

Security Policy Review: Credible Event Management

Appendix 8 – Proposed Policy Statement Changes

December 2009



SYSTEM OPERATOR

Keeping the energy flowing

TRANSPower



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Appendix 8 – Proposed Policy Statement Changes

Proposed Changes to Risk Management Policy (proposed changes are underlined)

RISK MANAGEMENT POLICIES

Identification and Application

12. The **system operator** will seek to manage the outcomes of events that may cause cascade failure by:
- 12.1 Identifying potential credible events (each an 'event') on the power system as a result of **asset** failure that may result in cascade failure. At the date of this **policy statement** the **system operator** has identified the following credible events that may result in cascade failure, due to these events causing quality and/or power flow outcomes exceeding **asset** capability:

12.1.1 The loss of one of the following power system components:

- a **generating unit**;
- a 220kV or 110kV **transmission circuit**;
- the **HVDC link** pole (valve group, overhead dc line, or undersea cable);
- an interconnecting transformer (110kV or 220kV)
- a busbar (220kV, 110kV, or 66kV)
- large load or load blocks.
- reactive injections, both when provided as an **ancillary service** or when available from transmission **assets**.

12.1.2 The simultaneous loss of one of the following:

- any combination of two or more of the single power system components in clause 12.1.1;
- two or more **transmission circuits** (on the same transmission tower and on the same transmission corridor or common right of way);

- two or more **generating units**;
- two or more busbar sections (switching station busbar, substation busbar);
- the HVDC link bipole.

Other credible events may be identified during the term of this **policy statement**. This may include events arising in particular temporary circumstances such as, for example, a credible event identified as potentially arising during commissioning.

If during the term of this **policy statement**, the **system operator** identifies a further or other credible event then, subject to operational requirements and as soon as reasonable practicable the **system operator** shall:

- **advise** such further credible event to all participants;
- invite **participants** to comment on such credible event; and
- consider **participants'** comments prior to it implementing mitigation measures for such credible event.

12.2 Assessing each event, or category of events, to estimate the likely risks based on the potential impact on the power system (including on achievement of the **PPOs**), if the event or category of events occurs. Consequence assessment has taken and will take into consideration mitigating factors such as:

- **AUFLS** systems.
- The provision of levels of reserves, where justified for mitigation of **other events**.
- The provision of **constraints** on **dispatch**, where justified for mitigation of **other events**.
- The probability of occurrence based on historical frequency of **asset** failure or other credible reliability information, provided that where the **system operator** has limited historical or other information for specific **assets**, it will consider generic information available to it regarding failure of that type of **asset**.
- The estimated costs and benefits of identified risk management.

- The feasibility and availability of other potential mitigation measures.

12.3 Assigning each of the assessed events to one of the following categories:

- **Contingent events:** Events where the impact, probability of occurrence and estimated cost and benefits of mitigation are considered to justify implementing policies that are intended to be incorporated into the scheduling and **dispatch** processes pre-event.
- **Extended contingent events:** Events for which the impact, probability, cost and benefits are not considered to justify the controls required to totally avoid **demand shedding** and maintain the quality limits defined for **contingent events**.
- **Other events:** Events for which the impact, probability of occurrence and estimated cost and benefits do not justify implementing available controls, or for which no feasible controls exist or have been identified other than unplanned demand reduction, AUFLS and other emergency procedures and/or restoration measures.

12.4 Categorising, at the date of this **policy statement**, the following credible events:

- **Contingent events:**
 - a) The loss of a **transmission circuit**.
 - b) The loss of an **HVDC link** pole.
 - c) The loss of a **generating unit**.
 - d) The loss of both **transmission circuits** of a double circuit line, where the **system operator** has determined a high level of likelihood of occurrence based on historical information.
 - e) The loss of both **transmission circuits** of a double circuit line, where the **system operator** has been advised of a temporary change to environmental or system conditions that give reason to believe there is a high likelihood of occurrence of the simultaneous loss of both circuits. The **system operator** will display on its website a range of environmental or system conditions that it considers may create a high likelihood of

occurrence of simultaneous loss of both circuits (but this list may not be exhaustive and will not limit the definition of the **contingent event**).

- f) The loss of reactive injections, both when provided as **ancillary services** or when available from transmission assets.
- g) The loss of the largest possible load block as a result of a) to f) above for each island.
- **Extended contingent events:**
 - a) The loss of the **HVDC link** bipole.
 - b) The loss of a 220 kV interconnecting transformer.
 - c) The loss of a 220kV or 110kV busbar.
 - d) The loss of a 66kV busbar directly connected to the **core grid**
- **Other events:**
 - a) The loss of both **transmission circuits** of a double circuit line
 - b) The simultaneous loss of two or more of any of the elements in 12.1.1
 - c) The close consecutive loss of two or more of any of the elements in 12.1.1
 - d) The loss of a 66kV busbar not connected to the **core grid**
 - e) The loss of a 110kV interconnecting transformer

12.5 Applying, where possible, the following principles in implementing controls for each of the following category of risk:

- For **contingent events**, the **system operator** will endeavour to schedule and **dispatch** sufficient reserves to provide **asset** redundancy, maintain the levels of quality defined in the Security Policy, and plan to avoid post-event unplanned **demand**

shedding, taking into account any other agreed control measures¹ advised to and agreed by the **system operator**.

- For **extended contingent events**, the **system operator** will plan to maintain the levels of quality defined in the Security Policy through a combination of **AUFLS**, the provision of reserves, **asset** redundancy, planned demand reduction measures, and acceptance of greater quality disturbances than for **contingent events**, taking into account any other agreed control measures advised to and agreed by the **system operator**.
- For **other events**, no planned controls have been identified, other than unplanned demand reduction, AUFLS and other emergency and/or restoration procedures.
- Where, in the **system operator's** reasonable opinion, a credible event is likely to lead to power system instability (a 'stability event'), the **system operator** may rely on **demand shedding to maintain the power system within identified transient and or dynamic stability limits in accordance with clause 74.**

180 **Stability events** are credible events, the occurrence of which, in the **system operator's** reasonable opinion, are likely to lead to power system instability.

¹ For example, demand inter-trips, run-back schemes, and Automatic Under Voltage Load Shedding (AUVLS).