event days, and notes that this method is conservative as it generates fewer MEDs for NZ ENBs than assumed in the IEEE method.

iii. The SAIFI constraint on SAIDI MEDs is removed, and SAIDI MEDs are determined solely with reference to SAIDI data, and SAIFI MEDs are determine solely with reference to SAIFI data.

iv. On a MED, the actual observation is replaced with the average from the reference dataset (after normalisation) which is consistent with achieving an underlying reliability measure.

v. Outages which span multiple days are assigned to the first day.

6. For the purpose of specifying reliability targets, the ENA:

a) Supports implementing independent targets representing SAIDI (Class B and C) and SAIFI (Class B and C), as these measures represent quality which is valued by consumers, and good quality information is currently available for this purpose.

b) Notes that the proposed targets are to reflect historical averages. These are more challenging targets than the quality standards in the current DPP, which are set with reference to historical averages plus one standard deviation to reflect normal variation around the average.

c) Agrees with the Commission that natural variation can be assumed to be symmetric and should not unduly penalise, reward or create perverse incentives, assuming that a suitable reliability target and normalisation method is implemented.

d) Submits that the proposed reliability targets do not meet these criteria because they are unduly influenced by the frequency and severity of major events.

e) Submits that dead bands of +/- 0.2 standard deviation around the target should be implemented to avoid unnecessary pricing volatility for expected (and small variances) around the historical average.

f) Does not support the proposed pro-rata adjustments for prior period breaches, which are derived using different reliability measures. In addition, this proposal unduly introduces financial penalties into the next regulatory period, for prior period performance, where no fault or negligence on the behalf of the ENBs concerned has been determined. The ENA considers that this proposal is contrary to the principles of natural justice.

g) Supports the proposal to maintain fixed quality targets for each ENB for the next regulatory period.

h) Support proposals to adjust targets following the purchase of spur assets or other transactions during the next regulatory period, and notes that historical reliability for spur assets purchased prior to the next regulatory period needs to be included when setting the targets.

i) Submits that DPP quality standards should be reconsidered following a re-opener event (including a catastrophic event) if necessary. In addition the impact of re-opener events on quality incentive payments should form part of the reconsideration of the DPP.

7. In determining the revenue at risk for the quality incentive, the ENA:

a) Supports the proposal to set revenue at risk as 1% of FY16 MAR, shared equally between SAIDI and SAIFI.

b) Notes further consideration of the use of the FY16 MAR values may be required for those ENBs with alternative X factors.

8. In specifying caps, collars and incentive rates for the quality incentive scheme, the ENA:

a) Supports the proposal to apply symmetrical caps and collars.

b) Considers that setting the cap and collar at one standard deviation is a pragmatic approach for the forthcoming regulatory period, as this approach sets a useful benchmark for assessing performance which is outside an expected 'normal' range.

c) Submits that dead-bands should be included around the target, unless the normalisation methods are corrected in the manner outlined in this submission.

a) Notes that the incentive rates are a by-product of the caps, collars and revenue at risk values, and are influenced by our proposal for a dead-band around the targets.

d) Acknowledges that consumers' willingness to pay, and the cost for suppliers of achieving incremental improvements in reliability are useful guidelines for determining incentive rates. The ENA considers that these may be suitable refinements for setting incentive rates for future regulatory periods.

e) Supports the proposed process for determining, publishing and recovering/passing on the financial incentive subject to including a time value of money adjustment to the deferred incentive recovery/rebate.

f) Considers a rolling balance approach to minimise year on year pricing variation is a useful improvement to the proposal.

9. The ENA does not support the proposed compliance and enforcement standards for the quality incentive scheme and submits that the proposal:

a) Greatly increases regulatory uncertainty.

b) Places ENBs in a position of having equal probability (assuming symmetrical variation around the historical average) of being compliant or non-compliant in every year, on either target.

c) Is inconsistent with the serious consequences for non-compliance with price-quality regulation within the Commerce Act.

d) Is inconsistent with the intent of the incentive regime which is to allow quality performance to improve or reduce to reflect consumer preferences.

e) Significantly increases the compliance standard relative to the current DPP, with no financial compensation for ENBs.

10. The ENA submits that non-compliance with the quality standards should be determined where annual performance exceeds the cap (on either measure), two out of three years in a row. This recognises the role of the financial penalty for performance under the cap, and appropriately seeks to identify material deterioration in performance.

11. We provide more detailed comment on these points in the body of our submission.

12. The ENA's contact person for this submission is:

Nathan Strong
Chair, ENA Regulatory Working Group
Email: nathan.strong@unison.co.nz
Tel: 021 566 858 or 06 873 9406

2. Targets and incentives for service quality

2.1 Revenue linked quality incentive scheme

13. The ENA, with the assistance of the Quality of Supply Work Group, has considered a number of options for how quality standards maybe determined for the 2015-2020 DPP. In our submission on the Process and Issues Paper, we submitted that, for the purpose of determining quality standards for the next DPP regulatory period:

a) Reliability measures are retained as the primary measure of service quality for the forthcoming DPP reset, and any potential additional measures are introduced firstly via ID regulation before further consideration for DPP purposes in the longer term

b) Moving to a more incentive based approach to determining the DPP quality standard, but that any changes that are introduced are rigorously stress tested prior to implementation, and that an incremental approach is adopted for the forthcoming reset

c) A number of further refinements to the current reliability measures should be investigated to improve the treatment of extreme events and normal variation and the interplay between the measures

d) Further analysis of reliability data is required, before the parameters for an incentive scheme are determined

e) An incentive scheme would require some form of an adjustment factor to be included in the DPP price path.

2.1.1 Incentive scheme proposed

14. The DPP Main Policy Paper proposes a revenue linked quality incentive scheme, which is explained in further detail in the Quality Incentives Paper. The key features of this scheme include:

a) Two reliability targets, reflecting annual (Class B and Class C) SAIDI and SAIFI performance

b) A ten year reference period, from 1 April 2004 to 31 March 2014

c) 50% de-weighting of planned outages

d) Normalisation of extreme events using modifications to the IEEE 2.5 beta method. Modifications include:

i. Boundary values adjusted to reflect zero event days

ii. A SAIDI major event day is dependent on SAIFI exceeding boundary on the same day

iii. Major event days are normalised to the boundary

e) Targets are adjusted downwards proportionately for prior DPP breaches

f) Caps and collars for the incentive scheme are set as one standard deviation around the target

g) Revenue at risk is 1% of maximum allowable revenue (in the first year of the DPP), shared equally between SAIDI and SAIFI

h) Performance above the target is deemed non-compliant, and:

i. No enforcement action is envisaged where performance is under the cap, except in exceptional circumstances

ii. Pecuniary penalties may be sought in addition to financial penalties which arise from the incentive scheme.

2.1.2 Future refinements

15. The ENA supports consideration of future refinements to the Quality Incentive Scheme, which may be introduced in future regulatory periods. We consider that additional quality measures can be tested through the ID regime, which provides an appropriate mechanism for collecting data and testing new measures, before introducing them into the DPP.

2.1.3 Analysis of options

16. The ENA has undertaken considerable analysis of a range of options for establishing quality standards and incentive arrangements for the 2015-2020 DPP regulatory period. This has been greatly assisted by access to the same detailed reliability data which the Commission has been using for its own analysis, and we are grateful for the Commission's assistance in standardising this data and making its database available to us for this purpose[3].

17. Our comments throughout this submission have been informed by our analysis of the ten year (FY05-FY14) reliability datasets for each of the 16 non-exempt EDBs (ie: all other than Orion New Zealand).

2.2 Success criteria

2.2.1 Choosing between alternative options

18. In the remaining sections of this submission we consider the detailed specification of the proposed quality targets and incentive arrangements. However as previously

[3] The non-exempt ENB reliability dataset we have used to inform this submission was provided to us by the Commission on 10 June 2014.

submitted, we note that there are many different options available given the multiple steps that are involved in specifying quality targets and associated revenue incentives.

19. Accordingly we have evaluated the proposed quality targets and incentives against key success criteria, which is summarised in the table overleaf.

2.2.2 Summary of our evaluation

20. While there are many of the features of the proposed scheme which we consider are consistent with the success criteria noted above, as we submitted in our response to the DPP Main Policy Paper, there are some features we are particularly concerned about, including:

a) Normalisation for major events

b) Adjustments for prior year breaches

c) Compliance and enforcement criteria and processes.

21. We consider that these issues must be addressed before a revenue incentive scheme can be introduced successfully.

22. We note that we are in principle supportive of a revenue linked incentive scheme provided it operates in a credible and reasonable way. The ENA submits that changes must be made to the proposed incentive scheme before it can be introduced. Absent these changes, retention of the current pass/fail model is the appropriate alternative.

Table 1: Evaluation of Proposed Quality Targets and Incentives

Feature of Quality Incentive Scheme	Proposal	Relevant Success Criteria	Assessment Against Criteria	Proposed Alternative/Future Development
Measuring quality	Class B and C SAIDI and SAIFI, SAIDI and SAIFI weighted equally	Consumer value Ability to implement	Valued by consumers Data is available, so able to be implemented	Consider additional measures for future regulatory period Introduce first through IDM to gather information and test relevance
Reference period	Ten years prior (FY05-FY14)	Currency Inter period variation Certainty	Use of recent data supported, as current Ten year period assists to mitigate inter-period variation Fixed period supported as more certain	
Treatment of planned outages	50% de-weighting	Consumer preferences Restoration incentives Incentives to undertake planned work	Planned outages less disruptive to consumers Planned outage measures reflect service quality and inclusion provides incentives to manage and restore De-weighting reduces incentive to defer planned work to avoid non-compliance	

Feature of Quality Incentive Scheme	Proposal	Relevant Success Criteria	Assessment Against Criteria	Proposed Alternative/Future Development
Identifying extreme events	IEEE MED method, adjusted for zero event days using bespoke approach, applied to unplanned outages	Measuring underlying reliability performance Equitable treatment across ENBs	Adjusting for zero event days important for equivalence, but proposed method differs to IEEE approach Normalising multi-event days preferred (as is applied in other regimes) but current datasets insufficient Assigning prolonged outages to first day assists capture impact of significant events	Apply IEEE method for zero event days which ensures consistency of method Future development of outage recording to allow identification and normalisation of multi-day events
Normalising for extreme events	SAIDI MED dependent on SAIFI MED Replace MED with boundary	Measuring underlying reliability performance Restoration incentives Incentives to undertake remedial work	SAIFI constraint on SAIDI MED compromises measuring underlying reliability as SAIDI performance remains unduly exposed to the impact of major unplanned events Applying boundary on MED inconsistent with underlying reliability measure objective, as boundary values are significantly above average (or normal) performance Retains incentives to manage by including MEDs in dataset Incentives to restore supported through other means eg: consumer communication, community commitment Ignores importance of maintaining safety standards when responding to major event	SAIDI MEDs normalised where daily value exceeds SAIDI boundary MEDs replaced with average, not boundary

Feature of Quality Incentive Scheme	Proposal	Relevant Success Criteria	Assessment Against Criteria	Proposed Alternative/Future Development
Accommodating normal variation	Target is historical mean, with adjustments for breaches in prior regulatory period	Avoiding false positives Maintaining no material deterioration standard	Historical mean is a benchmark, but actual performance will vary around the mean with equal probability either way (if quality standards are maintained and the frequency and severity of significant events is unchanged) Adjustments for prior period breaches mixes methods, and penalises ENBs for performance which has been investigated and accepted within the current regulatory period	Remove prior period breach adjustments Apply dead-band around average if normalisation methods not corrected
Revenue at risk	1% of FY16 MAR	Strength of incentive Risk and reward	Relatively low revenue at risk amount suitable for first regulatory period Provides incentives for quality performance through financial reward/penalty mechanisms	
Caps and collars	Symmetric around target - 1 standard deviation of target	Symmetry Strength of incentive Risk and reward Consistency across ENBs Cost/value of incremental quality	Equalises rewards and penalties (subject to fair specification of target, otherwise more risk than reward) Maintains equivalence across ENBs and with current target, subject to compliance criteria (see below) Incentive rates do not align well with value of lost load or cost of incremental quality improvement Standard deviation band useful measure of expected range around the mean	Consider VOLL and incremental cost of improving reliability for future regulatory periods

Feature of Quality Incentive Scheme	Proposal	Relevant Success Criteria	Assessment Against Criteria	Proposed Alternative/Future Development
Incentive mechanism	Annual reward/penalty, recovered in subsequent year + 1 through prices	Complexity Lag before reward/penalty applies Volatility	Transparent, certain and straightforward Lag is necessary, but pricing impact is timely Year on year volatility expected, but mitigated by relatively low revenue at risk	Add time value of money adjustment for deferral Consider rolling balance to mitigate pricing volatility
Compliance and enforcement	Non-compliant if above target	Certainty Incentives and risk Avoiding false positives Extreme circumstances	Substantial increase in compliance standard relative to current approach, with no financial compensation Fails to recognise normal variation around the mean Compliance proposal adds, not reduces uncertainty Does not consider extreme circumstances	Non-compliance threshold is the cap, subject to a two out of three year test, which maintains consistency with current regime, appropriately identifies material deterioration and recognises additional financial penalties for suppliers within the cap

2.3 Recommendations

23. With regards to the proposed DPP quality standards, the ENA:

a) In principle supports a move to a quality incentive scheme; however we note that determining the key features of the scheme are critical to its success.

b) Has particular concern with the proposed approach to normalisation, compliance and enforcement, and the pro rata adjustments for prior period breaches.

c) Notes that the proposed scheme is heavily influenced by the frequency of major event days. The ENA considers that a scheme which is unduly influenced by the weather does not meet the underlying objective of recognising/penalising systematic improvements/declines in performance.

d) Considers that these matters must be addressed before a revenue incentive scheme can be introduced successfully. Absent these changes, retention of the current pass/fail model is the appropriate alternative.

e) Supports further refinements to measuring quality of service, initially through ID, before considering whether changes to the DPP quality standards are warranted for future regulatory periods.

3. Normalisation method for reliability targets

3.1 Why normalise?

24. Reliability performance is influenced by events which are largely outside the control of ENBs. Accordingly methods have been developed which normalise for the impact of such events, in order to derive a measure of underlying reliability performance. The ENA agrees that normalisation is an important feature of the DPP quality standards, as this enables fair comparisons of year on year reliability data, against the historical benchmarks which are used to set the quality targets.

25. However the ENA does not consider that the proposed approach achieves reasonable outcomes because the frequency and magnitude of major events will primarily determine whether a business complies with the quality standard, and whether the cap or collar is reached in any year.

26. We note that the proposed approach to normalisation is contrary to international methods, where major events are excluded from annual assessments, multi day events are normalised and SAIDI is assessed independently of SAIFI.[4]

27. As a consequence we submit that the financial penalties and rewards of the proposed incentive scheme will be unduly influenced by the weather and other drivers of significant unplanned events. In years where there are above average numbers of storms, not only will EDBs have to pay the additional costs of remediation, but pay their customers for the impact of the poor weather on their network performance. As we submitted in our response to the DPP Main Policy Paper, the ENA considers that a scheme which is unduly influenced by the weather does not meet the underlying objective of recognising/penalising systematic improvements/declines in performance.

28. In the following paragraphs we comment on the detailed specification of the proposed normalisation method.

3.2 Proposed method

3.2.1 Weighting planned and unplanned outages

29. The ENA supports the proposal to apply a 50% de-weighting to planned interruptions. We support continuing to include both planned and unplanned outages in the reliability

[4] ENA, Submission on default price-quality paths from 1 April 2015 for 17 electricity distributors: process and issues paper, Attachment A, An International Perspective on Service Quality

measures, however, currently there are incentives for ENBs to defer planned work, in order to avoid planned outages if these outages would give rise to a potential breach.

30. Planned outages are generally less disruptive to consumers as they are notified in advance, and in many cases scheduled to minimise the impact on consumers (ie: at periods of low or non-critical demand). Accordingly a de-weighting for planned outages is appropriate as it improves incentives to undertake planned work while maintaining incentives to manage the frequency and duration of planned outages.

3.2.2 Boundary values

31. The boundary values used to identify MEDs are to be derived from the IEEE standard (which currently is applied in the DPP Quality Limits), but applied only to unplanned outages, and after adjusting the method to accommodate zero event days.

32. We note that it is proposed to determine boundary values using only unplanned outage data, and to normalise only for unplanned outages. We acknowledge that it is unplanned outages that contribute to unexpected variation in reliability performance arising from external events which are largely outside the control of ENBs.

33. The IEEE standard assumes an ENB can expect to have 2.3 MEDs per year, assuming a log normal distribution in the number and frequency of outages.

34. The proposed approach to adjusting the boundary values to account for zero event days reflects a bespoke method developed by the Commission. It is not clear why a new method has been developed, when the IEEE itself has undertaken work in this area. We note that the modified approach which accounts for zero event days is not applied in the US, as zero event days are not common there.

35. Attachment A describes the IEEE method for adjusting for zero event days when deriving boundary values for major event normalisation purposes. We have tested this method on the 2005-2009 reliability datasets comprising planned and unplanned outages for the 16 non-exempt ENBs.[5]

36. As illustrated in Figure 1 overleaf, the standard IEEE method does not work well for some ENBs in New Zealand, as the boundary values are abnormally high (when expressed as a proportion of the average annual reliability performance). Figure 2 shows how these anomalies are reduced considerably after applying the IEEE method which accounts for zero event days.

37. The proposed method described in the Quality Incentives Paper, which has been developed by the Commission, is similar to but not the same as the method developed by the IEEE. Attachment Two shows a comparison of the boundary values derived from the reference period data (2005-2014) for each non-exempt ENB, using the current DPP (IEEE standard) method, the Commission's proposed method and the IEEE adjusted β coefficient method. The number of event days is also shown, which demonstrates how common non-event days are for some businesses in New Zealand.

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[5] This excludes Orion New Zealand, which is currently subject to a CPP with unique reliability standards.

38. While the proposed method generates similar boundary values to the IEEE adjusted method, the ENA considers it is more appropriate to use the adjustments that the IEEE has developed to its own standard method, in order to address the zero event day issue. This method is presented in Attachment A.

Figure 1: Boundary Values Using Standard IEEE method

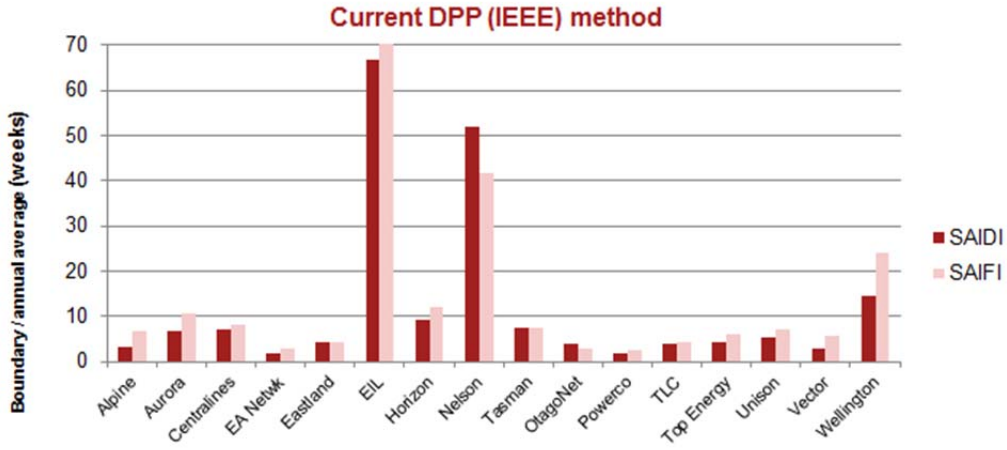
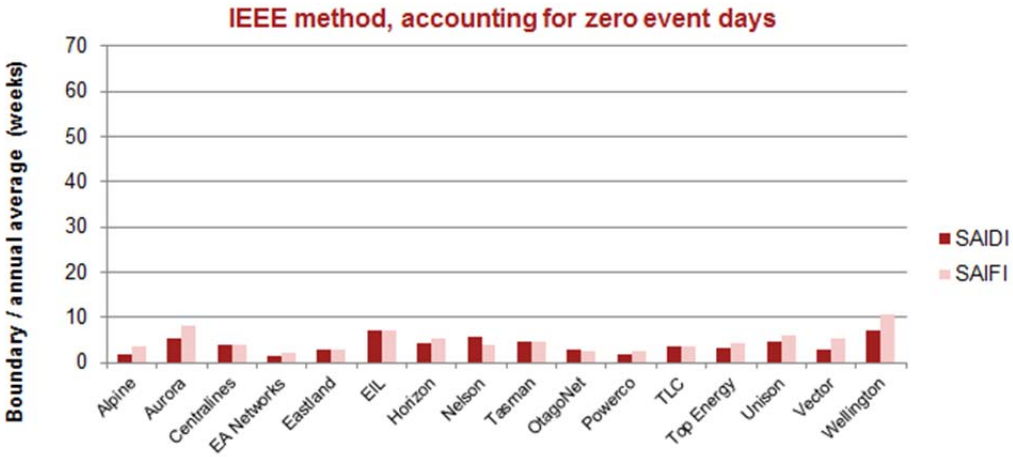


Figure 2: Boundary Values Using IEEE method with Adjusted β Coefficient



39. We note that if the proposed method for determining boundaries is applied to the ten year datasets of the 16 non-exempt ENBs, a total of 219 SAIDI MEDs and 139 SAIFI MEDs result. This equates to 1.4 SAIDI MEDs per ENB per year and 0.9 SAIFI MEDs per ENB per year, which is considerably lower than the IEEE standard which is predicated on the basis that each distributor can expect to have 2.3 MEDs per year, per measure.

40. The reason for this is that the IEEE method assumes a log normal distribution in the number and frequency of outages. This assumption has been challenged by members

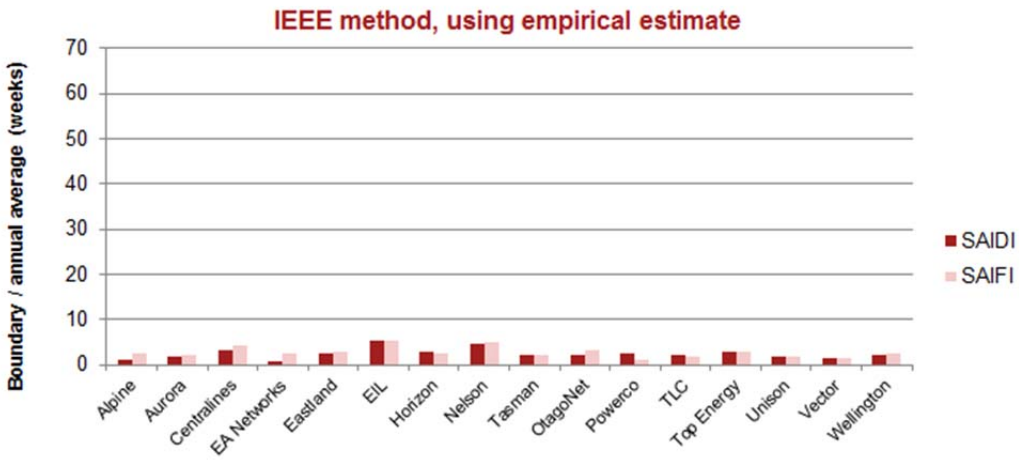
of the IEEE,[6] and SRA for the ENA in 2009. In addition, examination of the log normal distribution method outside the US has raised concerns about the appropriateness of this assumption in other countries.[7]

41. SRA recommended that the assumption that non-zero daily SAIDI and SAIFI values follow a log-normal distribution be replaced by the assumption that they follow a more flexible family of distributions, such as a mixture of log-normal distributions. [8]

42. If an empirical estimate of the boundary is used instead, which assumes that 0.62% of all event days are MEDs (which generates 2.3 MEDs per measure per ENB per year), the boundary values are lower than those proposed and those which are generated by the adjusted β coefficient method noted above. This is illustrated below.

43. Thus the IEEE method (after adjusting for zero event days) is conservative because it generates fewer MEDs for New Zealand ENBs than the underlying IEEE methodology predicts.

Figure 3: Boundary Values Using Empirical Estimate



44. The tables overleaf show the impact on the 2.5 beta co-efficient and boundary values, after the IEEE method for adjusting for zero event days is applied, rather than the method proposed in the Quality Incentives Paper.

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[6] For example: R Billinton and J Acharya, Major Event Day Segmentation, IEEE Transactions on Power Systems 21, 2006

[7] For example: J Field, Defining major event days, A submission to the Australian Energy Regulator, commissioned by ETSA Utilities, 2008, and E Fumagalli, L Lo Schiavo, S Salvati and P Secchi, Statistical identification of major event days: an application to continuity of supply regulation in Italy, IEEE Transactions on Power Delivery, 21: 761-767, 2006.

[8] Statistical Research Associates, Reset of Default Price-Quality Path for Electricity Distribution Businesses, 19 June 2009, Recommendation 1(c)

Table 2: Adjusting the 2.5 β co-efficient

Adjusting the 2.5 β co-efficient for zero event days		
	Draft DPP k-value	**IEEE adjusted β co-efficient**
Alpine Energy	1.96	1.96
Aurora Energy	2.30	2.30
Centralines	1.95	1.95
EA Networks	2.14	2.14
Eastland Network	2.15	2.16
Elec. Invercargill	1.22	1.23
Horizon Energy	1.90	1.90
Nelson Electricity	0.42	0.42
Network Tasman	1.99	2.00
OtagoNet JV	2.08	2.09
Powerco	2.48	2.48
The Lines Co	2.38	2.39
Top Energy	2.21	2.22
Unison Networks	2.27	2.28
Vector	2.45	2.46
Wellington Electricity	2.12	2.13

Table 3: Adjusting boundary values

	Boundary values			
	SAIDI		SAIFI	
	Draft DPP boundary	Boundary consistent with IEEE Method	Draft DPP boundary	Boundary consistent with IEEE Method
Alpine Energy	14.03	14.21	0.13	0.13
Aurora Energy	10.92	11.07	0.26	0.27
Centralines	9.67	9.79	0.48	0.48
EA Networks	8.98	9.09	0.11	0.11
Eastland Network	17.13	17.31	0.21	0.22
Elec. Invercargill	4.18	4.25	0.12	0.12
Horizon Energy	17.85	18.01	0.25	0.25
Nelson Electricity	2.12	2.13	0.04	0.04
Network Tasman	19.02	19.27	0.16	0.17
OtagoNet JV	13.43	13.59	0.16	0.16
Powerco	11.31	11.42	0.13	0.13
The Lines Co	15.84	15.93	0.26	0.26
Top Energy	39.56	39.95	0.64	0.65
Unison Networks	10.95	10.96	0.19	0.19
Vector	9.88	9.99	0.14	0.14
Wellington Electricity	6.85	6.85	0.11	0.11

3.2.3 MED trigger

45. One of the other significant changes to the proposed normalisation methods is to require SAIFI boundaries to be triggered before a SAIDI MED is recorded. The ENA does not support this proposal, as the impact of significant external events will not be normalised, and therefore the underlying SAIDI reliability performance is unduly distorted.

46. The Quality Incentives Paper suggests that the SAIFI trigger is appropriate because extreme events are likely to affect a large number of customers. While this may be true in many instances, it does not always hold for example:

a) SAIFI does not necessarily capture this characteristic, as large numbers of customers may be adversely affected by a small number of events, particularly in rural areas where large numbers of consumers may be reliant on one supply source or under certain network topographies where relatively few customers are serviced by a substation or feeder.

b) Major events which affect fewer, but remote customers may result in prolonged outages due to the amount of network which requires inspection and restoration, travel time and difficulties in accessing remote networks under poor weather conditions.

c) Major events which affect subtransmission networks, where limited alternative supply options exist, or where multiple subtransmission faults result in prolonged outages which affect a number of consumers.

47. We have examined the reference datasets of 16 non-exempt ENBs and have identified that of the 219 days which exceed the SAIDI boundary (using the proposed boundary values) 138 of them (63%) would be excluded from the extreme event normalisation due to the proposed SAIFI constraint.

48. By way of comparison, had the SAIDI trigger for SAIFI been retained, of the 139 days which exceed the SAIFI boundary, 58 (42%) are excluded from normalisation. Attachment C illustrates the impact of the triggers for each of the non-exempt ENBs.

49. Our analysis of the impact of the proposed SAIFI constraint on the reference dataset shows that many days where significant weather events have adversely impacted SAIDI to a greater extent than SAIFI, are not normalised under the proposal. Attachment D shows a small sample of these days, which are characterised by extreme weather events. We therefore do not agree that the SAIFI trigger appropriately identifies major event days and results in adequate normalised targets.

50. In the Quality Incentives Paper it is suggested that as ENBs have control over the duration of outages resulting from a major event, that it is not appropriate to use SAIDI as a trigger as there is no incentive to minimise the duration of the event once the boundary is exceeded. However ENBs do not know at the time of the event whether the boundary will be exceeded.

51. The ENA strongly challenges this statement which ignores the range of factors which contribute to outage durations arising from major events. The first consideration in responding to an outage is safety. This impacts on when the affected network can be inspected and repaired, whether the repair is temporary or permanent, and how long fault crews work before being rostered off, and then on again, after a rest period. These factors are also represented in ENB emergency response plans, which set out the procedures to be followed when responding to critical events. The ENA notes that the Quality Incentives Paper ignores the hazardous nature of the fault response work its members undertake, particularly during storm events.

52. ENBs respond as quickly and safety as they are able to during a major event. There is no evidence, presented in the Quality Incentives Paper, that this is not the case. We note that the Commission's WACC Percentile Paper acknowledges a range of factors outside the Part 4 regime which ensure quality of supply is maintained.[9] The Quality Incentives Paper fails to make the same acknowledgement.

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[9] Commerce Commission, Proposed amendment to the WACC percentile for electricity lines services and gas pipelines services, 22 July 2014, para 3.21.4

53. ENBs are highly motivated to restore outages as quickly as safely possible because:

b) Customers demand it. They register complaints and seek explanations about delays and restoration times

c) Outages reduce revenue and increase costs

d) Use of system agreements include performance related requirements, and for some, compensation payments for poor performance

e) Recent Consumer Guarantees Act and Electricity Participation Code amendments increase the likelihood of compensation claims against ENBs.

54. In the context of the quality targets for the DPP, the SAIDI and SAIFI targets are independent of each other. That is each is assigned the same weight within the proposed revenue incentive, and each is assessed with reference to historical SAIDI or SAIFI (as appropriate) performance. A breach of SAIFI carries the same weight and or potential consequences as a breach of SAIDI.

55. Accordingly, the ENA submits that it is the underlying SAIDI performance which is relevant for determining the SAIDI target and the underlying SAIFI performance which is relevant for determining the SAIFI target, in the DPP context. Thus SAIDI should be normalised with reference to the characteristics of the SAIDI dataset. SAIFI should likewise be normalised with reference to the characteristics of the SAIFI dataset. To do otherwise is at odds with the IEEE method, which the Commission has adopted, on the basis that it assumes a distributor can expect to have 2.3 MEDs per year.

3.2.4 MED normalisation

56. It is proposed that MEDs are replaced with the boundary value on that day. The main reason appears to be that other options which use a lower value (such as the average) may provide an incentive for a distributor to not provide the best possible quality performance if they are nearing a MED.

57. The ENA does not agree with the suggestion that ENBs do not respond in a timely way due to regulatory settings. For the reasons set out in the previous paragraphs, there are many drivers of the way in which outages are responded to, and regulatory settings are certainly not the key drivers during major events.

58. The ENA considers that the reliability targets should be set to reflect the underlying reliability of each network. Penalties are incurred if the underlying reliability is not maintained, and rewards are provided if it is exceeded. Normalising an MED with the average from the reference dataset (after normalisation), or removing it altogether is consistent with providing an underlying reliability measure. Otherwise, quality standard performance (and hence financial penalties) will be unduly influenced by the frequency of major events, because on those days, above average outage data will be recorded.

59. Another option, which provides a greater recognition of the impact of outages on MEDs, is to replace the first two MEDs in an assessment period with the boundary value (on the basis that the IEEE method for deriving MEDs assumes each supplier will exceed the boundary 2.3 times per year) and the remainder with the average (after normalisation).

60. In Attachment E, we show the impact on the proposed SAIDI and SAIFI targets, caps and collars, if our alternative normalisation approaches apply to the ten year reference datasets (after assuming planned outages are de-weighted 50%, normalisation applies only to unplanned outages, and events spanning more than one day are assigned to the first day).

3.2.5 Multi day events

61. The ENA considers that all outages that are caused by a major event should be associated with the event and normalised. This is partly achieved by assigning outages which run over more than one day to the first day. However outages which commence on subsequent days during the event are often not normalised, because the total impact on each subsequent day does not exceed the boundary value.

62. The Quality Incentives Paper notes that the datasets which are currently available do not assign outages to particular events in a common way. This limits the ability to normalise multi-day events. The ENA agrees with this conclusion for the current regulatory period, but notes that as a result, significant events remain in the normalised datasets due to the ongoing repair and remediation work which results from a major event. If such events are underrepresented in the reference dataset, then future multi-day events may have a greater impact in annual assessments.

63. The ENA support further development of outage records to better enable outages to be assigned to an event.

3.3 Recommendations

64. For the purpose of normalising reliability data to establish quality targets, the ENA:

a) Does not consider that the proposed approach achieves reasonable outcomes because the frequency and magnitude of major events will primarily determine whether a business complies with the quality standard, and whether the cap or collar is reached in any year.

b) Agrees with the proposal that planned outages are de-weighted by 50% to reflect the lower level of consumer disruption associated with planned outages.

c) Submits that targets are normalised to ensure they appropriately measure underlying reliability performance, which is not unduly influenced by the frequency and severity of major external events.

d) Submits that in order to achieve this:

i. Normalisation is applied to unplanned outages

ii. The IEEE adjusted β coefficient method is applied to adjust for zero event days, and notes that this method is conservative as it generates fewer MEDs for NZ ENBs than assumed in the IEEE method

iii. That the SAIFI constraint on SAIDI MEDs is removed, and SAIDI MEDs are determined solely with reference to SAIDI data, and SAIFI MEDs are determine solely with reference to SAIFI data

iv. On a MED, the actual observation is replaced with the average from the reference dataset (after normalisation) which is consistent with achieving an underling reliability measure. An alternative approach is to apply the boundary value to the first two days MEDs in an assessment period, in recognition of the outage impact of those days, consistent with the IEEE assumption of 2.3 MEDs per year

v. Outages which span multiple days are assigned to the first day.

4. Reliability Targets

4.1 Proposed method

4.1.1 Quality measures

65. Independent targets representing SAIDI (Class B and C) and SAIFI (Class B and C) are proposed. The ENA supports this approach, which builds on the current quality limits, employs measures of quality which are valued by consumers, and these measures are able to be used, as suitable reference data exists across ENBs.

66. We note that the proposed target is to reflect the historical average. The current DPP quality limits equate to the historical average plus one standard deviation to reflect normal variation around the average.

67. This variation was debated at length when the DPP quality standards were first set. Without the buffer, ENBs have equal probability of exceeding or outperforming the target, assuming the target measures underlying reliability. As stated in the previous section, normalisation methods are critical to achieving fair underlying reliability measures.

68. Dead-bands were used to account for sampling variation in annual averages. The ENA considers that dead-bands are useful for recognising the inherent properties in the outage populations, and avoids unnecessary attention (and consequences) for normal variation around the mean.

69. The Quality Incentive Paper dismisses dead-bands for the quality targets as it is considered that natural variation is symmetric and will not unduly penalise, reward or create perverse incentives. We agree in principle that natural variation can be expected to be symmetric, but as submitted earlier, the proposed normalisation methods compromise this outcome because the measures remain unduly influenced by the frequency and severity of major events and the SAIDI performance is unduly influenced by SAIFI performance.

70. Further we do not consider that financial penalties or rewards are justified for small variances around the historical mean, as they introduce unnecessary pricing volatility for outcomes which have very little impact on the quality of service consumers will experience.

71. Accordingly the ENA submits that dead bands of +/- 0.2 standard deviation around the target should be implemented to avoid unnecessary pricing volatility for expected (and small variances) around the historical average.

4.1.2 Prior period breaches

72. The ENA does not support the proposed pro-rata adjustments for those ENBs which have breached their DPP quality standards. The proposed adjustments are internally inconsistent because they have been applied to normalised datasets which have different characteristics to the normalised datasets used to determine the breaches.

73. As demonstrated in the Quality Incentives Paper, and by evidence presented in the previous section, the normalisation methods unduly penalised some companies in the previous regulatory period (for example by establishing unreasonably high boundary values). These were contributing factors to breaches. We also consider that this proposal places undue weight on reliability performance in second half of the reference period.

74. The ENA considers that it is unduly retrospective to penalise ENBs for performance from a prior period, when determining the standards to apply for the next period, particularly where that performance has been examined and no fault or negligence on behalf of the ENB has been determined. This is contrary to natural justice, particularly as the penalties imposed are financial penalties on the ENB in the next regulatory period.

75. Accordingly, the ENA does not support the proposal to adjust downwards the reliability data in the reference dataset using a pro-rata method derived from prior period performance (which reflects different rules and methods).

4.1.3 Fixed targets

76. It is proposed that the targets are fixed for the entire regulatory period. The ENA supports this approach because it provides certainty. We do not believe that forward looking targets could be developed and implemented prior to the reset, particularly given the demands of developing low cost forecasting methods within the DPP.

77. We have considered rolling targets, based on updated reference datasets, but consider that this introduces unnecessary uncertainty into the quality standards, which is not appropriate for the initial financial incentive scheme.

4.2 Other features of reliability targets

4.2.1 Quality targets after asset transactions

78. We note the intention to provide for adjustments to quality of service standards for Transpower assets purchased, or other asset transactions within the regulatory period. We support this proposal as ENBs will take on responsibility for the performance of those assets, once ownership is transferred, or rescind responsibility once assets are sold.

79. We note that it appears that there has been no consideration of the service quality performance for Transpower's assets which have been, or are forecast to be, transferred prior to the next regulatory period. We submit that the historical performance of the assets for the entire reference period should be included when determining the quality of service targets, as this is the appropriate baseline against which future performance (ie: after the assets are transferred) should be assessed.

80. An adjustment for assets which are forecast to be transferred in the final year of the current regulatory period, where the transaction does not occur, could be introduced, similar to the proposed asset value wash up.

4.2.2 Re-opener events

81. It is proposed that a DPP is able to be re-opened following a catastrophic event. The ENA considers that reconsideration of the quality standards in addition to the price path, is appropriate in this instance.

82. Other re-opener events may also affect the quality standards and associated incentive scheme (such as an error in the information used to determine the quality standards).

83. As there are financial consequences for reliability performance under the proposed revenue incentive scheme, the ENA considers that the financial impact of the re-opener event, to the extent that it affects the quality incentive payments or rewards, should be considered when a DPP is re-opened.

84. The DPP Main Policy Paper proposes a new recoverable cost to allow for the recovery of the financial impact of a catastrophic event, for the period between the date of the event and the reset DPP. As we have submitted elsewhere, we consider that this recoverable cost should be extended to other re-opener events, including where they result in financial impacts through the incentive scheme.

4.3 Specifying the targets

85. We note that Schedule 3 of the DPP Draft Determination sets out the proposed process and specification of the quality targets and how the annual assessed values are to be calculated, and updated following a large transaction. The ENA plans to provide detailed comments on this drafting as soon as practicable.

4.4 Recommendations

86. For the purpose of specifying reliability targets, the ENA:

a) Supports implementing independent targets representing SAIDI (Class B and C) and SAIFI (Class B and C), as these measures represent quality which is valued by consumers, and good quality information is currently available for this purpose.

b) Notes that the proposed targets are to reflect historical averages which are more challenging targets than the quality standards in the current DPP which are set with reference to historical averages plus one standard deviation to reflect normal variation around the average.

c) Agrees with the Commission that natural variation can be assured to be symmetric and should not unduly penalise, reward or create perverse incentives, assuming that a suitable reliability target and normalisation method is implemented.

d) Submits that the proposed reliability targets do not meet these criteria because they are unduly influenced by the frequency and severity of major events.

e) Submits that dead bands of +/- 0.2 standard deviation around the target should be implemented to avoid unnecessary pricing volatility for expected (and small variances) around the historical average.

f) Does not support the proposed pro-rata adjustments for prior period breaches, which are derived using different reliability measures. In addition, this proposal unduly introduces financial penalties into the next regulatory period, for prior period performance, where no fault or negligence on the behalf of the ENBs concerned has been determined. The ENA considers that this proposal is contrary to the principles of natural justice.

g) Supports the proposal to maintain fixed quality targets for each ENB for the next regulatory period.

h) Support proposals to adjust targets following the purchase of spur assets or other transactions during the next regulatory period, and notes that historical reliability for spur assets purchased prior to the next regulatory period needs to be included when setting the targets.

i) Submits that DPP quality standards should be reconsidered following a re-opener event (including a catastrophic event) if necessary. In addition the impact of re-opener events on quality incentive payments should form part of the reconsideration of the DPP.

5. Revenue at risk

5.1 Proposed method

5.1.1 Determining revenue at risk

87. A cautious approach is proposed for the revenue at risk component of the quality incentive scheme, comprising 1% of the starting price maximum allowable revenue (MAR).

88. The ENA supports this approach for the initial quality incentive scheme. We note that Table 5.1 in the Quality Incentives Paper provides preliminary values for the revenue at risk for each ENB, based on the draft DPP price paths (to be updated once the price paths are finalised).

89. This table indicates that it is the FY16 MAR that is to be used to determine the revenue at risk for the entire regulatory period. The Draft DPP Determination however suggests (at Schedule 3, clause 15), that the revenue at risk is to be derived from allowable notional revenue (ANR) for each assessment period.

90. The ENA considers that a fixed amount is appropriate, given the targets are fixed and the financial incentive is lagged. We also submit that MAR is the appropriate measure, as it is not influenced by lagged quantities (in the same way ANR is).

91. We note that using FY16 MAR introduces potential anomalies for ENBs with alternative X factors, which may need to be considered by those ENBs before their price paths are determined. Another approach would be to use the MAR, prior to applying the alternative X factor, for those ENBs.

5.1.2 Allocation of revenue at risk

92. The revenue at risk is to be allocated equally between SAIDI and SAIFI. The ENA supports this proposal on the basis that both measures are valued by consumers, and there is insufficient evidence to suggest that differential weightings for these measures would be valued by consumers.

5.2 Recommendations

93. In determining the revenue at risk for the quality incentive, the ENA:

a) Supports the proposal to set revenue at risk as 1% of FY16 MAR, shared equally between SAIDI and SAIFI.

b) Notes further consideration of the use of the FY16 MAR values may be required for those ENBs with alternative X factors.

6. Caps, collars and incentive rates

6.1 Proposed method

6.1.1 Symmetric caps and collars

94. The ENA supports the proposal to apply symmetrical caps and collars for the incentive scheme, in the absence of evidence to suggest that either consumers value over/under performance differently, or suppliers should be rewarded/incentivised differently for over/under performance relative to the target.

6.1.2 Setting caps and collars

95. The ENA considers that setting the cap and collar at one standard deviation is a pragmatic approach which ensures the incentive rates are not too low. It also sets incentive boundaries within an expected performance range.

96. Setting the cap at one standard deviation above the historical average is consistent with the approach to setting the quality standard in the current DPP. We consider that that this approach sets a useful benchmark for assessing performance, when it falls outside an expected 'normal' range.

97. We note that the standard deviations will be expected to be lower for most ENBs than under the present arrangements, as the adjustment for zero event days in the boundary calculations, reduces the variability in the normalised reference datasets.

98. We note our comments in Section 4 regarding the application of a dead-band within the cap and collar range. The current approach to determining the reliability target retains significant exposure to the impact of extreme events, particularly for SAIDI and normal variation. For this reason we consider that dead-bands are appropriate as they will reduce the impact of small variances around the historical average, on the financial incentive payments.

6.1.3 Implied incentive rates

99. As the caps, collars and revenue at risk components of the incentive scheme are determined, the incentive rates are a by-product of the values for each of these for each ENB. This results in some variance between ENBs as to the financial incentives for marginal changes in reliability. We note that our proposal to introduce dead-bands around the targets increases the implied incentive rates, relative to the draft DPP quality standards.

100. The ENA acknowledges that consumers' willingness to pay, and the cost for suppliers of achieving incremental improvements in reliability are useful guidelines for determining incentive rates. Determining these values however requires a number of assumptions to be made (such as the value of lost load, or the costs of reliability improvement initiatives), and we consider that these may be suitable refinements for future regulatory periods.

6.2 Determining rewards and penalties

101. The method for determining the annual value of the financial reward or penalty is included in the Draft DPP Determination. We support the proposal to set out the method in the Determination, as this assists with understanding the likely impact of the incentive.

102. It is proposed that the financial reward/penalty is calculated at the end of each assessment period, and disclosed in Compliance Statements which are published within 50 working days of the end of the assessment period. The reward/penalty is then to be recovered through prices in the next assessment period (ie: the assessment period which commences after the publication of the Compliance Statement).

103. The ENA considers this a reasonable process, but notes that it may result in year on year variation in prices, which could be mitigated if a rolling balance approach was used (which permitted rewards and penalties to be offset in adjacent years). This approach is used in Australia.

104. The ENA also considers that a Time Value of Money (TVM) adjustment should be included in the reward/penalty, to maintain consistency with other deferred recoveries/rebates in the price path.

6.3 Recommendations

105. In specifying caps, collars and incentive rates for the quality incentive scheme, the ENA:

a) Supports the proposal to apply symmetrical caps and collars.

b) Considers that setting the cap and collar at one standard deviation is a pragmatic approach for the forthcoming regulatory period, as this approach sets a useful benchmark for assessing performance which is outside an expected 'normal' range.

c) Submits that dead-bands should be included around the target, unless the normalisation methods are corrected in the manner outlined in this submission.

d) Notes that the incentive rates are a by-product of the caps, collars and revenue at risk values, and are influenced by our proposal for a dead-band around the targets.

e) Acknowledges that consumers' willingness to pay, and the cost for suppliers of achieving incremental improvements in reliability are useful guidelines for determining incentive rates. The ENA considers that these may be suitable refinements for setting incentive rates for future regulatory periods.

f) Supports the proposed process for determining, publishing and recovering/passing on the financial incentive subject to including a time value of money adjustment to the deferred incentive recovery/rebate.

g) Considers a rolling balance approach to minimise year on year pricing variation is a useful improvement to the proposal.

7. Compliance and Enforcement

7.1 Proposals increase uncertainty

7.1.1 Defining non-compliance

106. The Quality Incentives Paper suggests that a benefit of the proposed revenue linked incentive scheme is that it helps reduce uncertainty for distributors and consumers, as there will be more certainty as to how the Commission will assess and enforce compliance with reliability standards.

107. In terms of assessing compliance with the quality scheme, it is proposed that:

a) Performance above the target is deemed non-compliant

b) No enforcement action is envisaged where performance is under the cap, except in exceptional circumstances

c) Pecuniary penalties may be sought in addition to financial penalties which arise from the incentive scheme.

108. In our view this greatly reduces regulatory certainty relative to the current DPP quality standards. It places non-exempt ENBs in a position where they have equal probability of complying or not complying in every year of the regulatory period on either target, assuming variances around the targets are symmetric (as suggested they should be at paragraph 4.15.2 of the Quality Incentives Paper).

109. Accordingly, the ENA strongly opposes this proposed approach to determining compliance with the quality standard because:

a) It ignores the natural variation in reliability performance

b) It is contrary to the intent of the incentive scheme which is to allow choice (with financial consequences) to operate above or below the target, to better reflect how consumers value reliability

c) It significantly increases the standard of compliance for ENBs relative to current DPP, with no financial compensation

d) It reduces regulatory certainty, as (assuming annual performance is symmetrical around the average) half of the non-exempt ENBs will be non-compliant every year, on each measure

e) In addition to the financial penalties in the incentive, pecuniary penalties or criminal charges, may be imposed in exceptional circumstances within the cap (ie: within the bounds of expected normal performance), and in other circumstances if the cap is exceeded.

7.1.2 Undue compliance risk

110. Intentionally contravening price-quality regulation has serious consequences for suppliers. Part 4 of the Commerce Act sets out the penalties for suppliers who contravene the requirements of applicable price-quality regulation, as follows:

> ***87 Pecuniary penalty for contravening price-quality requirement***
>
> *(2) In subsection (1) and sections 87A to 87C, a reference to contravening a price-quality requirement—*
>
> > *(a) refers to a requirement imposed by a determination made under section 52P in relation to goods or services that are subject to default/customised price-quality regulation or to individual price-quality regulation imposed under Part 4; and*
> >
> > *(b) means either or both of the following:*
> >
> > > *(i) failing to comply with the requirements for prices, whether by charging a price for the goods or services that is higher than the maximum price permitted, or by receiving more revenue than is permitted, or in any other way:*
> > >
> > > *(ii) refusing or failing to comply with any quality standards required under the price-quality regulation.*
>
> ***87B Offence relating to price quality regulation***
>
> *(1) A person commits an offence if—*
>
> > *(a) the person, knowing that particular goods or services are subject to price-quality regulation, intentionally contravenes a price-quality requirement in respect of the goods or services; or*
> >
> > *(b) the person is subject to an order under section 87C(1)(b) and fails to comply with the order.*
>
> *"(2) A person who commits an offence under subsection (1) is liable on summary conviction to a fine not exceeding $200,000 in the case of an individual, or $1,000,000 in the case of a body corporate.*
>
> *"(3) Despite section 14 of the Summary Proceedings Act 1957, proceedings for an offence under subsection (1)(a) may be commenced at any time within 3 years after the contravention occurred.*

111. In years where reliability performance is above the target, ENBs will know they will not be able to comply with the quality target and are unlikely to be able to take action to avoid non-compliance. This is an unreasonable expectation to place on the Directors of ENBs who ultimately are responsible for acting within the legislation.

112. Even if they could, this is not the intent of the revenue incentive scheme, which is to impose financial penalties for non-compliance. Accordingly the ENA considers that proposed compliance standard is unreasonable, and inconsistent with the serious consequences set out in the Act for contravening price-quality regulation.

7.2 Suitable compliance standard

113. The ENA considers that the financial penalties imposed on ENBs where quality performance exceeds the targets should be taken into consideration when determining compliance and enforcement action.

114. Accordingly, we submit that the quality incentive cap is the appropriate benchmark, as this indicates when reliability performance falls outside the expected range of 'normal' performance and it is the point where the incentive scheme ceases to apply a marginal penalty. Thus non-compliance should only be considered where annual assessments exceed the cap, subject to the additional criteria discussed below.

115. In addition, in order to maintain consistency with the 'no material deterioration' standard which underpins price-quality regulation for ENBs, the ENA considers that the two out of three year test should be retained (applied across SAIDI and SAIFI measures). This is a better way of identifying potential deterioration than a single year observation. The ENA considers this test has worked reasonably well in the current regulatory period. It has resulted in four breaches to date, which have been investigated and no material deterioration identified.

116. We consider that the financial penalty in the scheme adequately addresses any reduced performance which falls within the cap, and thus no further action is required within the cap. This is an improvement for consumers relative to the current pass/fail approach, which provides no penalty for reliability performance which exceeds the average, but falls below the standard deviation buffer.

7.3 Recommendations

117. The ENA does not support the proposed compliance and enforcement standards for the quality incentive scheme and submits that the proposal:

a) Greatly increases regulatory uncertainty.

b) Places ENBs in a position of having equal probability (assuming symmetrical variation around the historical average) of being compliant or non-compliant in every year, on either target.

c) Is inconsistent with the serious consequences for non-compliance with price-quality regulation within the Commerce Act.

d) Is inconsistent with the intent of the incentive regime which is to allow quality performance to improve or reduce to reflect consumer preferences.

e) Significantly increases the compliance standard relative to the current DPP, with no financial compensation for ENBs.

118. The ENA submits that non-compliance with the quality standards should be determined where annual performance exceeds the cap (on either measure), two out of three years in a row. This recognises the role of the financial penalty for performance under the cap, and appropriately seeks to identify material deterioration in performance.

Attachment A – IEEE Beta Method

In a 2003 journal article,[10] IEEE member Richard Christie set out a method for calculating the MED boundary (under what would become the IEEE 'Beta Method') which explicitly accounts for the number of zero event days in the historical dataset. Christie had previously described this method in working papers.

This method has previously been considered in the context of DPP regulation. For example SRA stated, in a 2009 submission to the Commission on behalf of the ENA, that this article is "*the most authoritative and reliable reference which correctly accounts for zero SAIDI days.*"[11]

The method developed by Christie involves an adjustment to the IEEE standard method which assumes no zero event days.

Calculating the MED threshold without accounting for zero event days

Under the IEEE Beta Method, the MED threshold T_{MED} is calculated using the following steps:

- All zero event days are removed from the historical dataset
- It is assumed that the daily SAIDI values, r_i, are log-normally distributed
- The mean and standard deviation of the natural logarithms of the dataset are determined as follows:

$$\text{mean} = \alpha = \frac{1}{n}\sum_{i=1}^{n} ln(r_i)$$

$$\text{standard deviation} = \beta = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(\alpha - \ln(r_i))^2}$$

- The threshold is the value of T_{MED} such that:

$$p(\text{MED}) = 0.0062$$

$$p(r > T_{MED}) = 1 - p(r < T_{MED}) = 0.0062$$

- This can be found by solving the integral of the log-normal distribution's probability density function (pdf) for T_{MED}:

[10] Christie, R. D. (2003), Statistical Classification of Major Event Days in Distribution System Reliability, *IEEE Transactions on Power Delivery*, 18(4): 1336-1341.

[11] Statistics Research Associates Ltd (Thomson, P.) (October 2009), *Comments on Chapter 7 and Appendix C of the Commerce Commission Draft Decisions Paper: Initial Reset of the Default Price-Quality Path for Electricity Distribution Businesses (8 September 2009)*, page 3.

$$1 - p(r < \mathrm{T}_{MED}) = 0.0062 = 1 - \int_0^{\mathrm{T}_{MED}} \frac{1}{\sqrt{2\pi}\beta x} e^{-\frac{(\ln x - \alpha)^2}{2\beta^2}} dx$$

$$= 1 - \phi\left(\frac{\ln \mathrm{T}_{MED} - \alpha}{\beta}\right)$$

where φ is the normal distribution's cumulative probability density function (cdf)

- Hence:

$$\mathrm{T}_{MED} = e^{\alpha + \beta\phi^{-1}(0.0062)} = e^{\alpha + 2.5\beta}$$

Adjustment for the number of zero event days

The calculation set out above ignores days where r_i=0. They cannot be included in the log-normal distribution because the value of ln(0) is undefined. They must be treated as a lumped probability at zero.

If there are no zero values, the area under the log-normal pdf represents 100% of the probability. Where zero values exist, these values represent probability that is lumped at zero, and which is not under the log-normal pdf – in which case the area under the log-normal pdf is less than 100% of the total probability.

For example, where there are 4 zero event days in a year-long historical dataset, then

$$p(0) = \frac{4}{365} = 1.01\%$$

This means that the area under the log-normal pdf only represents 98.99% of the total probability.

To account for this, T_{MED} must be set such that the area under the pdf and above T_{MED} is the desired overall probability (ie 0.0062) increased by the ratio of the area under the pdf to the probability that a day is non-zero. That is:

$$p(r > \mathrm{T}_{MED}) = 0.0062 \times \frac{1}{1 - p(0)} = 0.0062 \times \frac{1}{1 - \left(\frac{number\ of\ zero\ event\ days}{total\ number\ of\ days\ in\ dataset}\right)}$$

The formula for T_{MED} therefore becomes:

$$\mathrm{T}_{MED} = e^{\alpha + \beta\phi^{-1}\left(0.0062 \times \frac{1}{1 - p(0)}\right)}$$

If there are no zero event days in the historical dataset, then this formula simplifies to the current IEEE Beta Method (as set out above).

Where there are zero event days, this adjustment reduces the coefficient on β, which in turn reduces T_{MED} (with a greater reduction for networks with a greater number of zero event days).

Attachment B – Determining Boundary Values

	Number of Event Days (2005-2014)	SAIDI Boundary			SAIFI Boundary		
		Current (IEEE standard) method	Proposed DPP method	IEEE adjusted method	Current (IEEE standard) method	Proposed DPP method	IEEE adjusted method
Alpine Energy	912	39.67	14.03	14.21	0.34	0.13	0.13
Aurora Energy	2,141	17.35	11.10	11.16	0.41	0.26	0.27
Centralines	1,037	30.29	10.85	10.99	1.96	0.76	0.77
EA Networks	1,413	18.21	8.97	9.08	0.22	0.11	0.11
Eastland Network	1,470	30.28	17.12	17.31	0.38	0.21	0.22
Elec. Invercargill	207	43.80	4.18	4.25	1.55	0.12	0.12
Horizon Energy	789	51.67	17.80	18.01	0.70	0.25	0.25
Nelson Electricity	67	253.53	2.06	2.13	3.64	0.04	0.04
Network Tasman	996	63.48	18.98	19.27	0.46	0.16	0.17
OtagoNet JV	1,309	32.55	14.87	15.06	0.41	0.20	0.20
Powerco	3,491	11.73	11.31	11.42	0.14	0.13	0.13
The Lines Co	2,754	21.02	16.83	17.03	0.40	0.32	0.32
Top Energy	1,704	68.34	39.51	39.95	1.16	0.64	0.65
Unison Networks	1,955	27.27	16.00	16.21	0.25	0.17	0.17
Vector	3,255	10.78	9.88	9.99	0.15	0.14	0.14
Wellington Electricity	1,349	15.68	6.76	6.85	0.26	0.11	0.11

Attachment C – Normalising Major Event Days

2005-2014	SAIDI MEDs to be Normalised			SAIFI MEDs to be Normalised		
	Current method (SAIDI trigger)	Proposed method (SAIFI trigger)	ENA's proposed method (SAIDI trigger)	Current method (SAIDI trigger)	Proposed method (SAIFI trigger)	ENA's proposed method (SAIFI trigger)
Alpine Energy	12	5	12	5	6	6
Aurora Energy	4	0	4	0	0	0
Centralines	20	4	20	4	17	17
EA Networks	20	14	20	14	17	17
Eastland Network	15	4	15	4	16	16
Elec. Invercargill	18	6	18	6	14	14
Horizon Energy	6	1	6	1	4	4
Nelson Electricity	26	21	26	21	22	22
Network Tasman	2	1	2	1	4	4
OtagoNet JV	20	8	20	8	18	18
Powerco	22	2	22	2	2	2
The Lines Co	17	3	17	3	6	6
Top Energy	15	5	15	5	5	5
Unison Networks	9	2	9	2	3	3
Vector	8	3	8	3	3	3
Wellington Electricity	5	2	5	2	2	2
Total	**219**	**81**	**219**	**81**	**139**	**139**

Attachment D – Examples of Excluded SAIDI MEDs

The table below shows a small sample of the 138 SAIDI MEDs which are excluded from the proposed extreme event day normalisation process, due to the daily SAIFI value being lower than the SAIFI boundary, despite each network experiencing severe weather events on those days.

Schedule of MEDs

EDB	Disclosure year	Date	SAIDI	SAIFI	BSAIDI	BSAIFI	Event Description
Alpine Energy	2011	08-Aug-2010	15.79	0.06	14.03	0.13	Snow storm
Alpine Energy	2011	05-Sep-2010	19.05	0.06	14.03	0.13	Wind storm
Alpine Energy	2011	21-Dec-2010	15.06	0.09	14.03	0.13	Wind storm
EA Networks	2008	14-Jan-2008	10.96	0.07	8.98	0.11	Adverse weather caused 33kV faults
EA Networks	2009	04-Oct-2008	10.53	0.06	8.98	0.11	Trees and weather
EA Networks	2012	15-Aug-2011	11.46	0.10	8.98	0.11	Snow, wind and lightning
Eastland Network	2005	30-Jun-2004	19.16	0.19	17.13	0.21	Adverse weather, tree contacts
Eastland Network	2005	01-Jul-2004	32.11	0.14	17.13	0.21	Adverse weather, tree contacts
Eastland Network	2006	21-Oct-2005	26.87	0.05	17.13	0.21	Slips, trees, adverse environment
Eastland Network	2007	12-Jun-2006	32.71	0.12	17.13	0.21	Adverse weather, tree contacts
Eastland Network	2009	07-Oct-2008	22.34	0.10	17.13	0.21	Adverse weather, high winds
OtagoNet	2005	21-Sep-2004	17.90	0.09	13.43	0.16	High winds
OtagoNet	2007	02-Sep-2006	28.74	0.11	13.43	0.16	Gale force winds
Powerco	2005	18-Aug-2004	16.13	0.06	11.31	0.13	Adverse weather and tree contacts
Powerco	2008	10-Jul-2007	122.20	0.10	11.31	0.13	Adverse weather

Attachment E – Alternative Targets, Caps and Collars

The following tables show revised targets, caps and collars (as well as dead-bands) using our proposed approach to normalisation (where SAIDI and SAIFI MED normalisation is independent and MEDs are adjusted by applying the average of non MED event days).

	SAIDI targets, caps and collars								
	Draft DPP				ENA Proposal (MED replaced with average)				
	Collar	Target	Cap	Incentive rate $	Collar	Target	Cap	Deadband+/ - 0.2 std dev	Incentive rate $
Alpine Energy	78.77	147.60	216.44	1,358	84.99	125.02	165.06	8.01	2,919
Aurora Energy	61.41	86.80	112.20	5,570	67.34	77.43	87.51	2.02	17,539
Centralines	100.94	137.19	173.44	779	81.31	104.17	127.03	4.57	1,545
EA Networks	109.27	139.55	169.83	2,817	96.56	117.83	139.11	4.26	3,560
Eastland Network	206.03	246.60	287.16	1,494	184.19	225.47	266.74	8.26	2,584
Elec. Invercargill	17.51	29.16	40.80	3,155	13.45	20.23	27.01	1.36	6,774
Horizon Energy	124.54	170.64	216.73	1,207	127.67	150.62	173.56	4.59	3,031
Nelson Electricity	5.55	15.13	24.70	1,803	1.45	10.42	19.40	1.80	2,403
Network Tasman	102.54	126.03	149.52	3,058	97.53	118.04	138.56	4.10	4,376
OtagoNet JV	171.51	233.61	295.70	956	149.94	194.01	238.09	8.81	1,683
Powerco	166.19	222.32	278.44	11,427	149.43	165.42	181.40	3.20	50,148
The Lines Co	201.33	238.81	276.30	2,389	169.11	193.03	216.96	4.78	4,679
Top Energy	364.24	445.99	527.75	1,224	308.93	369.69	430.45	12.15	2,058
Unison Networks	87.55	111.43	135.31	10,480	82.13	98.80	115.48	3.33	18,762
Vector	81.52	106.64	131.77	39,479	79.99	95.74	111.48	3.15	78,773
Wellington Electricity	24.92	37.12	49.31	20,601	29.16	37.15	45.15	1.60	39,262

	SAIFI targets, caps and collars								
	Draft DPP				ENA Proposal (MED replaced with average)				
	Collar	Target	Cap	Incentive rate $	Collar	Target	Cap	Deadband+/ - 0.2 std dev	Incentive rate $
Alpine Energy	1.09	1.37	1.65	332,857	1.08	1.30	1.53	0.05	517,322
Aurora Energy	1.14	1.37	1.60	628,432	1.15	1.37	1.60	0.05	785,540
Centralines	2.72	4.05	5.38	21,246	2.37	3.66	4.95	0.26	27,419
EA Networks	1.11	1.41	1.71	282,648	1.02	1.24	1.45	0.04	356,018
Eastland Network	2.82	3.15	3.47	185,653	2.55	2.85	3.16	0.06	348,943
Elec. Invercargill	0.41	0.65	0.89	151,820	0.33	0.53	0.72	0.04	235,102
Horizon Energy	1.76	2.04	2.32	202,075	1.71	1.95	2.19	0.05	285,186
Nelson Electricity	0.11	0.20	0.28	196,787	0.07	0.13	0.18	0.01	387,957
Network Tasman	1.17	1.34	1.52	410,019	1.10	1.28	1.46	0.04	503,381
OtagoNet JV	1.87	2.30	2.74	137,405	1.77	2.10	2.43	0.07	223,755
Powerco	1.69	2.17	2.65	1,341,530	1.68	2.15	2.61	0.09	1,727,940
The Lines Co	2.47	3.21	3.95	120,982	2.38	3.14	3.89	0.15	148,203
Top Energy	3.97	5.59	7.21	61,632	4.08	5.28	6.48	0.24	103,906
Unison Networks	1.50	2.05	2.61	450,792	1.45	2.00	2.55	0.11	566,480
Vector	0.99	1.33	1.66	2,996,978	1.00	1.28	1.57	0.06	4,359,763
Wellington Electricity	0.37	0.53	0.69	1,565,233	0.46	0.57	0.67	0.02	2,952,635

The following tables show revised targets, caps and collars (as well as dead-bands) using our proposed approach to normalisation (where SAIDI and SAIFI MED normalisation is independent and MEDs are adjusted by applying the average of non MED event days, apart from the first two MEDs per year, to which the boundary value is applied).

	SAIDI targets, caps and collars								
	Draft DPP				ENA Proposal (First 2 MEDs per year replaced with boundary, then average)				
	Collar	Target	Cap	Incentive rate $	Collar	Target	Cap	Deadband+/ - 0.2 std dev	Incentive rate $
Alpine Energy	78.77	147.60	216.44	1,358	87.21	136.82	186.44	9.92	2,355
Aurora Energy	61.41	86.80	112.20	5,570	66.65	81.72	96.79	3.01	11,734
Centralines	100.94	137.19	173.44	779	92.08	117.57	143.07	5.10	1,385
EA Networks	109.27	139.55	169.83	2,817	107.02	129.80	152.58	4.56	3,325
Eastland Network	206.03	246.60	287.16	1,494	206.21	246.23	286.25	8.00	2,664
Elec. Invercargill	17.51	29.16	40.80	3,155	16.92	24.61	32.30	1.54	5,969
Horizon Energy	124.54	170.64	216.73	1,207	129.17	160.36	191.54	6.24	2,230
Nelson Electricity	5.55	15.13	24.70	1,803	4.29	13.49	22.68	1.84	2,346
Network Tasman	102.54	126.03	149.52	3,058	103.74	121.70	139.66	3.59	4,999
OtagoNet JV	171.51	233.61	295.70	956	164.80	211.73	258.66	9.39	1,581
Powerco	166.19	222.32	278.44	11,427	162.56	183.01	203.46	4.09	39,202
The Lines Co	201.33	238.81	276.30	2,389	190.34	214.54	238.75	4.84	4,624
Top Energy	364.24	445.99	527.75	1,224	351.87	418.97	486.06	13.42	1,864
Unison Networks	87.55	111.43	135.31	10,480	87.35	105.13	122.91	3.56	17,590
Vector	81.52	106.64	131.77	39,479	81.81	103.51	125.21	4.34	57,149
Wellington Electricity	24.92	37.12	49.31	20,601	29.47	39.79	50.10	2.06	30,446

	SAIFI targets, caps and collars								
	Draft DPP				ENA Proposal (First 2 MEDs per year replaced with boundary, then average)				
	Collar	Target	Cap	Incentive rate $	Collar	Target	Cap	Deadband+/ - 0.2 std dev	Incentive rate $
Alpine Energy	1.09	1.37	1.65	332,857	1.09	1.37	1.66	0.06	414,757
Aurora Energy	1.14	1.37	1.60	628,432	1.15	1.37	1.60	0.05	785,540
Centralines	2.72	4.05	5.38	21,246	2.61	3.97	5.33	0.27	25,988
EA Networks	1.11	1.41	1.71	282,648	1.12	1.35	1.58	0.05	332,172
Eastland Network	2.82	3.15	3.47	185,653	2.77	3.07	3.38	0.06	351,291
Elec. Invercargill	0.41	0.65	0.89	151,820	0.41	0.64	0.86	0.05	203,459
Horizon Energy	1.76	2.04	2.32	202,075	1.77	2.04	2.32	0.06	252,102
Nelson Electricity	0.11	0.20	0.28	196,787	0.11	0.18	0.24	0.01	331,759
Network Tasman	1.17	1.34	1.52	410,019	1.17	1.34	1.52	0.04	511,982
OtagoNet JV	1.87	2.30	2.74	137,405	1.87	2.29	2.71	0.08	176,006
Powerco	1.69	2.17	2.65	1,341,530	1.69	2.17	2.65	0.10	1,676,346
The Lines Co	2.47	3.21	3.95	120,982	2.47	3.21	3.95	0.15	151,223
Top Energy	3.97	5.59	7.21	61,632	4.07	5.53	6.99	0.29	85,787
Unison Networks	1.50	2.05	2.61	450,792	1.50	2.05	2.61	0.11	563,471
Vector	0.99	1.33	1.66	2,996,978	0.99	1.33	1.66	0.07	3,739,937
Wellington Electricity	0.37	0.53	0.69	1,565,233	0.43	0.59	0.75	0.03	1,955,892