WEM Procedure: Credible Contingency Events

WRIG 8

3.8A Contingency Events

AEMO Obligations

- New AEMO WEM Procedure to describe processes for:
  1. Determination of Credible Contingencies
  2. Reclassification
  3. Notification
  4. Alignment with Technical Rules

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Credible Event classification

- To determine and classify a Contingency Event as a Credible Contingency Event:
  - AEMO must consider the failure or removal from operational service of any single Power System Element as a Credible Contingency Event.
    - AEMO may opt not to consider single element Contingency Events where the probability of occurrence is very low
  - Where AEMO identifies a probable sequence of connected events, AEMO may consider a Contingency Event involving multiple Power System Elements as a Credible Contingency Event.

Power System Elements

Element	Description	Example physical equipment
Node	Electrically equivalent location	Substation busbar, "T-junction" tower on a 3-ended circuit
Branch	Single-circuit connection between two nodes	Overhead transmission line, underground cable, transformer
Single terminal device	Auxiliary network equipment connected to a node	Shunt reactor / capacitor, static VAR compensator
Protection scheme	Scheme that detects an electrical fault and disconnects any other Power System Element to prevent damage.	Special protection scheme designed to disconnect a generator under certain fault conditions
Communications link	Means or path for information flow between nodes	Fibre-optic cable, microwave transmitter
Measurement device or sensor	Source of information about power system conditions	Current transformer, voltage transformer, weather sensor (e.g. temperature, wind speed, solar radiation)
Generation or load system	Producer or consumer of electrical power	Gas-fired generator, transmission connected load

Multiple-element Contingencies

2.1.4. In identifying a probable sequence of connected events for paragraph 2.1.1 (a), AEMO must develop justification based on one or a combination of the following:

(a) Direct advice from an asset owner or expert.

(b) Previous experience of the failure occurring.

(c) Analysis finding a failure likely occurring.

(d) Reclassification

Reclassification Conditions

- Lightning storms, bushfires or other severe weather conditions.
- Pollution, geomagnetic-disturbances or other atmospheric phenomena that may interfere with power system operation.
- The presence of personnel or equipment not normally in the vicinity of the network and other power system assets.
- Any other unusual threats to the power system, generation fuel supplies, communications systems or other supporting infrastructure.

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Reclassification Heuristics

- Documented process:
  - Bushfires
  - Lightening and storm damage
  - On-site works
  - Intermittent or unstable generation
- Must be included as Appendix

☐IMMEDIATE ASSESSMENT FIRE < 1KM FROM THE TRANSMISSION CIRCUITS	☐FORECAST ASSESSMENT FIRE > 1 KM BUT < 5 KM FROM THE TRANSMISSION CIRCUITS	
Time and date of assessment:		
Distance of fire from circuit = km	Start time of risk =	
Transmission circuits being assessed:		
RISK FACTOR	**WEIGHTING**	**NOTES**
FIRE CONFIRMATION • Satellite hot spot indication only • Confirmed fire	 -2 0	Fire confirmation may be via NSP or Fire Services.
FIRE OBSERVER NSP (Asset Owner) Observer • No assessment made • Not likely to impact • Likely to impact OR Fire Service Observer • No assessment made • Not likely to impact Likely to impact	 0 -2 9 OR 0 0 3	Assessment should be made on the basis of either an NSP observer OR a Fire Service observer. If both are available, use the assessment that results in the highest weighting.
CIRCUIT CHARACTERISTICS • Adjacent single circuits • Double circuits (single towers)	 1 2	
WEATHER Fire Weather Warning level[2] • Low-medium • High • Very High • Severe • Extreme (including total fire ban) • Catastrophic (Code Red)	 1 2 3 4 5 6	Sourced from Bureau of Meteorology.
EASEMENT Internal fuel load • Low • High External (Adjacent fuel load) • Grasslands • Shrubs • Plantations/dense bush[1]	 1 2 1 2 3	Based on information from NSP, on-site personnel or via Indji Watch.