

Efficient procurement of extended reserves - response paper to the second consultation

Executive summary

This paper records all the submissions made to the Authority's January 2014 consultation on revised procurement approaches for AUFLS (and other extended reserves), and sets out the Authority's response to the issues raised.

The majority of submitters agreed with the proposed approach, although others believed other approaches were more suitable, and some others raised concerns about the cost and practicability of the proposed approach.

The Authority has considered all the submissions raised, as input to refining its proposed approach in particular areas, and revising the cost-benefit analysis it uses to assess which option is likely to deliver the greatest net benefit for consumers.

Overall, the Authority continues to be of the view that the preferred approach proposed in the January 2014 consultation will deliver the greatest net benefit for consumers. However, it notes that a number of matters of detail remain to be finalised, and it will continue to work with the system operator and stakeholders to ensure that the final arrangements deliver the best long-term outcome for consumers.

Glossary of abbreviations and terms

Act	Electricity Industry Act 2010
AUFLS	Automatic Under-Frequency Load Shedding
Authority	Electricity Authority
CBA	Cost-benefit analysis
Code	Electricity Industry Participation Code 2010
CRE	Competition, reliability, and efficiency. The three components of the Authority's statutory objective under the Act (to promote competition in, reliable supply by, and the efficient operation of, the New Zealand electricity industry for the long-term benefit of consumers)
DD	Dispatchable demand, a regime which enables demand-side participants to participate more fully in the wholesale electricity market
Direct consumer	an electricity consumer with a point of connection to the national grid
Distributor	a party who conveys electricity on lines other than lines that are part of the national grid (the term Distributor includes Direct Consumers for the purposes of Part 8 of the Code)
DR	Demand response, a generic term that encompasses a variety of responses from the demand-side including interruptible load, control of hot-water heating load by distributors and peak period load control
Extended reserve	Services provided by selected asset owners to restore frequency to the normal band after disturbances of a magnitude that makes it impracticable or uneconomic to restore frequency using ancillary services (currently AUFLS is the only extended reserve service)
ERM	Extended reserve manager, a proposed new service provider that will establish the selection methodology and undertake the selection process
Extended reserve provider	An asset owner required to provide extended reserve under Schedule 8.3, Technical Code B, clause 7 of the Code

Extended reserve selection methodology	The methodology by which extended reserves will be procured, developed by the ERM and approved, following consultation, by the Authority
Extended reserve technical requirements schedule	The technical requirements schedule prepared and published by the system operator (and reviewed at least every five years), setting out the technical requirements for extended reserves (including AUFLS) as indicated in the extended reserve technical requirements report
GXP	Grid exit point, typically a point of connection on the grid at which electricity predominantly flows out of the grid
Hz	Hertz, the unit of measure for frequency
IL	Interruptible Load, a form of IR
IR	Instantaneous Reserve, an ancillary service the system operator contracts for to assist in managing frequency disturbances outside the normal band
Load	a consumer's demand for electricity, or the collective demand across a group of consumers
Lines company	an alternative term for Distributor
MUoSA	Model use of system agreement
Normal band	the frequency band between 49.8 Hertz and 50.2 Hertz
NPV	Net present value
PPOs	Principal Performance Obligations, the system operator obligations in Clause 7.2 of the Code
PROPs	Participant rolling outage plans, required under Part 9 of the Code as part of the arrangements for management and co-ordination of planned outages as an emergency measure during energy shortages
Regulations	Electricity Industry (Enforcement) Regulations 2010
system operator	Transpower NZ Ltd, in its role as the service provider under the Act and Code responsible for ensuring the real-time co-ordination of the electricity system
system collapse	Failure in the interconnected electricity system, generally caused when the failure of one part of the system triggers the failure of successive parts

UFM	Under-frequency management
UoSA	Use of system agreement
VoLL	Value of lost load

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1. Introduction

- 1.1.1 This paper records all the submissions made to the January 2014 consultation on revised procurement approaches for AUFLS, and sets out the Authority's response to the issues raised.
- 1.1.2 The Authority issued the first consultation paper "*Efficient procurement of extended reserves*" in October 2012.¹ The paper outlined a range of potential options, from a simple centrally-coordinated approach through to highly complex market arrangements.
- 1.1.3 Subsequent analysis during the course of 2013 resulted in further issues being identified, and additional procurement options were developed in addition to those set out in the first consultation.
- 1.1.4 The procurement options that were identified are set out in Table 1 below:

Table 1: AUFLS procurement options

High-level family	Sub-variant
1) Common AUFLS percentage obligation	1.a) Standard Code mechanisms (equivalence, dispensations and exemptions) used to vary individual stakeholders provision away from the common percentage requirement.
	1.b) As above, plus prioritised block coordination (enabling high value load to be put in AUFLS block 4 rather than block 1, ² and allowing small stakeholders to provide a single block of 32%, rather than four blocks of 10%:10%:6%:6%.)
	1.c) As above, plus special exclusions to exempt certain stakeholders, including: exempting direct connects from any obligation and allowing IL to be counted towards meeting an AUFLS obligation
	1.d) As above, plus profiled minimum and maximum obligations (i.e. varying the percentage obligation by time of day and year, and penalising for over-provision as well as under-provision.)

¹ <http://www.ea.govt.nz/dmsdocument/13764>

² Initial analysis suggests that the return period of the first block being called upon would likely be approximately one in five years, whereas the return period of the fourth block being called upon could be of the order of one in 50 years.

High-level family	Sub-variant
2) Varying AUFLS provision via optimisation (the amount each stakeholder provides will be based on the relative suitability of the load)	2.a) No compensation, plus central VoLL estimation of lines companies' load
	2.b) With compensation, plus central VoLL estimation of lines companies' load
	2.c) With compensation, plus lines companies' VoLL estimation of lines companies' load
3) Voluntary AUFLS tender	3.a) Simple pay-as-bid tender
	3.b) 'Sophisticated' AUFLS market

1.1.5 Following the completion of the system operator's technical analysis,³ the Authority and the system operator held a series of stakeholder workshops in October 2013.⁴ The proposed technical solution was presented in detail and the range of different procurement options was discussed.

1.1.6 Having considered all the stakeholder input on the relative pros and cons of the different procurement options, the Authority identified a preferred option for the procurement of AUFLS as an 'extended reserves' product. This was shown in the table above as option 2.b) *Varying AUFLS provision via optimisation, with compensation plus central VoLL estimation of lines companies' load*. The Authority consulted on its preferred option for procurement in January 2014.⁵

1.1.7 The high-level design elements of this option were set out in the consultation as follows:

- (a) an obligation on transmission-connected stakeholders to provide information to an AUFLS selection process. This information would include:
 - (i) historical load patterns

³ [http://www.systemoperator.co.nz/sites/default/files/bulk-upload/documents/20130807%20AUFLS%](http://www.systemoperator.co.nz/sites/default/files/bulk-upload/documents/20130807%20AUFLS%20review%20report.pdf)

⁴ <http://www.systemoperator.co.nz/market/development/current-projects/automatic-under-frequency-load-shedding-aufls-review#prvfid-977> and <http://www.ea.govt.nz/dmsdocument/15989>

⁵ <http://www.ea.govt.nz/dmsdocument/16319>

- (ii) likelihood of load being used for other demand-side purposes (DD,DR, IR)
 - (iii) VoLL
 - (iv) whether the load has existing AUFLS relay capabilities.
- (b) the system operator to use an optimisation tool to process such information, and select the optimal mix of loads to provide AUFLS
- (c) a requirement on selected stakeholders to arm their load to the AUFLS setting determined by the optimisation process (i.e. whether to arm the selected load for AUFLS block one, block two and so on)
- (d) selected stakeholders (the ones that are required to arm load) to receive compensation payments to cover the cost of providing AUFLS relays, and the expected cost of load interruption from AUFLS events
- (e) the cost of such compensation payments to be recovered from all transmission-connected stakeholders in proportion to their annual demands
- (f) the system operator to repeat such a process at intervals it deems to be appropriate, but at least once every five years. Any future 'adjustment optimisations' would be unlikely to significantly change the AUFLS requirements on stakeholders, except if the NZ electricity system has materially changed.

2. The Authority has reviewed the submissions made by stakeholders to the January 2014 consultation

2.1.1 Eleven stakeholders made submissions to the January 2014 consultation paper, as indicated by the following table

Lines companies	Direct connects	Retailers	Other
Northpower Orion Powerco Vector	MEUG NZ Steel Norske Skog Pacific Aluminium	Contact Meridian	Transpower

2.2 Key issues raised by each submitter

2.2.1 Appendix A and Appendix B detail the submissions made by stakeholders in response to the questions set out in the consultation.

2.2.2 All parties agreed with the key issue behind the development of revised arrangements, namely that a one-size-fits-all common obligation approach would deliver poor outcomes. All parties also agreed that a voluntary market-based approach to procuring AUFLS would be impracticable – in large part because of the inability of lines companies to engage in such a market due to not having the contractual rights to do so under their use of system agreements with their customers.

2.2.3 However, submitters raised a number of other issues. These are summarised below (in alphabetical order of submitter).⁶

Contact Energy

2.2.4 Supportive

2.2.5 Only substantive comment was that it was supportive of proposed compensation approach, but didn't want to see an AUFLS event charge as a means of cost allocation.

⁶ Some submitters addressed many different issues relating to the many different questions in the consultation. What is presented in this summary is the Authority's understanding of the key issues raised by submitters. What constitutes a 'key' issue is necessarily a subjective evaluation, but the Authority has attempted as best it can to address the twin (but sometimes conflicting) requirements of: (i) accurately representing submitters' positions; while (ii) distilling these various positions into the key issues which will have a bearing on the choice and design of the best AUFLS procurement approach.

MEUG

- 2.2.6 Supportive, but with two suggested changes:
- (a) allow large industrial loads on dedicated lines company feeders to opt out of the lines company obligation, and be treated in same way as direct connects
 - (b) have an exacerbator-pays rather than a beneficiary-pays approach to cost allocation (i.e. have Transpower & large generators pay, not loads), as it believes this would result in more efficient outcomes.

Meridian

- 2.2.7 Supportive.

NZ Steel

- 2.2.8 Supportive, except believes there should be an exacerbator-pays rather than beneficiary-pays approach for cost allocation.

Norske Skog

- 2.2.9 Assumed from the information provided in the consultation that the model was a deterministic approach, and was therefore sceptical about whether it would work. Believed a stochastic model would be more appropriate. [Note: In fact the model is closer to a stochastic approach than a deterministic approach.]
- 2.2.10 Believes it would be more appropriate to continue with approach where direct connects are permanently exempted from need to provide AUFLS.

Northpower

- 2.2.11 Believes it would be more pragmatic to have a common obligation, coupled with special exclusions to exempt direct connects (and potentially small lines companies), and some form of system operator coordination.
- 2.2.12 This is effectively options 1.c) or 1.d) in Table 1 above.
- 2.2.13 Doesn't agree that using 'market forces' within a central optimisation approach which takes account of relative VoLLs is a 'fair or reasonable' means to achieve outcome of not requiring refinery to provide AUFLS.

Orion

- 2.2.14 Believes a more appropriate approach would be to:

- (a) use exemptions to exclude direct connect loads where economically appropriate
- (b) have most small lines companies (and presumably any non-exempted direct connects) provide a very standard levels of AUFLS
- (c) enable the system operator to require some large lines companies to provide a more complex set of AUFLS, such as by:
 - (i) varying the amount of AUFLS provided by season and time of day
 - (ii) progressively move to provide 'automated real-time' AUFLS to meet changing real-time requirements.

2.2.15 Stated that "almost all" lines companies should be able to provide at least 32% of their load for AUFLS from low VoLL customers.

2.2.16 This is effectively option 1.d) in Table 1 above.

2.2.17 Is concerned that the proposed central optimisation approach may conflict with other DSM initiatives that may emerge in the market later.

2.2.18 Also believes the consultation did not provide sufficient detail on:

- (a) how to address coordination between AUFLS and rolling outages
- (b) how to address coordination between AUFLS and IL / DR
- (c) how AUFLS-related costs and revenues would be treated under Commerce Commission regime.

Pacific Aluminium

2.2.19 Only addressed the issue of whether a causer-pays approach would deliver better outcomes than a beneficiary-pays approach. Pacific Aluminium Supports the MEUG position of causer-pays.

Powerco

2.2.20 Conditional support, subject to seeing the detailed specifics of the optimisation approach.

2.2.21 Believes that the timetable for implementing new AUFLS scheme is too tight, given its scarce technician resource to make the changes on its 290 feeders which currently have AUFLS relays.

2.2.22 Suggested that the ability to undertake real-time arming / disarming likely exists to a greater degree than the Authority believes, due to Powerco already having invested significantly in SCADA-based controls in its network.

Transpower

- 2.2.23 Suggested it may be appropriate to move ahead now with the revised technical approach, but address the appropriate procurement approach as a subsequent 'stage two'. This is to ensure that achieving the technical gains are not delayed due to delays in developing and implementing the revised procurement approach.
- 2.2.24 Believes the optimisation tool should be specified, developed, and audited to same level of rigor as other system tools such as SPD.

Vector

- 2.2.25 Agrees in principle, but has concerns that the proposal will not work in practice. In particular, it believes:
- (a) the compensation mechanism will not act to incentivise parties to invest in more sophisticated AUFLS technologies due to the way in which the Commerce Commission would likely treat such costs and payments. Without these incentives, Vector is concerned the scale of desired benefits will not materialise
 - (b) the process will impose information costs on participants and operating costs on the system operator. These may not be justified if the benefits are not realised because of the concerns outlined above.
- 2.2.26 Is also concerned about potential "presentational issues for the industry" if some lines companies end up being required to provide a greater proportion of their load than other lines companies or direct connects.
- 2.2.27 Lastly, Vector wants to ensure that any obligation on lines companies to arm selected feeders does not unduly interfere with their ability to undertake network maintenance or investments (presumably, including network re-configuration).

Summary of submitters' positions

- 2.2.28 Only two parties (Orion and Northpower) suggested that a different option to that proposed by the Authority would deliver superior outcomes. Both parties effectively suggested that options 1c or 1d would be better.
- 2.2.29 Norske Skog was concerned about whether the optimisation model would work.
- 2.2.30 Transpower didn't endorse the proposed approach but neither did it say the proposed approach couldn't work, or promote an alternative.
- 2.2.31 All remaining submitters were supportive of the proposed approach, although in many cases expressed reservations about specific aspects of

the detail of its implementation, with Vector in particular being concerned as to whether the approach would work in practice.

2.2.32 The following section sets out the Authority's response to the concerns and issues raised by submitters.

3. The Authority has considered the issues raised by submitters

3.1.1 The following list represents the key issues raised by submitters:

- (a) whether identification and procurement of the most appropriate load to provide AUFLS should be achieved through:
 - (i) central coordination; or
 - (ii) devolving the decision to obligated parties
- (b) how to coordinate AUFLS requirements with rolling outage requirements?
- (c) how to coordinate AUFLS with IL and other forms of demand response?
- (d) what should be the information and compliance requirements on parties?
- (e) the compensation and cost-allocation mechanism, particularly:
 - (i) is it necessary to have a mechanism at all?
 - (ii) whether a beneficiary-pays or exacerbator-pays approach is most appropriate for cost allocation?
 - (iii) how the compensation and cost allocation regime will interact with the Commerce Commission's price control regime?
- (f) what should be the timeframe for implementation of the revised arrangements?
 - (i) is there an option to implement aspects of the revised arrangements in stages?
 - (ii) what is a realistic timeframe to undertake the physical works to move to revised arrangements?
- (g) should any obligation treat large distribution-connected industrial loads the same way as direct connect (i.e. transmission-connected) industrial loads?
- (h) who should be responsible for determining the central estimates of VoLL for lines company load?
- (i) how will existing exemptions be revoked?
- (j) how will the industry address presentational issues associated with some parties providing a greater proportion of load as AUFLS than others?
- (k) how best to undertake the modelling for an optimisation approach?

- 3.1.2 Each of these issues is considered in the following sub-sections of this section of this paper.

3.2 Issue: Whether identification and procurement of the most appropriate load to provide AUFLS should be achieved through central coordination or devolving the decision to obligated parties

- 3.2.1 The most important aspect of the AUFLS procurement issue, and with which there was no disagreement (although some were silent on the matter), is that a one-size-fits-all approach to providing AUFLS will deliver undesirable outcomes, for the reasons set out in paragraphs 1.1.4+ of the consultation.
- 3.2.2 However, the key difference of opinion relates to which mechanism would be the most appropriate to identify and procure the most appropriate load to provide AUFLS.
- 3.2.3 At a high level, there have been two main approaches put forward as to how this could be achieved:
- (a) central coordination; or
 - (b) devolving the decision to obligated parties.
- 3.2.4 The procurement options involving central optimisation (i.e. options 2a to 2c in Table 1 above) or voluntary tender (options 3a and 3b) represent high levels of central coordination in terms of identifying which loads should be selected and armed.
- 3.2.5 The procurement options involving a common obligation (i.e. options 1a to 1d) represent approaches where the choice of loads is largely devolved to the obligated parties, although with increasing amounts of central coordination as the options progress from 1a through to 1d.
- 3.2.6 The Authority considers the relative merits of central coordination versus devolving the decision to obligated parties boil down to three main considerations:
- (a) how can inappropriate load be excluded from the provision of AUFLS, while still ensuring that sufficient AUFLS load is procured to deliver system security?
 - (b) how well does each approach deliver system security outcomes?

- (c) how well does each approach achieve AUFLS objectives in a manner which does not impose unnecessary constraints on parties' ability to manage their core business?

3.2.7 These issues are addressed in turn below (with the first two being addressed jointly).

Sub-issue: How to exclude inappropriate load, and achieve good security outcomes

3.2.8 The January 2014 consultation identified that it would not be practicable to implement a regime whereby parties voluntarily offered their load to provide AUFLS via a voluntary market mechanism – that is, options 3a and 3b in Table 1 above.⁷ This view was endorsed by all submitters.

3.2.9 This necessarily means that an *obligation* approach must be adopted to ensure that sufficient AUFLS are provided.

3.2.10 The January 2014 consultation further identified that a one-size-fits-all obligation approach (i.e. options 1a and 1b) would result in unnecessarily high cost outcomes in many instances. In large part such outcomes would occur because the same problems that would frustrate a voluntary market would also frustrate parties 'trading' away from their common obligations to achieve a more appropriate allocation of AUFLS.

3.2.11 This therefore means that if such unnecessary high cost outcomes are to be avoided, the AUFLS procurement approach needs to be able to deliver *varying* obligations on parties based on their relative suitability. The central optimisation approach does this inherently, whereas option 1c and 1d do this more simply through the use of mechanisms to apply blanket exclusions for classes of party deemed inappropriate, in general, to provide AUFLS. For example, specifying that all direct connects would be excluded.

3.2.12 This approach would likely result in lower implementation and operation costs than a central optimisation approach.

3.2.13 The updated cost-benefit analysis estimates that an approach which applied blanket exclusions to classes of party (i.e. option 1c) would cost approximately \$2.5m less to implement than the central optimisation

⁷ The consultation identified that this was principally due to the lines companies:

- having poor information on the relative values of their customers load,
- potentially having poor profit incentives under the Part 4 price control regime to participate in a voluntary mechanism; and
- not having the contractual ability under their use of systems agreements to voluntarily offer their customers load for the provision of AUFLS.

approach, and would enjoy materially lower on-going operating costs – approximately \$5.5m less in present value terms. In other words, in present value terms, the optimisation approach would cost approximately \$8m more to undertake than a 1c-type approach.

3.2.14 However, offsetting the lower costs would be reduced benefits. The cost-benefit analysis considers three main categories:

- (a) **Avoiding the loss of IR or DR.** The CBA considers there is no material difference between 1c and an optimisation approach (but there would be a \$15m NPV relative cost for a 1b-type approach which didn't apply the exclusions to classes of customer)
- (b) **Reductions in expected AUFLS load shedding costs.** The CBA analysis estimated that an optimisation approach would deliver approximately \$9m NPV benefits relative to the 1a-1d options
- (c) **Improved system security outcomes.** The modelling described in the CBA estimates that the better targeting of AUFLS load to meet the system requirement could deliver relative system security benefits of approximately \$29m compared with a 1c-type approach.

3.2.15 Overall, the CBA analysis of the scale of increased benefits relative to the increased costs are such that the optimisation approach delivers a \$30m NPV net benefit relative to a 1c option.

3.2.16 The CBA analysis identifies that a 1d-type approach (placing highly structured obligations on participants that varied by time of day and year and with max & min tolerances) would deliver better system security outcomes – although not as good as a full optimisation approach. However, such an approach would also result in greater implementation and on-going costs – particularly for participants. Thus, the relative net benefit of the optimisation approach compared to a 1d-type approach is \$16m. Further, the cost to individual participants is estimated to be *greater*, under a 1d-type approach, than for a central optimisation approach. This is because the central optimisation approach does the 'heavy lifting' of working out how best to meet a highly structured obligation rather than placing the burden on participants.

3.2.17 The estimated scale of benefit is considered to be sufficient to continue to progress with the preferred approach. However, it should be noted that the revised Code framework, whereby the procurement approach is specified in the selection methodology, rather than the Code, does allow for flexibility to adapt the preferred approach – including, potentially, to adopt (partly or wholly) the 1c-1d type approaches if further analysis deems that the relative cost-benefits of such approaches are in fact superior to a central optimisation approach.

3.2.18 It should be noted that, in addition to the quantified relative costs and benefits of the different options, there are other potential issues which were addressed qualitatively in the original consultation, but haven't been quantified in the CBA:

- (a) It is not clear that, under a 1c-type approach, generic exclusions of direct connects could work in the South Island given the size of the Tiwai smelter relative to the rest of the South Island. It would therefore be necessary to write increasingly prescriptive exclusions to address 'special cases'. In general, it is not considered good regulatory practice to try and address 'special cases' via drafting prescriptive clauses in the Code or related documents, as compared with a generic framework which can address participants' particular situations inherently. Most submitters agreed with this general principle
- (b) Even with a 'special cases' approach to drafting prescriptive exclusions, there would still be a residual risk of not anticipating every special situation, thereby resulting in a possibility of facing exemption requests again – which could be justified.

3.2.19 Another important point relates to the concerns expressed by some submitters as to the cost of implementing the proposed option, in particular the increased information and reporting requirements on them. In this respect it should be appreciated that all options will result in materially greater costs than the status quo. This is because under the status quo the system operator has very little visibility of how much actual AUFLS is being provided by parties, with consequential significantly increased system security risk. Accordingly, all options proposed in the January 2014 consultation will have significantly increased information reporting requirements to demonstrate compliance – albeit with the scale of costs being greater for a central optimisation approach and a 1d-type approach which places a highly structured obligation on participants.

Sub-issue: How well does each approach achieve AUFLS objectives in a way which does not impose unnecessary constraints on parties' ability to manage their core business?

3.2.20 A key aspect of the proposed central optimisation approach is that *obligations will apply to specific feeders*. As set out later on page 16, this is not necessarily an inherent feature of this approach, but it does have important implications which are addressed here.

- 3.2.21 This feature contrasts with an approach which devolves the process of identifying and arming feeders to participants in order to meet an obligation *specified on the participant*.
- 3.2.22 This feeder-specific obligation aspect of the proposed central optimisation approach is a key part of the overall process of achieving:
- (a) greater central coordination of which combination of feeders will deliver an 'optimal' security and economic outcome
 - (b) greater visibility of what load is armed for AUFLS at any moment in time, thereby enabling improved system operator management of the system to deliver good security outcomes.
- 3.2.23 However, making the obligation feeder-specific introduces the risk that the AUFLS arrangements may start to constrain the ability of participants to make changes to their feeders for the purposes of delivering on their core business outcomes.
- 3.2.24 For example, network companies occasionally need to reconfigure their networks to improve network management. This may be on a temporary basis (such as during maintenance) or on a permanent basis. However, a re-configured network may not be able to drop the same amounts of AUFLS load. For example, the introduction of loop automation at a zone substation may mean that some feeders which could previously be independently dropped in an AUFLS event can no longer be independently dropped, but instead can only be dropped as a group of feeders.
- 3.2.25 It is important to ensure that network companies are not constrained in their ability to make such improvements to their networks because they are tied by a feeder-specific AUFLS obligation. The costs of such outcomes could significantly outweigh any benefits associated with a feeder-specific selection process. The same holds true for similar potential constraints on direct connect consumers' ability to re-configure their sites.
- 3.2.26 The Authority has considered this and concluded that such outcomes should not occur provided that the AUFLS procurement approach is sufficiently flexible to allow parties to make changes to their AUFLS loads as required.
- 3.2.27 The arrangements to achieve this flexibility will be delivered via the selection methodology. Such arrangements have also been developed to address situations involving major changes in load, for example the closure of a major load on a feeder providing AUFLS.

3.2.28 The associated consultation on the proposed Code amendments which has been released at the same time as this responses document provides indicative examples of the selection methodology and technical requirements for the Authority's preferred procurement approach.⁸ The high-level description of what is proposed is as follows:

- (a) participants are required to notify the system operator of any changes to the configuration of their networks which will affect AUFLS loads. For temporary changes (such as due to maintenance outages), this will be subject to de-minimis thresholds in terms of MW affected and duration
- (b) if they can, participants are required to provide a reasonable set of alternative feeders to replace any AUFLS load that may have been lost. Parties must submit sufficient information on historical load and alternative uses (for example IL) for the alternative feeders for compliance purposes, and to ensure the system operator has on-going visibility of the likely AUFLS load at any moment in time
- (c) it has yet to be decided whether it would be necessary for this replacement of feeders to be subject to a system operator approval process. This will be determined as part of the finalisation of the selection methodology
- (d) the system operator will have the ability to call upon flexible AUFLS providers to adjust the overall level of AUFLS provision if the party can't provide reasonable alternative load, or the alternatives are only considered to be partial replacements
- (e) any changes will be recorded in a central register maintained by the system operator which will also be used to trigger any changes to payments as a result of such changes.

3.2.29 It should also be noted that network companies have the ability to anticipate this by identifying where feeders are likely to be re-configured in the future, and either:

- (a) excluding those feeders from the selection process, noting that they are only obliged to provide a minimum of [60%] of their load for consideration in the selection process; or
- (b) submitting a group of feeders as an AUFLS load-unit if it is likely that future network re-configuration will result in such feeders needing to be interrupted as a contiguous group for AUFLS purposes.

⁸ [insert web-ref once document is loaded on EA site]

- 3.2.30 Lastly, the proposed approach also allows for new IL or other demand response to be developed under an AUFLS feeder. As set out later in this document, such developments will be captured through information reporting requirements on parties to notify on an annual basis of what IL or other demand response is beneath AUFLS feeders. The system operator then has the ability to adjust the amount of AUFLS provided if required, through calling upon its flexible AUFLS providers.

The Code framework still enables a devolved approach to be adopted through subsequent consultation on the selection methodology

- 3.2.31 Paragraph 3.2.20 highlights that the current proposed approach results in obligations relating to specific feeders.
- 3.2.32 However, it is possible that a hybrid approach could be adopted whereby the central optimisation approach uses the same information to determine which combination of feeders are likely to provide the best AUFLS outcomes, but that the resulting obligation is expressed as an overall % requirement on parties (differentiated by AUFLS block, and time zone), rather than being specific to feeders.
- 3.2.33 In theory, this could give the obligated party more discretion to re-configure its network to provide AUFLS from a different set of feeders if it felt that it was appropriate, provided it still complied with its AUFLS obligation that had emerged from the selection process.
- 3.2.34 In practice, given that a key aspect of the new AUFLS arrangements is a need to deliver much greater visibility to the system operator of what load is armed for AUFLS – including taking into account alternative uses such as IL – it is likely that there would be very similar reporting requirements such that virtually the same information and processes to that set out in 3.2.28 above would be required.

3.3 Issue: Coordination of AUFLS requirements with rolling outage requirements

- 3.3.1 Some parties noted that insufficient detail had been provided in the consultation as to how the revised AUFLS requirements would interact with parties' obligations to have the capability to undertake rolling outages.
- 3.3.2 The Authority has considered this issue further in terms of the need to ensure that both mechanisms (that is, AUFLS and rolling outages) are consistent with each other and deliver appropriate outcomes.

- 3.3.3 Having reviewed a number of participants' rolling outage plans it is apparent that there is currently inconsistent practice with regards to how participants interpret the dual requirements of AUFLS and rolling outages:
- (a) some participants actively exclude all AUFLS feeders from being included as rolling outage feeders
 - (b) other participants aim to include a proportion of AUFLS feeders in their rolling outage feeders in order to maintain the same proportion of load armed for AUFLS during rolling outages.⁹
- 3.3.4 It is clear that this issue will need to be addressed, and that parties will need to re-visit their rolling outage plans irrespective of which AUFLS procurement option is implemented.
- 3.3.5 It is the Authority's provisional view that the practice set out in paragraph 3.3.3(b) above is likely to achieve the desired outcomes for both the AUFLS and rolling outage requirements.
- 3.3.6 The Authority's initial view on how to address this matter is that:
- (a) the AUFLS selection methodology is the appropriate place to specify what parties need to do with respect to making load available for possible selection for AUFLS
 - (b) the selection methodology should specify that, in deciding which loads a party should submit to meet the requirement to make a minimum of [60%] of their load available for possible AUFLS selection, a party should *not* factor whether a load is currently included within a rolling outage plan as part of that decision
 - (c) guidance should be issued to parties on how to develop appropriate rolling outage plans that are consistent with any AUFLS requirements that they may have following a selection process
 - (d) such guidance should be produced within the regulatory framework pertaining to rolling outages
- 3.3.7 If the Authority decides to pursue this approach, it does not consider that an amendment to Part 9 would be required. However, it will be considering this issue further, and it welcomes submitters' views.

⁹ For example, if 32% of a lines company's feeders were armed to provide AUFLS, and it was required to drop 10% of its load to meet a rolling outage requirement, the lines company would drop 10% of its AUFLS feeders and 10% of its non-AUFLS feeders. This would simultaneously satisfy the requirement to provide the overall 10% of load reduction, while maintaining the requirement to have 32% of its load armed for AUFLS.

3.4 Issue: Coordination of AUFLS with IL and other forms of demand response

- 3.4.1 One of the concerns raised by some submitters was that a central optimisation approach could result in outcomes which frustrate the future development of demand-side management approaches.
- 3.4.2 The Authority interprets such concerns as being that a party may be constrained in its ability to develop new IL or other demand-response products on feeders if it has been selected to provide AUFLS via the central process.
- 3.4.3 In addressing this issue, the Authority notes that concerns about the potential economic cost associated with load being prevented from being more valuably used for another purpose was a key driver behind choosing a central optimisation option. In this respect, the key mechanism to achieve desirable outcomes is as follows:
- (a) participants offering load into the selection process must provide historic data as to how much IL and other demand response uses load has been used for, plus indications if such historic values are likely to vary by more than 50% in the future
 - (b) the selection methodology will take account of such load in determining whether to select a feeder to provide AUFLS – that is, it will assume such load is not available during an AUFLS event
 - (c) selection of a feeder to provide AUFLS will not prevent load beneath it being used to provide IL or for other demand response purposes, including increasing or decreasing the amounts used for such purposes beyond historical levels
 - (d) changes to the amount of load beneath an AUFLS feeder being used for other purposes will be captured in the annual compliance reporting requirements on parties
 - (e) any such changes will be accommodated through the system operator adjusting the amount of AUFLS armed through use of the flexible AUFLS providers it has procured.
- 3.4.4 The Authority has yet to determine whether changes to the amount of IL or other forms of demand response on a feeder should flow through to changes in the amount of payments made to AUFLS providers.
- 3.4.5 Given that the issue of AUFLS' coherence with IL and other forms of demand response is to be addressed within the selection methodology, rather than the Code, the Authority will ensure that there is continued

consultation with industry on this issue as the selection methodology is developed further.

- 3.4.6 The Authority also notes that this issue of coherence between AUFLS and IL and other forms of demand response is an inherent issue which affects all options for AUFLS procurement. One example of this is the current lack of visibility which lines companies currently have with regards to load aggregators offering load within their network for IL or other purposes. The Authority understands that this has resulted in some feeders not dropping the amount of load during the recent AUFLS events that lines companies were expecting.
- 3.4.7 To address this issue of poor visibility the Authority is introducing a Code requirement that parties offering IL within a lines company's network must provide information about such load to that lines company. It is possible that changes to the requirements for offering IL into the IR market may also be considered to assist with this issue.¹⁰
- 3.4.8 Thus, irrespective of which AUFLS procurement approach is chosen, this need for greater visibility of how much load is available for AUFLS – including taking into account the extent load may be being used for other purposes – will give rise to greater monitoring and reporting requirements.
- 3.4.9 It is a matter for practical design as to the best means to gather such information. For example, it may be that information on IL could principally come via the IR market arrangements, although it is likely that such information may only be available at a GXP level, rather than an AUFLS feeder level.
- 3.4.10 More generally, the Authority notes that this issue of ensuring consistency between AUFLS and other forms of demand response will be a key aspect of its forthcoming joint initiative with the system operator addressing the issue of the different forms of demand response in a holistic manner.
- 3.4.11 In this respect, to the extent that this work results in future changes being introduced, the fact that this issue is addressed within the selection methodology rather than the Code, should provide more flexibility to make appropriate adjustments as required.
- 3.4.12 Lastly, developing the systems and processes to deliver greater visibility of what load is being used for at different times and locations should facilitate

¹⁰ For example, it may be appropriate to require IL to be offered in at the physical GXP beneath which it is located, rather than allowing all IL to be aggregated and offered at a single notional GXP for an island. (Noting that any such change would need to be considered in terms of potential adverse outcomes associated with compliance, and the need to continue to allow the diversity benefits of multiple loads being brought together by aggregators to continue if appropriate).

the electricity market as a whole moving towards real time co-optimisation of load among these different uses to deliver these higher value outcomes.

3.5 Issue: The information and compliance burden on parties

- 3.5.1 Some submitters were concerned about the information and compliance burden on parties from the proposed approach.
- 3.5.2 This issue has already been addressed in section 3.2 above, particularly paragraph 3.2.19, which illustrates that all options are going to have increased information and reporting requirements on participants. This is to deliver improved visibility to the system operator as to the level of AUFLS on the system – albeit with the scale of cost increase being greater for a central optimisation approach, and greater-still for a 1d-type obligation which places a highly structured obligation on participants.

3.6 Issue: The compensation and cost-allocation mechanism

Sub-Issue: Is it necessary to have a compensation mechanism?

- 3.6.1 Some submitters questioned whether the cost of developing a compensation mechanism would outweigh the benefits it could deliver. Orion additionally noted that most customers generally incur interruptions due to network outages (e.g. due to storms or cars hitting power poles) at significantly greater levels than those arising from AUFLS events. As such, they questioned whether the ‘interruption equity’ aspect of the compensation and cost allocation mechanism was really worth it.
- 3.6.2 In response to this, although the Authority considers that a compensation and cost allocation mechanism will deliver improved ‘fairness’ outcomes, it does not consider it to be the principal benefit. Indeed, delivering ‘fair’ outcomes is not one of its statutory objectives.
- 3.6.3 Rather, the Authority considers that the principal benefit of a compensation mechanism is through incentivising more economically efficient and reliable outcomes, in particular through:
 - (a) incentivising and enabling the provision of enhanced AUFLS services – e.g. AUFLS relays which can be remotely programmed and armed, or AUFLS relays and associated circuit breakers which operate faster (250ms rather than 400ms, say). These enhanced services will

deliver improved system security benefits through better targeting of AUFLS load, and potentially enabling future AUFLS scheme designs with a greater number of blocks than the current four block proposal. A well-designed compensation mechanism can provide an incentive on parties to progressively move towards having systems which can deliver such services. It also provides a ready-made vehicle which the system operator can use to procure voluntary AUFLS services which offer a high degree of sophistication – e.g. close-to-real-time arming / disarming to meet changing system requirements

- (b) the beneficiary-pays cost allocation mechanism incentivising direct connect participants to submit realistic VoLL estimates for the interruption costs of their load, and not submit unrealistically high interruption costs in order to not be selected.

- 3.6.4 The Authority considers that the scale of these economic efficiency / reliability benefits is greater than the cost of implementing and operating a compensation and cost-allocation mechanism.
- 3.6.5 However, the Authority is mindful that the design and operation of the compensation and cost-allocation mechanism is an area where the devil is in the detail, and it will seek to ensure that the design of this aspect of the selection methodology creates the incentives set out above, without being unnecessarily cumbersome to implement.
- 3.6.6 Such issues will be consulted on with industry during the process of finalising the selection methodology.

Sub-Issue: Beneficiary or exacerbator-pays approach for cost allocation

- 3.6.7 Most of the direct connects who made submissions suggested that an exacerbator-pays approach would deliver more appropriate outcomes. They suggested that an exacerbator-pays approach would deliver economic and reliability benefits through providing incentives on the 'causers' of the need for AUFLS (that is, Transpower and the owners of large generating assets) to alter their investment and operating decisions such that the incidence of AUFLS events would be reduced.
- 3.6.8 In contrast, Transpower and those generators and lines companies who submitted agreed that a beneficiary-pays approach was the most appropriate mechanism for AUFLS cost recovery.
- 3.6.9 The Authority has reviewed this issue and concluded that:

- (a) an exacerbator-pays approach would be unlikely to affect future HVDC investment upgrade decisions, and thus have no impact on the future quantity of AUFLS needed to be procured
- (b) it is not apparent that an exacerbator-pays approach would result in reduced incidence of AUFLS events given that, almost by definition, AUFLS events are unpredictable, and the generators and Transpower already face strong incentives to avoid their assets failing in such a way
- (c) Implementing an exacerbator pays approach would be contentious and costly in terms of:
 - (i) determining an appropriate cost allocation approach viz the proportion of costs to be borne by the owners of the various 'causer' assets (the HVDC, and generators)
 - (ii) implementing an audit regime to verify the interruption costs submitted by direct connects as part of the selection
- (d) an exacerbator-pays approach could have unintended economic costs in terms of creating perverse incentives on owners of supply assets to inefficiently withdraw capacity – as was the case in recent years in relation to Transpower withdrawing HVDC capacity in order to reduce its exposure to the IR event charge.

3.6.10 On balance, therefore, the Authority continues to believe that a beneficiary-pays approach will deliver the greatest net benefits.

Sub-Issue: How the compensation and cost allocation regime will interact with the Commerce Commission's price control regime

3.6.11 Some submitters raised the issue that the positive incentive aspects of compensation payments in terms of investing in AUFLS technologies that can deliver enhanced services¹¹ may be removed for some lines companies if the Part 4 price control regime administered by the Commerce Commission requires them to pass through any compensation payments direct to customers.

3.6.12 Some lines companies have also highlighted the fact that much of the equipment used to provide AUFLS is also used to provide other network services for the lines company – and that such network services are the core reason for the equipment. For example, lines companies are

¹¹ Examples of such enhanced AUFLS services include

- faster-acting response; or
- remote programming, arming, and monitoring capabilities

investing in network protection relays and associated control systems for network management purposes, but these modern relays also have the capability to undertake AUFLS services. Powerco said in discussions with the Authority that the proportion of assets providing AUFLS that are dedicated AUFLS assets (i.e. assets whose sole purpose is to provide AUFLS) is significantly less than 50% and progressively falling as the company invests in upgrade network protection assets. It also noted that the dedicated AUFLS assets tended to be the old electro-mechanical relays which have inferior functionality in that they typically needed to be manually programmed and armed.

- 3.6.13 Where assets provide core network services in addition to AUFLS services, it will become very difficult to construct compensation payments for such assets which are part regulated (and thus subject to the potential diluting incentive effects of pass-through as indicated in paragraph 3.6.11 above) and part unregulated.
- 3.6.14 The Commerce Commission has indicated in informal discussions with the Authority an in-principle willingness to implement price control arrangements which support the policy intent of mechanisms developed by the Authority, providing such arrangements are practicable and consistent with achievement of the Commission's own statutory objectives. (Noting also, that the Commerce Commission would need to consult on proposed price control arrangements.)
- 3.6.15 Given the issues outlined above, the Authority believes that the following approach could achieve the desired outcomes for all parties in a pragmatic manner:
- (a) costs incurred in the provision of network assets used to provide AUFLS would not have any special treatment under the Part 4 regime
 - (b) compensation payments will distinguish between:
 - (i) compensation for expected customer interruption costs
 - (ii) compensation for provision of assets to provide standard AUFLS services. These will be based on the costs of providing such assets
 - (iii) payments for provision of assets to provide enhanced AUFLS services. These payments will be based in part on the extra system security value that such services provide
 - (c) payments could then be treated differently under the Part 4 regime, with some being 'regulated' and some being 'unregulated'

- (i) compensation payments for expected interruption costs and standard AUFLS services could be treated as regulated revenue under the price control regime. This would appear appropriate for interruption cost compensation as it is the customers incurring such costs, not the lines company's shareholders. Similarly, it would be appropriate for provision of assets to provide standard AUFLS services as it will be in relation to costs which will have already been recovered through the 'standard' approach to cost recovery under the Part 4 regime consistent with paragraph 3.6.15(a) above
- (ii) payments for enhanced AUFLS services would be excluded from determination of price caps – i.e. it would be effectively 'unregulated'.

3.6.16 This treatment of payments for enhanced AUFLS services should preserve any incentive on regulated parties to provide such enhanced services.

3.6.17 However, the Authority notes that:

- (a) such proposed compensation arrangements would need to be consulted on further with industry as part of development of the selection methodology
- (b) the treatment of payments for enhanced AUFLS under the Part 4 price control regime is entirely for the Commerce Commission to determine. In this respect, irrespective of any informal discussions between the Authority and Commerce Commission, the Commerce Commission can only formally consider the treatment of AUFLS compensation payments once they are finalised, and any proposed treatment by the Commerce Commission of such payments would need to go through its own consultation processes before being finalised.

3.6.18 That said, the Authority is hopeful that an approach similar to that outlined above can be developed. As such, it believes that introducing Code which can enable such compensation and cost-allocation approaches is likely to be of benefit.

3.7 Issue: What should be the timeframe for implementation of the revised arrangements?

Sub-issue: Is there an option to implement aspects of the revised arrangements in stages?

- 3.7.1 Transpower suggested the Authority consider moving ahead with the technical requirements, and implement changes to the procurement approach as a stage two. This was similar to a suggestion put forward by Orion.
- 3.7.2 The Authority has already considered the likely timing of the different options in developing its CBA, with the relative NPV values of the options already reflecting differences in timing of implementation.
- 3.7.3 That said, the Authority is mindful that the relative timing of implementation is an important consideration in determining the relative merits of the options.
- 3.7.4 It also notes that the proposed Code amendment delivers considerable flexibility to the selection methodology such that, in principle, it would be possible to implement an initial selection approach for the first implementation which is similar to the 1b to 1d-type options considered. To the extent that such a hybrid approach delivered material timing benefits it could be possible that it would be preferable to other options.
- 3.7.5 However, any such decisions would need to be based on a rigorous cost-benefit analysis. In this respect, the Authority will continue to work with the system operator and participants as the detail of the selection methodology is finalised, and use a principled approach – particularly with the use of a CBA – to make its decisions.

Sub-issue: What is a realistic timeframe to undertake the physical works to move to revised arrangements?

- 3.7.6 Some lines companies, in particular Powerco, raised concerns about the timetable. In particular, they considered that it may not be physically achievable to make the changes (including testing) to all the hundreds of AUFLS relays given the scarce technician resource available.
- 3.7.7 The Authority agrees that the implementation timetable will need to be revised in light of the information provided by submitters.
- 3.7.8 However, the Authority notes that this is an inherent issue faced by all procurement options given that the move to the new four-block technical

scheme proposed by the system operator will require all AUFLS relays to have their settings changed at least.

- 3.7.9 As noted in the previous issue, the extent to which timing affects the relative merits of options has already been considered in the CBA.¹² This will be updated to take account of the implementation timing issue identified here.

3.8 Issue: Should any obligation treat large distribution-connected industrial loads the same way as direct connect (i.e. transmission-connected) industrial loads?

- 3.8.1 MEUG suggested that it would be appropriate for large industrial customers connected to dedicated feeders on a lines company's network to be able to be excluded from the lines company's obligation, and treated the same as an industrial customer that is directly connected to the transmission network.
- 3.8.2 In considering this issue, the Authority notes that the Code can only create obligations on parties that are participants. All transmission-connected loads will automatically be participants, but it is not necessarily the case that distribution-connected loads will be.
- 3.8.3 Further, the Authority considers that the design of the proposed arrangements are such that there should be no difference in outcomes with regards to whether a feeder supplying a large distribution-connected load is selected to provide AUFLS or not.
- 3.8.4 This flows from the requirement on lines companies to provide specific information on the interruption costs and alternative uses for load (such as IL) for feeders that are dedicated to individual customers with annual loads greater than 25GWh.
- 3.8.5 Lastly, the Authority notes that a large load is free to negotiate specific arrangements with its lines company in relation to AUFLS, and that the lines company can then reflect these in the information it provides to any selection process (or indeed whether it includes such a feeder in the 60% of loads it is required to put forward to the selection process).

¹² For example, it is potentially the case that an optimisation approach could result in a faster physical implementation in that the optimisation approach will explicitly consider the costs of moving away from existing feeders in the evaluation. Offsetting this gain would be a longer time to get to the point where the individual obligations are set.

3.9 Issue: Who should be responsible for determining the central estimates of VoLL for lines company load?

- 3.9.1 A number of parties raised questions about the specifics of how interruption costs for lines company customers should be estimated.
- 3.9.2 The January 2014 consultation suggested that a centrally-determined framework be used to estimate the interruption costs of most lines company load – with an ability for specific values to be used for feeders dedicated to large industrial customers.
- 3.9.3 This approach requires that lines companies estimate the proportions of different generic classes of customers on each feeder, with the central framework developed by the Authority providing the VoLL values for such generic classes.
- 3.9.4 It is recognised that assessment of generic interruption costs is difficult and contentious. However the main requirement is for a consistent approach to establish relative values, and a complex high cost approach to estimation can't be justified given the inherent uncertainties.
- 3.9.5 Further, the current approach is just one of several viable alternatives including:
- (a) using more or less or different customer classes
 - (b) using regionally varying generic interruption costs
 - (c) varying the “large user” threshold from 25GWh per annum, up or down, or limit the right to provide their own estimates unless that they arrange to be allocated their share of the load interruption payments and cost allocation with their local network
 - (d) using the rankings currently used for participant rolling outage plans (PROPs) to more simply derive a relative interruption cost measure.
- 3.9.6 These viable alternatives all have different pros and cons, and will need to be considered further when the selection methodology is consulted on.

3.10 Issue: How will existing exemptions be revoked?

- 3.10.1 Existing exemptions will expire on the earlier of September 2015, or when a replacement AUFLS regime is in place.
- 3.10.2 The Authority anticipates that the revised process will result in the selection process being run, and statements of extended reserve obligation being issued, by May 2015.

- 3.10.3 At that point, obligations under the old AUFLS regime would be replaced either by new obligations, or by no obligations (if a party was not selected to provide AUFLS), and the current exemptions would no longer be required.

3.11 Issue: How will the industry address presentational issues associated with some parties providing a greater proportion of load as AUFLS than others?

- 3.11.1 Some submitters were concerned about the 'presentational issues' for the industry associated with outcomes where some parties were required to arm a greater proportion of their load for AUFLS than others.
- 3.11.2 In considering this issue, the Authority notes that it is bound by its statutory objective. Therefore, if an outcome whereby some parties provide a greater proportion of their load for AUFLS than others is demonstrably in the long-term interests of New Zealand's consumers overall, such an outcome would be influential.
- 3.11.3 Further, the Authority notes that the compensation mechanism should significantly address perceptions of the 'fairness' of such outcomes, noting that issues of fairness are not a driver in the Authority's considerations.
- 3.11.4 Also, as noted by other submitters, it should be appreciated that the levels of interruption due to AUFLS for most customers attached to AUFLS feeders is likely to be significantly less than the levels of network interruption experienced by customers due to factors such as storms or cars hitting power poles.

3.12 Issue: How best to undertake the modelling for an optimisation approach?

- 3.12.1 Norske Skog raised concerns about the 'impossibility' of estimating customers' VoLL interruption costs, and questioned the technical modelling approach – particularly that it was a deterministic model, whereas a stochastic model is required.
- 3.12.2 With regards to the VoLL issue, while it is inherently to estimate the *absolute* \$/MWh VoLL costs accurately it is entirely feasible to undertake an exercise which will reasonably estimate the *relative* interruption costs between different classes of customers. This should enable significant reductions in interruption costs – even if the magnitude of such an improvement is hard to estimate accurately.

- 3.12.3 With regards to the modelling approach, the proposed approach is not considered to be deterministic. Indeed, at its core it explicitly addresses the randomness and variation of load that appears to be behind Norske's comments. Indeed, it is considered to be one of the key strengths of the approach that it explicitly addresses such randomness and variation, and can identify an optimal combination of feeders which will better deliver the required quantity of load for AUFLS at different times of the day and year.

Appendix A Overview of submitter responses to consultation questions

Q1 Please provide reasons if you agree that lines companies' UoSAs do not grant them the rights to place their customers' load under AUFLS as part of a voluntary commercial agreement. Please also provide reasons if you disagree.

All submitters who answered this question agreed that lines companies' UoSAs do not grant them rights to place their customers' load under AUFLS as part of a voluntary commercial agreement.

Q2 Please provide reasons if you agree that it is not practical to change the UoSAs within the timeframe required to implement the new AUFLS arrangements. Please also provide reasons if you disagree.

All submitters who answered this question agreed that it is not practicable to change the UoSAs within the timeframe required to implement the new AUFLS arrangements. This is because the process of changing UoSAs is complex, and requires negotiations and agreement.

Q3 Please provide reasons if you agree that lines companies will likely face weak commercial incentives to enter into bilateral commercial arrangements to vary their level of AUFLS provision. Please also provide reasons if you disagree.

Most submitters agreed that lines companies will likely face weak commercial incentives to enter into bilateral commercial arrangements to vary their level of AUFLS provision. However, Powerco stated that it was unable to comment meaningfully on the strength of incentives because of uncertainty as to the Commerce Commission treatment of commercial equivalence arrangements.

Q4 Please provide reasons if you agree that excluding direct connects from the obligation to provide AUFLS would be inappropriate. Please also provide reasons if you disagree.

Most submitters agreed that excluding direct connects from the obligation to provide AUFLS would be inappropriate. However, Norske Skog considers that direct connects need an exemption.

Q5 Please provide reasons if you agree that a beneficiary-pays approach to recovering the cost of any compensation payments is likely to deliver more efficient outcomes than a causer-pays approach. Please also provide reasons if you disagree.

There was no consensus from submitters on this issue. The direct connect consumers argued for a causer-pays approach on the grounds that it would incentivise Transpower and the generators to operate their plant with greater care such as to reduce the incidence of AUFLS events, whereas all other parties agreed that a beneficiary-pays approach was the most appropriate.

Q6 Do you have any comments about the preferred approach to determining the VoLL of lines company feeders?

Most submitters who answered this question agreed with the preferred approach for determining VoLL of lines company feeders – i.e. using a centrally-determined framework. However, Orion suggested that lines companies were better placed to establish the most appropriate feeders to place under AUFLS, and Norske Skog suggested that determining lines company feeders is an impossible task.

Q7 Please provide reasons if you agree that issues with lines companies' incentives and contractual ability are likely to severely reduce the potential effectiveness of a voluntary AUFLS tender. Please also provide reasons if you disagree.

The submitters generally agreed that issues with lines companies' incentives and contractual ability are likely to severely reduce the potential effectiveness of a voluntary AUFLS tender. However, Transpower considers that the issues relate more to the ability to provide certainty of AUFLS availability.

Q8 Do you have any comments on relative ranking of the options?

Most submitters agreed with the relative ranking of the options. However, Norske Skog noted that the scoring system was based on optimisation being infallible. Therefore, if that assumption is incorrect, the scores will be incorrect. Orion also outlined a number of concerns. Transpower requested that the cost-benefit also identify the likely costs and benefits of a staged approach, whereby the revised technical requirement were undertaken as a stage one, with a revised procurement approach implemented as a later stage two.

Q9 Do you have any comments on the proposed timetable?

Most submitters who commented on this issue had general concerns about the timetable. Many considered that the timetable may not be achievable due to the time it would take to make the changes (including testing) to all the hundreds of AUFLS relays, given the scarce technician resource available.

Q10 Do you need any more information to help you plan your resource availability to meet the requirements set out in paragraph 4.1.9

Powerco and Transpower specified that the process was too incomplete and unclear to plan resource availability.

Q11 Do you have any issues with the potential use of timers for arming AUFLS load?

None of the submitters identified any issues with the potential use of timers for arming AUFLS load, and Orion indicated it was already using a timer for an AUFLS relay.

Q12 Do you have comments on the indicative implementation costs used in the CBA?

The submitters that commented on this question considered that the implementation costs are likely to be higher than that indicated in the CBA. However, Meridian thought that there is no need to discard the preferred option due to higher costs.

Q13 Do you have comments on the indicative on-going costs assumed in the CBA?

The submitters that commented on this question considered that the ongoing costs are likely to be significantly higher than that indicated in the CBA.

Q14 Do you have comments on the indicative base level and future benefits assumed in the CBA?

Only a few of the submitters commented on this question. Powerco agreed that the proposal will have significant reliability benefits.

Q15 Do you have any other comments on the CBA?

While some submitters thought the CBA was well done, other submitters considered that the most simple and cost effective method had not been determined.

Q16 Do you have comments on the proposed compensation payment mechanism?

Most submitters agreed with the proposed compensation payment mechanism. However, Orion considered that the proposed payment mechanism is not required to achieve good AUFLS outcomes, and Vector considered that the current proposal does not provide the right incentive for distributors.

Q17 Please provide reasons if you agree that, in an arrangement where different stakeholders are required to provide different proportions of their load as AUFLS based on their relative suitability, it is appropriate to compensate stakeholders for the costs they incur in providing AUFLS. Please also provide reasons if you disagree.

Most submitters agreed that it is appropriate to compensate stakeholders for the costs they incur in providing AUFLS. However, Orion went on to say that it did not believe that the AUFLS costs would vary significantly between parties, thereby reducing the need to have compensation.

Q18 Based on your experiences of the existing AUFLS and PROPs arrangements, do you have any views on the appropriate approach to ensure consistency of the two arrangements?

Most submitters considered that a pragmatic approach that is consistent with the way the system operator implements PROPs should ensure consistency between the two arrangements. However, Vector recommends further consultation on this point.

Q19 Do you have any comments / suggestions about the historical load information requirements on stakeholders?

While NZ Steel considered that it could easily provide historical load information, other submitters were concerned about the potential cost of collating and providing the information.

Q20 Are there any other technical reasons (other than load shape, or the VoLL of customers connected to it) why a feeder may not be suitable for AUFLS?

Some submitters provided details of feeders that may not be suitable for AUFLS.

Q21 Do you have any other comments?

Most submitters agreed in principle with the preferred approach. However, some submitters were concerned about the lack of detail in the consultation paper, and how the approach would work in practice.

Appendix B Summary of submissions

Submitter	Comment	Authority Comment
Question 1: Please provide reasons if you agree that lines companies' UoSAs do not grant them the rights to place their customers' load under AUFLS as part of a voluntary commercial agreement. Please also provide reasons if you disagree.		
Contact	No comment.	The Authority notes the general agreement from submitters on this issue.
MEUG	MEUG agrees that line companies UoSAs do not grant them the rights to place their customers' load under AUFLS as part of a voluntary commercial agreement. Even if lines companies had such rights the question is whether lines companies or end customers directly, or retailers and aggregators as agents for end customers would not be a better approach.	
Meridian	Meridian agrees that the model UoSA does not grant the right to place customers' load under AUFLS as part of a voluntary commercial agreement. It grants the right to place customers' load under AUFLS in accordance with the Code.	
New Zealand Steel	No comment.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Orion acknowledges that while it cannot speak for all UoSAs, it considers that the MUoSA prevents this because such rights only accrue where rights to offer the customer load is "acquired" from the customer via a specific (by implication discounted) pricing option. Under the MUoSA, and most other agreements Orion is aware	

Submitter	Comment	Authority Comment
	of, customers load can be interrupted for system security reasons and/or under instruction from the system operator.	
Pacific Aluminium	No comment.	
Powerco	Powerco agrees with the advice regarding lines companies' abilities under MUoSA-based agreements to place customers' load under AUFLS as part of voluntary commercial agreements. This is because the Load Management Schedule applies if: - a customer elects to receive controlled supply does not include load controlled in accordance with AUFLS; and - the service interruptions clause permits load shedding in accordance with AUFLS, but only if this is 'implemented in accordance with the Code'.	
Transpower	No comment.	
Vector	No comment.	
Question 2: Please provide reasons if you agree that it is not practical to change the UoSAs within the timeframe required to implement the new AUFLS arrangements. Please also provide reasons if you disagree.		
Contact	No comment.	The Authority notes the general agreement from submitters on this issue.
MEUG	MEUG acknowledges that there is a time constraint. However, the primary question relates to the best counterparty in the long term development of managing extended reserves.	
Meridian	Meridian agrees that it is not practical to change the UoSAs within the timeframe required to implement the new AUFLS arrangements. The only way to achieve a change in a short timeframe would be to change the model UoSA and mandate its use. Even this approach may not be fast enough to allow full implementation by the end of 2016.	
New Zealand Steel	No comment.	
Norske Skog Tasman	No comment.	

Submitter	Comment	Authority Comment
Northpower	No comment.	
Orion New Zealand Ltd	Such agreements can only be changed by agreement, and because all customers on a network would be affected, all retailers would have to agree. Even assuming engagement, which is a big assumption as there is not obviously anything in this for retailers, this could take a significant amount of time.	
Pacific Aluminium	No comment.	
Powerco	Powerco agrees that it is not practical to expect all UoSAs to be changed within the proposed timeframe because negotiating and signing of UoSAs with retailers is a complex process that can take many years to complete (Powerco has 14 UoSAs with 7 retailers; some have only been signed in the last 12 months after two years of negotiation). Revisiting those arrangements is not practical, cost effective or necessary. Conducting work to consider the practicalities of mandating the MUoSA may provide an opportunity to future proof the MuoSA in respect of extended reserve requirements by reviewing and amending the wording of key clauses.	
Transpower	No comment.	
Vector	No comment.	
Question 3: Please provide reasons if you agree that lines companies will likely face weak commercial incentives to enter into bilateral commercial arrangements to vary their level of AUFLS provision. Please also provide reasons if you disagree.		
Contact	No comment.	The Authority notes the broad agreement from submitters on this issue.
MEUG	See MEUG's responses to questions 1 and 2.	
Meridian	Meridian agrees that the incentives to enter into bilateral arrangements may be weak due to the part 4 price control regime of the Commerce Act.	
New Zealand Steel	No comment.	

Submitter	Comment	Authority Comment
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Orion agrees that the commercial incentives are weak. However, it states that this is true of many decisions that distributors make in the interests of customers.	
Pacific Aluminium	No comment.	
Powerco	Powerco is unable to comment meaningfully on the strength of the incentives for lines companies to participate in such arrangements because of: - the uncertainty attached to how the Commerce Commission would treat the revenues associated with any commercial equivalence arrangements; and - its view that the common AUFLS percentage obligations option is not the best option or worth pursuing further.	
Transpower	No comment.	
Vector	No comment.	
Question 4: Please provide reasons if you agree that excluding direct connects from the obligation to provide AUFLS would be inappropriate. Please also provide reasons if you disagree.		
Contact	No comment.	The Authority notes the submissions made by submitters on this issue.
MEUG	MEUG agrees that excluding direct connects from the obligation to provide AUFLS would be inappropriate. A flexible and generic regulation is preferred.	
Meridian	Meridian agrees that excluding direct connects from the obligation to provide AUFLS would be inappropriate. Some direct connects are able to provide AUFLS at reasonable cost. There is no reason to exclude direct connects as a group.	
New Zealand Steel	NZ Steel agrees that excluding direct connects from the obligation to provide AUFLS seems inappropriate, given that the	

Submitter	Comment	Authority Comment
	common AUFLS percentage obligation approach is going to be dropped in favour of the preferred option mentioned in the consultation paper. However, there are still some aspects of the preferred option that NZ Steel wishes to discuss with the Authority because of its unique situation.	
Norske Skog Tasman	Norske Skog does not agree that excluding direct connects from the obligation to provide AUFLS would be inappropriate. If direct connects did not hold exemptions, Norske Skog suggests that the Authority would <i>"still be writing reports explaining why the grid had blacked out twice in the last few years, and why reserve and energy costs were 'inefficiently high'"</i>. However, direct connects may be treated as "special cases".	
Northpower	No comment.	
Orion New Zealand Ltd	Orion agrees that it would be inappropriate to exclude direct connects from the AUFLS obligation. Although there may be special reasons (similar to the choices distributors make about what feeders are exempt (not armed) from AUFLS, the initial obligation should remain.	
Pacific Aluminium	No comment.	
Powerco	Powerco agrees that creating situations where "special case" Code amendments are made is not logical or necessary. A solution should be sought that is capable of handling all circumstances and designed to have the flexibility to meet the current and future requirements without exemptions.	
Transpower	Transpower agrees that excluding direct connects from the obligation to provide AUFLS would be inappropriate.	

Submitter	Comment	Authority Comment
Vector	No comment.	
Question 5: Please provide reasons if you agree that a beneficiary-pays approach to recovering the cost of any compensation payments is likely to deliver more efficient outcomes than a causer-pays approach. Please also provide reasons if you disagree.		
Contact	No comment.	
MEUG	MEUG disagrees that a beneficiary-pays approach to recovering the cost of any compensation payments is likely to deliver more efficient outcomes than a causer-pays approach. This is because: - when determining final design and cost estimates, Transpower has weaker incentives to assess AUFLS risks and mitigation strategies under a beneficiaries-pay approach. The improved alignment of an incentive on Transpower to make sure that it considers AUFLS risks and that Transpower, not the Commerce Commission or end customers, has the technical expertise to undertake that risk assessment and consider mitigation options are both benefits of using exacerbators-pay. A capital expenditure proposal submitted to the Commerce Commission to consider under the GIT will be of better quality in terms of pricing the risk of AUFLS specific to that project; - it reasonable to assume that owners of plant that may cause AUFLS events will at least take a moment to reassess their operating practices. Those asset owners are best placed to decide how much time they will need to reassess their operating practices against possible AUFLS risks. The incremental resources and any change in operating may be negligible; but any change under an exacerbators-pay approach is a better outcome than beneficiaries-pay; - the challenges in deciding allocation to potential causers is not a reason to have a beneficiary-pay approach. Simplifications and a degree of averaging are required when allocating IR. Similarly, simplifying some of the assumptions	Having considered the issues raised by MEUG and other direct connects, the Authority does not believe the analysis set out in the January 2014 consultation is incorrect. Specific issues raised by submitters are as follows: The Authority does not believe that having Transpower face the cost of AUFLS will result in changes to future HVDC investment decisions: - Given that such AUFLS costs will almost certainly be treated as a regulated revenue, it is not apparent that Transpower's incentives regarding proposing any future upgrade will be affected in any material fashion - The Commerce Commission has a statutory requirement to consider all the relevant costs and benefits of a transmission upgrade. It is not apparent that the Commission is lacking in capability to consider AUFLS aspects given that it has the capability to consider the many other complex aspects of a major transmission upgrade. Based on the above, and given that the HVDC is the only likely future investment decision that would have an influence on the amount of AUFLS needed to be procured, there would appear to be no potential saving in the amount of AUFLS needed to

Submitter	Comment	Authority Comment
	will be needed to allocate AUFLS procurement costs to likely primary causers. The allocation formula may need to consider potential generator second effect or sympathetic trips to address the concern mentioned in the paper. For example the allocator may assign some AUFLS procurement costs to all generators; • it is not certain that Transpower will be able to pass any extended reserves exacerbator-pay charges onto its customers. The Commission may decide that having Transpower exposed to these costs may improve incentives for better outcomes for the long term benefit of consumers. For example, if Transpower has a stake in reducing AUFLS procurement costs then it will be able to use its considerable technical expertise and resources to facilitate innovation in the supply of AUFLS; • there will be change in the quantity of AUFLS by changing to a beneficiaries-pay approach. In the long run causers will make some changes to avoid the risk of events occurring. This means that in future resets of the AUFLS technical standards there is likely to be a downward decrease in AUFLS quantities and or better specification of the block sizes and characteristics; • a beneficiaries-pay approach will not incentivise stakeholders to submit realistic VoLL. Under the preferred option lines businesses do not set VoLL. The System Operator uses VoLL estimated by the Authority based on information on each feeder from the lines businesses. That information should be consistent with information already provided in PROPS. If there is a discrepancy the System Operator should investigate. MEUG cannot see what incentive a lines company would have not to provide accurate information. For the 5 direct connects in the North Island at first glance it is	be <i>procured</i> from moving to a causer pays approach. In terms of reducing the <i>incidence</i> of events which cause AUFLS, that could only be achieved through a causer-pays approach which was based on an event charge. In this respect, the Authority considers that any change in the failure rate of assets which cause AUFLS is likely to be negligible. This is because the very nature of AUFLS is to be the last resort to capture the failure of multiple assets due to unanticipated events. Just using the two most recent AUFLS incidents as an example, it is not clear that being subject to a potential AUFLS event charge would have made Transpower or Genesis any more careful than they already are regarding the potential failure of their assets. It appears that MEUG acknowledges this likely scale of changed outcome through stating “the incremental resources and any change in operating may be negligible”. Offsetting this likely negligible benefit, the Authority considers there are tangible costs with an event-charge-based causer-pays approach: - Potential unintended consequences from parties inefficiently withdrawing their assets from the market due to concerns about incurring an event charge. This has occurred in the past in relation Transpower withdrawing HVDC capacity in response to the IR event charge - the efficiency benefit of incentivising direct consumers to submit realistic VoLLs would

Submitter	Comment	Authority Comment
	arguable they will have weaker incentives to provide true VoLL under an exacerbators-pay approach than beneficiaries-pay. This raises a number of policy design questions. However, the 5 direct connects are also subject to PROPS. This means that the System Operator has some visibility of their relative VoLL. It is also important to note that for the optimisation analysis it's a reasonable estimate of forecast VoLL that's required not an estimate accurate to the nth degree. If the choice of the marginal feeder became contingent on estimated VoLL for a particular direct connect, then at that stage further discussion and analysis between the System Operator and grid connected party would be warranted. This should be achievable on a pragmatic and reasonable basis. Most of the direct connect load will be unsuitable for AUFLS for a number of technical reasons and or load might have higher value IR and other markets. Direct connects are also conscious that they need to play their part where they can. There will be some load, such as office or non-essential warehouse load, which could be offered to be armed as AUFLS and MEUG thinks that the direct connect customers' will want to make that work. This has been the experience in implementing PROPS. Even if the Authority believes there is a material residual incentive for the 5 North Island direct connects not to offer their true VoLL, MEUG thinks that there are better ways to manage that risk. For example, the System Operator could ask the Authority to commence an enquiry into a particular direct connect and use the Authority's powers to access information to validate VoLL estimates. Finally, a benefit of an exacerbators-pay approach is that a more market like regime and clearer path for evolving more market mechanisms will be established. The consultation paper did not consider this benefit of an exacerbators-pay approach.	be lost, or extra costs would be incurred in terms of auditing such VoLL estimates. - There would likely be costs associated with legal challenges to determine the causer in many events – particularly for those events involving multiple assets or where natural disaster or third party actions were involved. On balance, the Authority considers the potential economic efficiency benefits of a causer-pays approach are likely to be very small, but would likely be offset by more tangible costs and possible unintended consequences.
Meridian	Meridian considers that there is little difference between a beneficiary pays or causer-pays approach to recovering the	

Submitter	Comment	Authority Comment
	costs of compensation payments. However, a beneficiary pays approach provides incentives for realistic assessment of VoLL by stakeholders.	
New Zealand Steel	NZ Steel disagrees. It supports the MEUG's response to this question that the causer-pays approach is superior to the beneficiary-pays approach.	
Norske Skog Tasman	Norske Skog disagrees. It believes that causers of AUFLS should pay. This is because <i>"charging beneficiaries is a little like paying the mafia to safeguard your car."</i>	
Northpower	No comment.	
Orion New Zealand Ltd	Orion agrees that a beneficiaries-pays is more appropriate in this case. However, Orion considers that the concept of compensation is an unnecessary complication at this stage of reserves, AUFLS, DSM and IL development.	
Pacific Aluminium	Pacific Aluminium disagrees. It considers that the Authority's rationale for preferring a beneficiary-pays approach ahead of a causer-pays approach to recover the cost of providing AUFLS services is not convincing. There can be no dynamic efficiency gains with the beneficiary-pays approach as the beneficiaries have little or no ability to influence outcomes. However, if suppliers are allocated the cost of providing AUFLS, there will be some incentive to make trade-offs to reduce this cost. Therefore, there will be a positive impact on dynamic efficiency that is absent in the proposed beneficiary-pays approach. Pacific Aluminium prefers a causer-pays approach to allocating the cost of providing AUFLS because: • causer-pays is higher ranked than beneficiary-pays and the causers are readily identifiable;	

Submitter	Comment	Authority Comment
	- dynamic efficiency benefits are higher with causer-pays and even though they may not be large, they will be absent under beneficiary-pays; - the Authority's stated concerns with causer-pays can be overcome or are not relevant (recognised wealth transfers); and - allocating the cost of extended reserves (AUFLS) on a beneficiary-pays basis is inconsistent with the way the cost of the reserves market are allocated (causer-pays), and there is no compelling reason not to allocate on a causer-pays basis. It is unclear how allocating the cost of providing AUFLS services to beneficiaries (consumers) better meets the Authority's statutory objective than allocating the cost to causers, who can be readily identified.	
Powerco	Powerco agrees that a beneficiary-pays approach to recovering the cost of any compensation payments is likely to deliver more efficient outcomes than a causer-pays approach because: - the incentives that drive a successful causer-pays approach are significantly weakened when considered in the context of the AUFLS cost allocation; - a causer –pays approach would be ineffective as other regulatory requirements currently provide potential causers with stronger incentives to avoid potential major supply interruptions; and - a beneficiary pays approach will direct incentives to other parties that would encourage a more economically beneficial outcome.	
Transpower	Transpower supports a cost-recovery approach that has the objective of creating the right incentives on AUFLS providers with	

Submitter	Comment	Authority Comment
	respect to AUFLS pricing.	
Vector	No comment.	
Question 6: Do you have any comments about the preferred approach to determining the VoLL of lines company feeders?		
Contact	No comment.	
MEUG	MEUG agrees with the preferred approach to determining the VoLL of lines company feeders. However, MEUG considers that an end use consumer on a dedicated feeder should have the option of having a direct relationship with the System Operator and reporting their own VoLL and if selected to be armed for AUFLS, receive payments directly. This change: • will ensure that end customers, with the ability to arm for AUFLS, will have an incentive to make their suitability known to the System Operator; • will lower the costs to discover lowest cost supply of relays to arm for AUFLS; • will help manage confidential information. End customers may not necessarily wish to discuss with lines companies their VoLL and use of and plans for demand response in the energy market, IR market, participation in Dispatchable Demand from May 2014 and potentially in the future participation in the FK market; and • is consistent with progressively changing to more market type approaches such as voluntary tenders; • will best achieve the market related benefits.	The Authority notes that the proposed process will require that specific VoLL values for feeders dedicated to large industrial loads. This should deliver the same outcomes in terms of whether the feeder is selected for AUFLS or not, as desired by the process suggested by MEUG.
Meridian	Meridian supports the approach of central determination of lines company VoLLs with a process that allows for 'special case' load on particular feeders to be identified. This view is based on: • achieving consistency of approach and lower costs; and	Noted

Submitter	Comment	Authority Comment
	the fact that lines company representatives have stated that they have concerns about accurately determining VoLL for their networks.	
NZ Steel	NZ Steel considers that the central determination of the VoLL of lines companies seems appropriate.	
Norske Skog Tasman	Norske Skog believes that determining the VoLL of lines company feeders is an impossible task.	The Authority notes that VoLL estimation is inherently difficult, and impossible to get 'right'. However, it considers that it is feasible to undertake an exercise which will reasonably estimate the <i>relative</i> interruption costs between different classes of customers. This should enable significant reductions in interruption costs – even if the magnitude of such an improvement is hard to estimate accurately.
Northpower	No comment.	
Orion New Zealand Ltd	Orion considers that: - determining VoLL is a combination of science and art; - distributors are best placed to assess which feeders are armed on AUFLS; - there is significant risk that a central mechanism for determining VoLL will lead to poor outcomes; - distributors will almost certainly disagree and challenge any central mechanism results; - the transition of AUFLS over time to the zone substation feeder level will enable distributors to grab the 'easy low VoLL fruit' and negate the need for anything more complicated; and - most networks will be able to achieve 32% low VoLL feeders relatively easily – particularly if the compliance regime is	The Authority notes that: - the key consideration for AUFLS is establishing the right groups of customers to place under AUFLS <i>across</i> each island. - there are considerable variations in the proportions of customer types between different networks in an island. - different lines companies apply different approaches and values to estimating the interruption costs of the same type of customer. Accordingly, it considers that the proposed approach will deliver net benefits from ensuring consistency between lines companies. That said, the Authority also notes that there are

Submitter	Comment	Authority Comment
	more flexible.	variations in possible approach, and that the relative pros and cons will need to be worked through
Pacific Aluminium	No comment.	
Powerco	Powerco agrees with the proposed approach to determine the VoLL of lines company feeders. There will need to be an ability to identify and consider specific high value loads; in essence, rating each feeder according to its highest value load.	Noted
Transpower	No comment.	
Vector	No comment.	
Question 7: Please provide reasons if you agree that issues with lines companies' incentives and contractual ability are likely to severely reduce the potential effectiveness of a voluntary AUFLS tender. Please also provide reasons if you disagree.		
Contact	No comment.	The Authority notes submitters' positions.
MEUG	MEUG considers that issues with lines companies' incentives and contractual ability are likely to severely reduce the potential effectiveness of a voluntary AUFLS tender if it is assumed that lines companies will always in the future be the counterparty to the System Operator for procurement. However, MEUG believes that in the near and longer term, the best counterparties or providers of AUFLS will be end customers and or their agent retailers or aggregators. This change will be facilitated by changes in technology.	
Meridian	Meridian's view is that if a voluntary tender was part of the Code then the model UoSA would allow the lines companies to participate. However, the incentives for participation may be weak which could reduce the effectiveness of a voluntary tender process and require a backstop measure if the voluntary tender resulted in	

Submitter	Comment	Authority Comment
	insufficient AUFLS procurement.	
New Zealand Steel	No comment.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Orion agrees that an issue with lines companies' contractual ability is likely to severely reduce the potential effectiveness of a voluntary AUFLS tender.	
Pacific Aluminium	No comment.	
Powerco	Powerco agrees that issues with lines companies' incentives and contractual ability are likely to severely reduce the potential effectiveness of a voluntary AUFLS tender due to the reasoning outlined in section 3.13 of the consultation paper.	
Transpower	The issues that may arise from a direct step to a voluntary AUFLS tender is more to do with an ability to provide certainty of AUFLS availability than the incentives and contractual ability of EDBs. The potential and consequences of an AUFLS availability shortfall needs to be understood before this option is explored further, both from the perspective of system security and the potential influence on energy price.	
Vector	No comment.	
Question 8: Do you have any comments on relative ranking of the options?		
Contact	No comment.	
MEUG	MEUG agrees with the analysis and results from the quantitative cost benefit analysis. However, MEUG is unsure that additional step of using the NPV	

Submitter	Comment	Authority Comment
	results in the cost benefit analysis as a sub set, and the input into a broader weighting of quantified and non-quantified ranking adds much to the quality of deciding the preferred option. The fact that the preferred option ranks highest on both the cost-benefit-analysis and the relative ranking approach is fortuitous. Therefore, MEUG does not have to make a choice between an option that scored highest in the relative ranking approach but was not the highest using NPV alone.	
Meridian	Meridian agrees that optimisation, with compensation and centralised VoLL estimation is the preferred option.	
New Zealand Steel	NZ Steel agrees with the analysis and the results from the quantitative cost benefit analysis.	
Norske Skog Tasman	Norske Skog's view is that the scoring system is based on the optimisation model being infallible. If that assumption turns out to be incorrect, then the scores are likely to be incorrect.	
Northpower	No comment.	
Orion New Zealand Ltd	Any cost benefit analysis contains assumptions and detail (in this case) that is difficult to critique. One assumption leads to many others. Orion is concerned about: - the 'central VoLL' process, which introduces uncertainty of outcome (and hence uncertainty in actual VoLL as opposed to the theory of the model); and - the 'compensation' aspects, which adds unnecessary complexity and perhaps precedents. A more staged approach excluding these aspects initially is appropriate. In particular, Orion recommends that the Authority should: - delay any material AUFLS regulatory changes until it has undertaken a higher level review of how DSM, IL and AUFLS can be better managed through greater transparency of	

Submitter	Comment	Authority Comment
	information and coordinated systems; • require Transpower to analyse the current arming of AUFLS on a national, island and suitable regional basis to develop daily and seasonal profile information; • ascertain the need for daily or seasonal changes to the level of arming; • enable Transpower to specifically request some distributors to arm at different levels (varying around the 10%, 10%, 6% and 6% applying to other distributors) to achieve optimal arming; • ascertain the need for an 'automated real time' arming process by a small number of regionally significant distributors; and • raise the awareness of distributors (through sample calculations) of the VoLL benefits to customers of AUFLS relays being implemented over time on lower voltage and lower VoLL feeders (rather than GXP sub-transmission feeders). In the medium term, and subject to the above learning: • regulate the implementation of AUFLS relays on low VoLL feeders by including a customer type priority table (similar or the same as the Rolling Outage table); and • consider the implementation of standby AUFLS on other feeders to provide the ability to rotate AUFLS arming during rolling outage events If it is economically appropriate through an exemption process, enable direct connect customers with suitable IL load to be exempt from AUFLS.	
Pacific Aluminium	No comment.	
Powerco	Powerco considers that the Authority has used an adequate methodology with sensible criteria and weightings. The	

Submitter	Comment	Authority Comment
	information available and used for the analysis should have resulted in an accurate ranking of options.	
Transpower	In Transpower's view, the options assessment and CBA were difficult to reconcile. For example, “base benefits” do not appear to be recognised in the options assessment. With reference to tables 4 and 8 in the paper (‘option scoring table’) Transpower considers it would be helpful to analyse stage two options in isolation from the stage one changes. This will ensure the relative costs and benefits of these options are transparent. An indicative analysis such as this is particularly susceptible to assumptions. It is very easy to underweight costs and overweight benefits – especially where complex solutions are involved.	
Vector	No comment.	
Question 9: Do you have any comments on the proposed timetable?		
Contact	No comment.	The Authority notes the timing concerns, and will discuss with the system operator a potentially revised timetable, and produce more information for industry participants.
MEUG	The Authority provided MEUG more details on timing on 26 February. That explanation was helpful. As the Authority firms up on details of the future process MEUG suggests that the market be informed as promptly as is practicable.	
Meridian	No comment.	
New Zealand Steel	NZ Steel’s exemption expires at the latest on 30 Sep 2015 and our final position may not be implemented by then. Any potential gap needs to be recognised and covered.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	

Submitter	Comment	Authority Comment
Orion New Zealand Ltd	Not applicable to a south island distributor, but considers that the timetable could be achieved.	
Pacific Aluminium	No comment.	
Powerco	Powerco believes that the timeline currently proposed is not practicable because: - the proposed technical and procurement changes required to implement the preferred reserves option are significant and would require extensive physical system and 'back room changes'; - the industry is already resource constrained with respect to staff with the expertise and experience needed to conduct the work to implement and manage a new AUFLS system (Powerco estimates that it will take the equivalent of two FTEs two years to get it ready for the change, not including the physical work required in the field). Powerco recommends that the Authority conduct further consultation with the industry to develop a more realistic and feasible implementation plan and timeline. Powerco considers that the Authority should delay the proposed 'go live' date by two years to the end of 2018.	
Transpower	Transpower has reservations about whether the timetable is achievable due to the number of operational policy decisions still to be made.	
Vector	Vector recommends that the Authority give the industry sufficient time to prepare themselves for the implementation of any newly proposed regime, and give itself the time to properly consider submission feedback before embarking on significant changes such as Code amendments.	

Submitter	Comment	Authority Comment
Question 10: Do you need any more information to help you plan your resource availability to meet the requirements set out in paragraph 4.1.9		
Contact	No comment.	See Authority comment for previous question.
MEUG	It is important to keep parties informed of any changes to or additional details of the implementation timetable.	
Meridian	Not applicable.	
New Zealand Steel	NZ Steel considers that keeping parties informed of any changes to or additional details of the implementation timetable would be useful.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Not applicable to a south island distributor.	
Pacific Aluminium	No comment.	
Powerco	Powerco considers that it is unable to consider resource requirements as there are too many unanswered questions and decisions that would need further discussion. For example: - How does the Authority see the relay upgrade process working? - Will there be a central design and preferred relay type? - Could the System Operator manage a turnkey design and build process, supplying and installing relays across all participants or will each participant be responsible for their own relay upgrades?	
Transpower	To better understand the System Operator's resource planning, the following steps need to be completed: concluding the conceptual design	

Submitter	Comment	Authority Comment
	• drafting, consulting on, concluding, and gazetting Code changes; • engaging the System Operator to build the tool and identify the information requirements; • gathering information; • identifying the initial optimal solution; • identifying the relay capability and settings for each grid connected party; • identifying a transition plan to step from the status quo to the requirements identified in the bullet point directly above (without jeopardizing system security); and • implementing the transition plan.	
Vector	No comment.	
Question 11: Do you have any issues with the potential use of timers for arming AUFLS load?		
Contact	No comment.	The Authority notes submitters' comments.
MEUG	MEUG does not have any issues with the concept of using timers for arming AUFLS load. MEUG supports further investigation of that option because there may be system security and cost saving benefits.	
Meridian	Meridian does not have any issues with the use of timers so long as they are appropriately tested.	
New Zealand Steel	No comment.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Orion does not have any issues with the concept of using timers for arming AUFLS load. It already has one 35MW feeder armed with an AUFLS timer.	

Submitter	Comment	Authority Comment
Pacific Aluminium	No comment.	
Powerco	Powerco does not have an issue with the concept of using timers for arming AUFLS load. However, timers will only be effective on feeders with consistent load profiles. Therefore, if this option is subject to further investigation, the use of time based ripple control signalling should also be considered. Everyday network switching for maintenance and upgrades can change feeder profiles markedly.	
Transpower	Conceptually Transpower does not have any issues with the use of timers so long as they are appropriately tested.	
Vector	No comment.	
Question 12: Do you have comments on the indicative implementation costs used in the CBA?		
Contact	No comment.	The Authority notes the points raised by submitters on this issue, and will revise the assumptions used in its cost-benefit analysis.
MEUG	No comment.	
Meridian	Meridian’s only comment in relation to the cost benefit analysis is that the variation in costs between the different options is sufficiently small that there is no reason to discard the preferred option due to higher costs.	
New Zealand Steel	No comment.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Orion considers that: - the overall the implementation costs for all options are small relative to the varying benefits that can be achieved; and - the common AUFLS percentage options have a higher cost	

Submitter	Comment	Authority Comment
	to replace and test the relays. Although, this is not the case in the longer term as these relays are integrated into the business with shared functionality. Orion recommends that the system operator takes on a more active monitoring role which will incur costs but not to the extent of the optimisation role suggested in the proposal.	
Pacific Aluminium	No comment.	
Powerco	Powerco only considered the costs related to its business, not related to other parties. Powerco considers that \$20K for each relay is a better estimate than \$15K (although more investigation should be done on the actual cost). Although the relays themselves are about \$4-5K out of the box, installation costs can vary depending on the existing cabinet space, and suitability of existing associated equipment such as CTs (current transformers), etc. \$5k seems reasonable for reprogramming existing relays. Powerco considers that approximately 250 of its 290 AUFLS relays would need to be changed.	
Transpower	Transpower considers that the implementation costs of the procurement options are likely to be significantly higher than indicated. The implementation costs outlined imply that it will be the same cost to implement any change. However, it is difficult to identify and quantify implementation costs as little detail has been provided about the starting point for the optimisation process.	
Vector	No comment.	
Question 13: Do you have comments on the indicative on-going costs assumed in the CBA?		

Submitter	Comment	Authority Comment
Contact	No comment.	See answer to previous question.
MEUG	No comment.	
Meridian	Refer to Meridian's answer to question 12.	
New Zealand Steel	No comment.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	No comment.	
Pacific Aluminium	No comment.	
Powerco	Powerco considers that the data and monitoring costs and administration of equivalence arrangements for the stakeholders have been underestimated. Further work with stakeholders needs to occur to improve the accuracy of the figures.	
Transpower	Transpower considers that on-going costs are likely to be significantly higher for the 'optimisation' options. For example, it is unclear how often re-optimisations and consequential re-setting and or requirement for new relay capability will occur. The cost of re-setting and re-commissioning relays and the cost of installing and commissioning new relays could mount quite quickly.	
Vector	No comment.	
Question 14: Do you have comments on the indicative base level and future benefits assumed in the CBA?		
Contact	No comment.	The Authority notes those comments made by
MEUG	No comment.	

Submitter	Comment	Authority Comment
Meridian	Refer to Meridian's answer to question 12.	submitters.
New Zealand Steel	No comment.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Orion considers that the accuracy is coarse.	
Pacific Aluminium	No comment.	
Powerco	Powerco agrees that the proposed technical arrangements will have significant reliability benefits and fully support the four block design. The future benefits related to dynamic monitoring and remote arming/disarming are likely to be substantial as those approaches are capable of delivering higher reliability and security. Possible future advancement towards the operation of a sophisticated model should be considered at all times during technical and procurement design to ensure that structures are in place to allow this to be developed at the earliest opportunity, as Powerco believes that this is where the greatest efficiency benefits lie.	The Authority agrees that the largest single source of benefit is from the revised technical scheme, but notes that the <i>additional</i> sources of benefit from the revised procurement approach are also substantial.
Transpower	In Transpower's view, the improved technical scheme on its own seems to deliver largest gains in reliability and allocative benefits.	
Question 15: Do you have any other comments on the CBA?		
Contact	No comment.	

Submitter	Comment	Authority Comment
MEUG	MEUG congratulates the Authority for under-taking such a detailed estimate of the relative quantitative values. The conclusion of the analysis supporting the preferred option is reasonable and MEUG believes that such conclusions can be considered robust.	The Authority notes the points raised by submitters on this issue, and will revise the assumptions used in its cost-benefit analysis.
Meridian	Refer to Meridian's answer to question 12.	
New Zealand Steel	No comment.	
Norske Skog Tasman	If IR costs increase, energy costs also generally increase. Therefore, if IL is lost in any of the options, the cost of this loss should include higher energy costs.	
Northpower	No comment.	
Orion New Zealand Ltd	According to Orion, there appears to be an opportunity to improve on the current AUFLS arrangements. However, it is not sure that the most simple and cost effective method has been determined.	
Pacific Aluminium	No comment.	
Powerco	According to Powerco, the costs and time associated with the collection of information required by distributors under the preferred option should not be underestimated.	
Transpower	No comment.	
Vector	No comment.	
Question 16: Do you have comments on the proposed compensation payment mechanism?		
Contact	Contact supports an approach that: explicitly compensates stakeholders for the costs involved in arming feeders for AUFLS, with the compensation payments being recovered on the basis of annual demand; and	The Authority notes the points raised by submitters, and agrees that the level of detail needs to be commensurate with the scale of benefit. This will be

Submitter	Comment	Authority Comment
	has no net cost recovery from participants as the costs allocated would equal the AUFLS payments made.	a design detail worked through with industry.
MEUG	MEUG considers that the proposal in the paper is very high level. There will be many alternatives on how the overall approach could be implemented. The complexity of the compensation payment mechanism needs to be commensurate with the scale of the dollar values involved. Those are expected to be an order of magnitude less than annual turnover in the existing ancillary markets for IR or FK.	
Meridian	Meridian supports the pragmatic approach taken in regards to the compensation payment mechanism, particularly: - simplicity of an annual process; - net approach; - payments = costs; and - combination of relay compensation and expected load shedding compensation.	
New Zealand Steel	NZ Steel considers that this seems acceptable.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Orion believes the proposed compensation payment mechanism is not required to achieve good AUFLS outcomes. This is because almost all distributors have at least 32% of their customer base falling into what could be considered a common low VoLL category. Therefore, the need to inter-network optimise is largely negated. In that environment, the compensation amount will be trivial and its benefit is questionable.	The Authority notes the VoLL issue raised by Orion, but also notes that a large proportion of the benefit of a payment mechanism is through incentivising the provision of enhanced AUFLS services that will deliver superior system security outcomes.
Pacific Aluminium	No comment.	Noted
Powerco	Powerco considers that the proposed compensation payment	

Submitter	Comment	Authority Comment
	mechanism appears to be the simplest available to: • fairly compensate distributors; and • provide strong incentives to incorporate new technology and minimise the capital costs of relays. Before Powerco can fully support the proposed mechanism, it requires more information, such as how compensation for the cost of relays would work in detail. Further consultation with the industry would be appropriate to achieve this.	
Transpower	No comment.	
Vector	Vector supports the introduction of a payment system and considers that it is an appropriate alternative to granting AUFLS exemptions. However, according to Vector, the current proposal does not adequately provide the right incentives for all distributors because: • compensation charges incurred by distributors not selected to provide AUFLS will be paid by their customers, and not the distributors themselves; • compensation received by distributors that provide AUFLS will be treated as regulated revenue and passed through to its customers (i.e. through lower lines charges); and • distributors themselves (or at least those distributors subject to a default price-quality path (DPP) regulation) will not bear the costs of the payments, and will not be able to keep any compensation received. A better alternative would be to create a regime where distributors incur part of the costs and in turn get to keep part of the compensation. This could be achieved by allowing the	The Authority notes the incentive issue raised by Vector, and is considering splitting compensation payments into 'standard' and 'enhanced' AUFLS service, thereby enabling suitable treatment by the Commerce Commission for enhanced payments. It is hopeful that a pragmatic arrangement can be developed that preserves the incentives for lines companies to invest in delivering enhanced services.

Submitter	Comment	Authority Comment
	payment to be treated as part- regulated and part- unregulated. The balance between regulated and unregulated compensation payments should be based on an assessment of the cost and the value to consumers of distributor investment in new relay technologies. This will ensure that customers receive compensation payments, while providing distributors with incentives to actively participate in the regime. However, this proposal will require the Commerce Commission's endorsement and approval, and potentially the amendment of the Commerce Act (Electricity Distribution Services Input Methodologies) Determination 2012. In addition, under the DPP distributors must not breach their price-path, which include pass-through costs. Consequently, volatility or unforeseeable payments/pass-through costs can increase the risk that distributors will breach their price paths, without the ability to manage this risk when setting their annual prices. Vector recommends the Authority work to with the Commerce Commission to ensure that AUFLS payments do not pose price-path compliance risks for non-exempt distributors. For example: • by ensuring that compensation payments are passed through on a lagged basis only; and • providing a “wash-up” mechanism where any variance between the forecast of the compensation payments and actual compensation payments within a year is recovered in a subsequent year.	
Question 17: Please provide reasons if you agree that, in an arrangement where different stakeholders are required to provide different		

Submitter	Comment	Authority Comment
proportions of their load as AUFLS based on their relative suitability, it is appropriate to compensate stakeholders for the costs they incur in providing AUFLS. Please also provide reasons if you disagree.		
Contact	Contact agrees that compensating stakeholders for the costs they incur in providing AUFLS is appropriate. This is because it is a fair approach to solving the issue of providing the capacity required for the AUFLS scheme so that the integrity of the grid is maintained for low probability, high impact events. Under the proposed optimisation those that can achieve a higher value from load than providing AUFLS can do so by pricing the load accordingly. Contact supports the cost allocation approach that sees the net cost to most participants being relatively small with those providing more AUFLS having a benefit rather than a cost. However, Contract would not support a methodology that allocated cost by event (i.e. an onerous event charge due to infrequent operation of the AUFLS). This is because: • event charges do not drive improved reliability as the commercial drivers to make plant more reliable are greater; and • imposing charges through an event or other allocation methodology on Transpower or generators will provide a subsequent market effect (for example, see the Transpower examples provided in the paper (E.1.22 & E.1.14) and with the Clutha HAMI TPM example provided in Contact's feedback to the Electricity Authority's Transmission Pricing Methodology CBA working paper).	The Authority notes submitters' positions on this.
MEUG	MEUG agrees that parties that provide AUFLS should be compensated for their costs. An important cost is the expected cost, that is the customer specific VoLL, of being dispatched in an AUFLS event. Parties that do not provide AUFLS should not be compensated.	

Submitter	Comment	Authority Comment
Meridian	Meridian agrees that a compensation payment mechanism is appropriate given the disproportionate provision among stakeholders.	
New Zealand Steel	NZ Steel agrees that the rationale seems acceptable.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Orion agrees that it is appropriate to compensate stakeholders for the costs they incur in providing AUFLS if the costs to stakeholders vary significantly. However, Orion does not believe that the costs vary significantly, and the idea that AUFLS implementation costs can be ring fenced in the future is optimistic. In Orion's view, it will become a nominal component of the compensation rather than something that reflects actual cost.	
Pacific Aluminium	No comment.	
Powerco	Powerco agrees that it is appropriate to compensate stakeholders for the costs they incur in providing AUFLS. This is because providing appropriate compensation can: • incentivise those best placed to provide AUFLS load efficiently to do so; and • disincentivise actions to avoid AUFLS obligations.	
Transpower	No comment.	
Vector	See comments to question 16 above.	
Question 18: Based on your experiences of the existing AUFLS and PROPs arrangements, do you have any views on the appropriate approach to ensure consistency of the two arrangements?		
Contact	No comment.	The Authority notes the submissions put forward by
MEUG	In MEUG's view, a pragmatic approach that is consistent with the	

Submitter	Comment	Authority Comment
	way in which the System Operator implements PROPS should be sufficient to ensure consistency between implementing procurement of AUFLS and modifying PROPS for the new AUFLS blocks.	on this issue, and has refined its approach to the treatment of AUFLS and PROPS.
Meridian	Meridian has no views other than to agree that aiming for consistency of AUFLS and PROPs arrangements and minimising duplication of data collection are good ideas.	
New Zealand Steel	NZ Steel agrees with MEUG's response to this question.	
Norske Skog Tasman	No comment.	
Northpower	No comment.	
Orion New Zealand Ltd	Orion believes that consideration could be given to the implementation of standby AUFLS on other feeders to provide the ability to rotate AUFLS arming during rolling outage events. The incremental cost of this arrangement would be small because a zone substation relay can control many feeders and not all feeders will be low VoLL feeders so that the remainder of the feeders become the backup. Once again this would take time to cost effectively implement during protection system replacement projects. Alternatively, a more basic lumped load approach could be taken at the GXP level as a backup during rolling outages.	
Pacific Aluminium	No comment.	
Powerco	An AUFLS event generally occurs without warning. However, Powerco considers that PROPs should be incorporated into the optimisation tool as a situation could develop where a series of constraints may be in place when PROPs are already in effect, which this could lead to an AUFLS tripping.	
Transpower	Transpower agrees that the integrity of the system to withstand	

Submitter	Comment	Authority Comment
	an event that triggers AUFLS should not be compromised if system security situations require rolling outages. The existing relationship between AUFLS and PROP arrangements should be retained.	
Vector	Vector supports the proposal to coordinate and account for competing load uses. However, Vector: • considers that it is unclear how the proposal will ensure minimal impact on direct-connects and distributors' ability to offer load into the IL market; • considers that the Authority's proposal ought to ensure that it does not affect parties to the extent that they are effectively forced to exit the IL market, or modify the amount of load they themselves would typically offer, or offer on behalf of a third party; • considers that the proposal needs to ensure that it does not prevent any parties from entering the IL market; and • recommends that the Authority and the System Operator undertake further consultation with the industry on how the proposed regime will coordinate with other load uses (PROP, IL, DR (including DR by third parties)) and grid emergencies, before implementation.	
Question 19: Do you have any comments / suggestions about the historical load information requirements on stakeholders?		
Contact	No comment.	The Authority notes that the provision of information is an important aspect of giving the system operator sufficient visibility of what load is armed for AUFLS. However, it also agrees that it is important that a mechanism is developed which can strike the correct balance between information visibility, and compliance burden on participants. This is a point of
MEUG	No comment.	
Meridian	Not applicable.	
New Zealand Steel	NZ Steel can easily provide the suggested historical requirement of one or two years' worth of load data	
Norske Skog Tasman	No comment.	
Northpower	No comment.	

Submitter	Comment	Authority Comment
Orion New Zealand Ltd	Orion considers that changing load profiles, or open points on a distributor's network is a problem that is best addressed in real time through dynamic arming. It is not practical for distributors to resubmit or provide regular updates to feeder loading every time something changes. This issue reiterates the importance of having an AUFLS 'slack provider' that can fine tune in real time.	detail that will be worked through with participants.
Pacific Aluminium	No comment.	
Powerco	Powerco considers that collating the required amount of data will be a considerable task regardless of whether the data needs to be collected for all feeders or just those currently enabled. Further consultation needs to occur with the industry to size this task.	
Transpower	Transpower considers that when developing the revised AUFLS design, it has identified an increase in the information requirements to assist it in implementing its technical proposal. In addition to those requirements, any further information will largely be driven by the details of the selection process and the parameters of any "optimisation model" that needs to be developed. This means the "information requirements" for load data may need to wait until the tool parameters and inputs have been developed.	
Vector	Vector agrees that under the proposal it will be necessary to provide the System Operator with particulars about load and load shedding capabilities. However: • certain types of information may be relevant and easily obtainable for one type of load, while not relevant or overly onerous for other types; and • all parties may not be able to dedicate (approximately)	

Submitter	Comment	Authority Comment
	0.2FTE to the implementation of the regime (as specified in the CBA); Therefore, Vector recommends that: - any requests for information must be properly targeted and the System Operator ought to be able to demonstrate that the information sought is fit for purpose and not excessively costly to provide; - the Authority and the System Operator bear in mind resourcing and timing constraints direct-connects and distributors face under existing information disclosure regimes and assess whether further disclosure requirements are justified under cost-benefit analysis, and in the long term interests of consumers before imposing any new information disclosure regimes.	
Question 20: Are there any other technical reasons (other than load shape, or the VoLL of customers connected to it) why a feeder may not be suitable for AUFLS?		
Contact	No comment.	The Authority notes the issues raised on this matter, and has amended the example selection methodology accordingly.
MEUG	Individual MEUG members will provide information and examples of feeders that may not be suitable for AUFLS.	
Meridian	No comment.	
New Zealand Steel	NZ Steel has two feeders that it considers are not suitable for AUFLS, and should not contribute to any future AUFLS payment that the company may have to make. These two feeders (in parallel) supply part of the Glenbrook site (the Iron Plant) which includes the auxiliaries of onsite cogeneration. Tripping these feeders will drop about 20MW of load and also about 2-3 times that amount of generation. After tripping, the net amount of load on the grid will therefore increase.	
Norske Skog Tasman	No comment.	

Submitter	Comment	Authority Comment
Northpower	No comment.	
Orion New Zealand Ltd	When choosing feeders for AUFLS, some consideration should be given to whether the feeder is on: - an automatic under voltage shedding scheme; or - the priority list of feeders to be disconnected for grid emergencies.	
Pacific Aluminium	No comment.	
Powerco	Some feeders will be unsuitable for AUFLS due to network configuration. For example, where a local service supplies for zone substations are being supplied by specific feeders.	
Transpower	No comment.	
Vector	No comment.	
Question 21: Do you have any other comments?		
Contact	No comment.	Noted
MEUG	MEUG considers that it is necessary to implement the technical standards for extended reserves in the North Island as soon as possible.	
Meridian	Meridian supports transparency of the optimisation process and the criteria for selecting AUFLS load. The methodology should be public and open to review. A transparent process will build confidence that the optimisation process is resulting in efficient AUFLS procurement.	
New Zealand Steel	No comment.	
Norske Skog Tasman	In Norske Skog's view: the Authority "expects the industry to have blind faith in its optimisation model for AUFLS, despite providing scant	The Authority notes that the proposed approach does address the inherent uncertainty with load

Submitter	Comment	Authority Comment
	<i>details of its formulation and assumptions";</i> • it would be better to use a stochastic model, where uncertain parameters are represented as probability distributions, rather than a deterministic model, where everything is assumed to be known with 100% certainty; • the Authority should "<i>stop in its tracks, provide the formulation and the code and data files for its optimisation model to the public and re-consult</i>".	using a stochastic approach. It also intends that the prototype model be audited and tested by the system operator and the formulation be available for wider audit.
Northpower	Northpower considers that: • any change from current code mechanisms to a market trading mechanism should be more fully debated with participants (including Northpower); • the feasibility, costs and benefits of establishing trading mechanisms should be more clearly quantified before decisions or assumptions are made that lead participants further towards the procurement of extended reserves; • existing arrangements should prevail whilst making desired technical adjustments, at least until such time as centralised control of the AUFLS system becomes a reality. The most expedient, simple and fair way of handling this issue in the short/medium term is the third option in Executive Summary Table 1 - AUFLS procurement options considered: This avoids setup and on-going market costs involved in VoLL 'trading'; • protection should continue to be given by way of an exemption for the nationally important strategic asset located within Northpower's network area at Bream Bay; and • mitigating the effect of AUFLS for such a customer by using market forces and potentially a very high VoLL, is not a fair or reasonable burden for a single customer (or even for a single network company).	The Authority notes the concerns raised, and believes that the outcomes desired by Northpower, particularly with respect to whether the refinery should be placed under AUFLS, will be delivered by the proposed approach

Submitter	Comment	Authority Comment
Orion New Zealand Ltd	Orion consider that: - the consultation paper failed to address a number of important issues; - the proposed Transpower technical changes will largely deal with the risk of collapse due to over or under arming. The risk of over or under arming can be managed more simply than the proposal; - the proposal is too complex to be an effective approach for dealing with a handful of unique (as defined by high VoLL or chunky load) direct connects; - the greatest potential to reduce AUFLS VoLL costs is continual improvement to feeder selection within the distribution networks and refinement of the arming at a regional level to ensure that participants do not arm any more than is needed to curtail system collapse; - the proposal places too much emphasis on AUFLS arrangements that have equitable VoLL outcomes; - it is unnecessary to identify beneficiaries and costs associated with AUFLS events. Orion estimates the annual VoLL on its network for normal day to day outages to be in the order of \$10m per annum and it does not seek to equitably distribute the VoLL costs associated with those events. There are many reasons on a distribution network why the price-quality equation for its customers is different all over the network, and AUFLS is absolutely noise level; - the focus should be on a regime that minimises VoLL as efficiently as possible rather introducing extra complexity through compensation to achieve equitable VoLL outcomes; - it is unclear that the incentives of direct connects to supply the correct VoLL are aligned with the outcome the proposal seeks. Whether a customer is a direct connect or not should	The Authority notes Orion's concerns, and will continue to work with Orion and other stakeholders in developing some of the detailed aspects of the selection methodology approach. The Authority also notes that a large proportion of the benefits from the proposed approach are through delivering improved system security outcomes, over and above that from the Transpower proposed technical changes. Without these security benefits, it is likely that a simpler approach similar to that proposed by Orion would be more appropriate.

Submitter	Comment	Authority Comment
	not determine whether their VoLL is determined by them or a central mechanism; - it is not practical to ring fence the cost of AUFLS relays. AUFLS is a function in a modern relay and not a separate asset and therefore compensation for provision of AUFLS relays is problematic; and - the AUFLS options jump from static arming to an optimisation and compensation solution for everyone. There is a middle ground that achieves the benefits at a lower cost and prevents the need for a solution that may conflict with other DSM initiatives later.	
Pacific Aluminium	No comment.	
Powerco	Powerco: - agrees that the Authority's preferred procurement option adequately addresses the AUFLS procurement problem; - states that its support for the preferred option over the other options is subject to see a satisfactory design of the detail of the Code relating to the provision of information, the estimation of VoLL, and the implementation of the cost compensation model (Powerco would welcome the opportunity to be involved in the development of those provisions); and - believes that the capacity to apply more sophisticated AUFLS solutions, such as real time arming, disarming of AUFLS, via minor changes to existing demand management and SCADA applications, may already exist to a greater extent than the Authority believes.	Noted
Transpower	Transpower considers that: the interests of consumers may be better served by the Authority adopting a staged approach to AUFLS reform – splitting implementation of the technical change from detailed design and implementation of any new procurement	The Authority notes Transpower's suggestion about a staged approach, and will be revising its CBA to explicitly address this proposal.

Submitter	Comment	Authority Comment
	process; - the consultation paper does not specify how the optimisation tool will be specified, who will be responsible for its development or its output, and the requirement for any third party audit. The model should be specified, developed, and audited in a similar manner to the modelling system used to provide the schedule of quantities and prices; - the integrity of the system to withstand an AUFLS event should not be compromised if rolling outage events occur; and - load providers should maintain load for both purposes concurrently as now.	The Authority will continue to work with Transpower and other stakeholders on the details of the approach The Authority agrees that system security is the most important factor, and notes that the desire to deliver the best system security outcome is one of the biggest drivers of its preferred approach.
Vector	Vector: - in principle supports the Authority's objectives; - is not convinced that the proposal will work in practice; - recommends that the System Operator be required to consult on its distributor VoLL estimates to allow direct-connects and distributors and load owners an opportunity to have their say, before finalising the AUFLS allocation; - is concerned that in practice under the proposed changes certain direct-connects and/or distributors will be required to provide a disproportionate amount of AUFLS. This would create presentational difficulties for the industry, and reputational risks for distributors, the System Operator and the Authority; - recommends that the proposal include a cap on the proportion that any single stakeholder could be asked to provide. This is because any proportion of AUFLS a single stakeholder is required to provide will impact on its ability to respond to other network emergencies, such as unplanned outages or a grid emergency;	The Authority notes the issues raised by Vector, and notes that it will continue to work with Vector and other stakeholders with regards to developing the operational details of the arrangements. It notes the concerns about different parties providing different proportions of AUFLS, but notes that the Authority is bound by its statutory obligations to promote options that will deliver the greatest long-term benefit to consumers in aggregate.

Submitter	Comment	Authority Comment
	• recommends the System Operator be required to consult with individual direct-connects and distributors before finalising decisions on how to allocate AUFLS (and direct-connects and distributors should be able to challenge the System Operator's decisions); and • recommends that the final proposal provide clearer information and greater certainty around the length of time that an AUFLS selection will apply.	