Credible Event Management: Summary of submissions and System Operator response, December 2009.

Submitter Generator	Comment	Response
1.1	Consider the definition of an ECE event. Previously ECE have been used to manage system frequency events that might have lead to cascade failure.	In the SO's view, the existing ECE classification should not be restricted to system frequency events that might lead to cascade failure. The SO must act reasonably and prudently to manage all credible events that could result in cascade failure using appropriate available measures. As there is currently only one event classified as an ECE (the loss of the bipole), the current management measures listed for ECE management (operation of AUFLS and reserves, where required) are tailored for this event. We do not believe, from a PPO perspective, that there is a restriction on adding events and management measures (such as a load shedding scheme) to this classification. The re-classification of the loss of an interconnecting transformer or busbar section as an ECE event, in our view, is a reasonable and prudent action to enhance operational security and mitigate the risk of subsequent trippings, voltage collapse, and cascade failure. (Refer also to comment/response 2.6)
1.2	Meridian does not support any changes until we have confirmation from the Grid Owner that they are ready to meet the new security policy standards. For example, Meridian envisages a number of problems if this was applied to Southland 110kV interconnectors or ROX 110kV busbar. Meridian notes that if this analysis is correct the grid reliability investigation currently under way will support investment to meet the security policy. However, Meridian considers it unlikely that this could happen before September 2010.	This review does not place any requirement on the Grid Owner to make any additional network investment (Refer also to comment/response 1.4). This review is related to operational security and makes recommendations related to the management of credible events. The power system is designed and developed to meet reliability standards, namely the grid reliability standard (GRS); all proposed investments are subject to economic justification. The management of the loss of a transformer or busbar section as an ECE event will rely on post event load disconnection schemes and will not require generation to be constrained on.

Submitter Generator	Comment	Response
1.3	We understand from our discussions with the system operator that additional instantaneous reserve won't be required in the South Island to cover the ECE risk of a busbar that might lead to the loss of 360MW of generation. However we remain concerned as it doesn't appear that the system operator has carried out robust analysis to be certain. Therefore we request that this analysis is carried out.	South Island – reserve requirements To manage the contingent event of the loss of a single generator unit in the South Island, 120MW of reserve is procured (typically a single Manapouri unit). The largest loss of generation associated with the loss of a busbar section is 360MW at Manapouri. Therefore, the maximum additional loss of generation associated with a busbar event is 240MW (360-120 = 240MW). The System Operator proposes to manage the busbar loss through AUFLS (generally 1/3 of total South Island load). The minimum South Island load over the period Nov 2007 to Nov 09 was 960 MW; this indicates a minimum AUFLS reserve of 320MW. Additional reserve based on the ECE risk associated with the loss of a busbar section will therefore only be required if the additional loss of generation is greater than the amount of AUFLS procured. This argument holds for both north and south HVDC transfer. The above values indicate that no additional reserves will be required.
1.4	Applying the risk management policy for "ECE for overloading" on core grid assets makes sense as there is a frame work for investment through the EGRs to enable appropriate investment to be made (I.e. guaranteed N-1). However we need to be careful not to apply this standard to assets where customers are able to choose the level of security that is appropriate to their needs (i.e. connection and potentially non core grid).	Under the new proposal, the System Operator would endeavour to manage the loss of a 220kV interconnecting transformer; a 220kV, 110kV busbar section; and 66kV core grid connected 66kV busbar section as an ECE. However, the management measures are not intended to maintain supply to GXPs and therefore, the loss of a transformer or busbar section may result in unavoidable load loss. Planned load shedding schemes would only be triggered post-event, where it is possible to reduce the amount of unplanned load shedding that would otherwise have taken place. The System Operator believes that all customers would opt for the application of planned load shedding measures that minimise the amount of unplanned load shedding that would otherwise have taken place. Especially as the development of planned load shedding measures come at no extra cost to the customer.

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1.5	We think that it is reasonable to suspend the need to manage "ECE for overloading" during short term outages on interconnecting transformers and busbars. The costs of management options or complexity of inter trips to cover short periods of time during outages potentially don't justify the benefits. Applying a blanket rule is not necessarily the most efficient outcome. We believe the system operator should not be required to cover the risk of busbar or interconnecting transformer during short term outages.	The System Operator has the obligation to use available measures to avoid over loading of equipment during planned outages. Such measures may include the application of planned post-event load shedding to avoid widespread unplanned loss of supply. For all planned outages, the System Operator and/or the Grid Owner engages with distributors and generators to minimise potential risks and puts management procedures in place to manage risks as appropriate.

Submitter Other	Comment	Response
2.1	Paragraph 1 on page 18 of the Summary of Findings document states that post-event generation dispatch is not assumed. This doesn't seem to be consistent with the parallel circuit ratings used by the Grid Owner which are calculated on a 15 minute off-load time. There is an assumption that generation can be re-dispatched or load curtailed within 15 minutes.	The cost comparison is a relative one. To allow comparison of event consequences and the potential cost of event management, event consequences and costs were based upon the amount of potential planned or unplanned load shedding that would take place.
2.2	On page 41 of the Summary of Findings, consideration of the Haywards 220kV bus section fault doesn't appear to have allowed for the HVDC north runback and voltage stabilising controls which may avoid the voltage collapse that is considered to occur. Further, if loss of interconnecting capacity during high HVDC transfers results in transformers exceeding 24hr post-contingent ratings, would the HVDC transfer level not be reduced to mitigate this problem?	Although there is HVDC runback capability, this is currently not used for management of the loss of either a transformer or busbar section. The existing controller does not have the spare capacity required for the addition of run-back schemes associated with transformer and busbar section events. It is envisaged that following the introduction of the new HVDC pole and HVDC controller system, the SO will be able to reduce the HVDC transfer as a post ECE measure following the loss of a transformer or busbar section. This capability is assumed, in the ECE cost calculations, to be available post 2012.

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2.3	On page 54 loss of SPS is listed as a credible event. Do SPSs have full redundancy such that their failure could be treated as an ECE, i.e. a double contingency.	System Operator will delete reference to the loss of protection communication and/or special protection schemes as a credible event.
2.4	The potential lost load costs calculated are only for that part of the demand duration curve that may not be met in an ideal situation, i.e. exactly that load that may not be met above the N-1 capability line. In reality most or all of the load would be tripped unless a very accurate load shedding scheme was provided, i.e. should the cost calculation use the full load above the N-1 capability line?	The System Operator will apply an accurate load shedding scheme based on circuit breaker status and/or asset loading.
2.5	Appendix 1 indicates that multiple generator trippings have a shorter return time than bipole trippings, yet the loss of a bipole is classified as an ECE while the near-simultaneous loss of multiple generators is classes as an 'other event'.	Appendix 1 makes no reference to return times for multiple generator trippings and HVDC bipole trips. In the SO's view, historical data related to the near simultaneous loss of multiple generators gives no indication that it should be re-classified.
2.6	As raised at the workshop, it would be much clearer if different names could be given to under-frequency type ECE events and load curtailment type ECE events.	All ECE events will rely on a form of post event planned (involuntary) load shedding and the requirement for additional reserves will be assessed. The management measure employed will depend upon event consequences. The consequence of an ECE event may trigger AUFLS, alternatively events may trigger planned post event load shedding schemes. (Refer also to comment/response 1.1)