WEM Procedure: Emergency Operating State WRIG

October 2021

WEM Rules Clause 3.5.1A

Tranche 2 & 3
Consolidated Companion Versions
Effective Oct '22

3.5.1. The SWIS is in an Emergency Operating State when AEMO considers that circumstances exist on the SWIS that impact the ability of AEMO to operate the SWIS as intended in accordance with these WEM Rules

3.5.1A AEMO must develop a WEM Procedure which sets out conditions under which AEMO may declare an Emergency Operating State. To avoid doubt, the WEM Procedure referred to in this clause 3.5.1A does not limit the ability of AEMO to declare an Emergency Operating State.

The WEM Rules give broad discretion to AEMO, noting that:

- EOS conditions are unpredictable
- An exhaustive list is not feasible
- EOS should be an exceptional event (rarely invoked, we hope)

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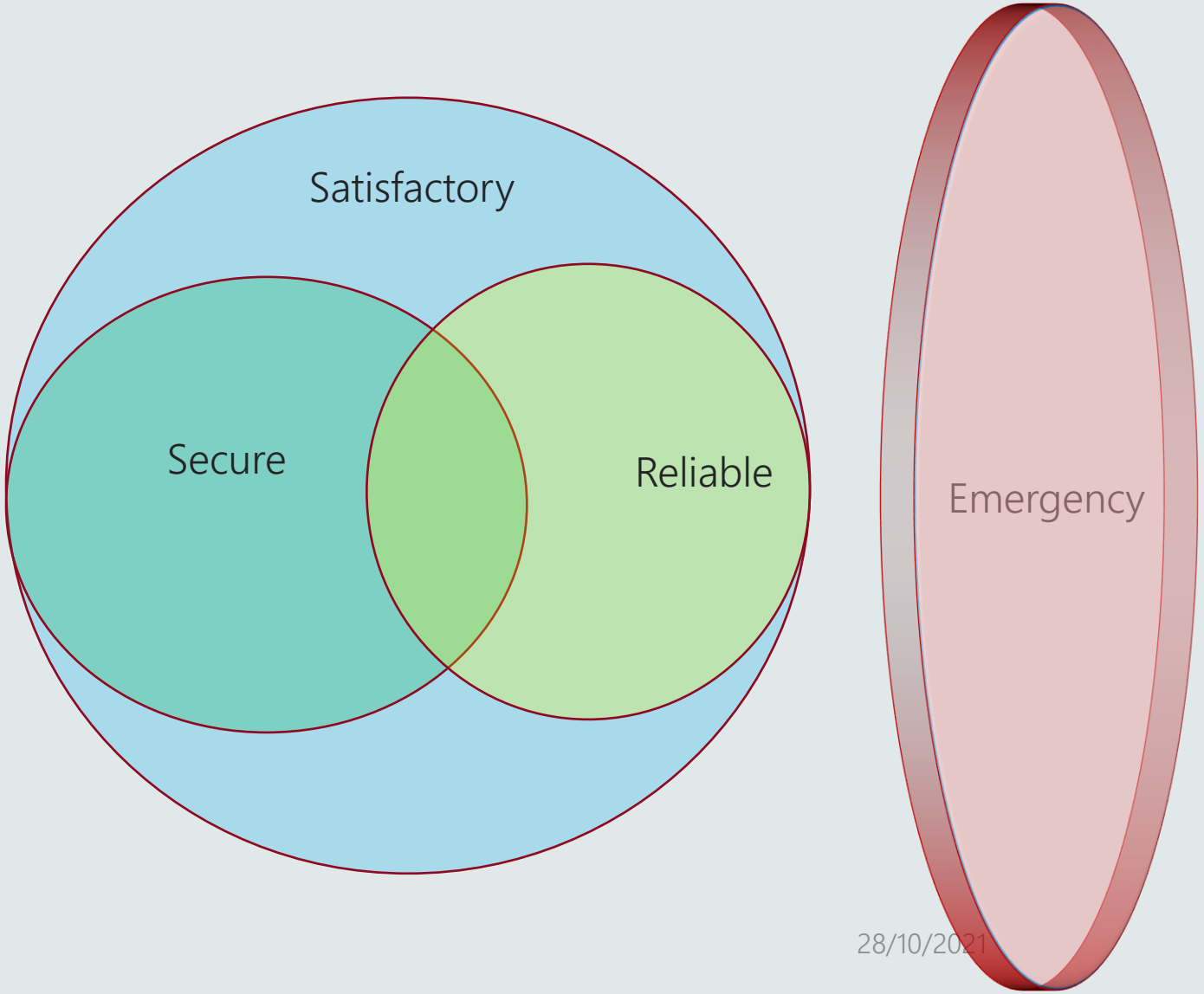
Operating States

Satisfactory = In technical Envelope

Secure = Stay satisfactory after next credible contingency

Reliable = Not manual load shedding (or anticipating)

Emergency = Require actions that otherwise may not be available to return to a satisfactory state



States and Examples

States	Example
Secure, Reliable and Satisfactory ('usual')	Everything in limits now, and will remain in limits following the next credible contingency
Secure, Satisfactory but not reliable (manual load shedding to keep secure)	A transmission line would otherwise be overloaded for the next credible contingency, but we have manually shed load to avoid this
Reliable and Satisfactory but not Secure	A transmission line would otherwise be overloaded for the next credible contingency, we can manually shed load to avoid this but it is going to take longer than the allowable 30 minutes
Reliable and Satisfactory, but not Secure and in an Emergency Operating State	A transmission line would otherwise be overloaded for the next credible contingency, we can manually shed load to avoid this but it is going to take longer than the allowable 30 minutes, and there is a gas fuel shortage for the SWIS
Reliable and not Satisfactory or Secure, and in an Emergency Operating State	A transmission line is actively overloading as a result of multiple concurrent unplanned outages resulting from an out of control bushfire, but no manual load shedding has yet been initiated
Satisfactory, not Secure, not Reliable and in an Emergency Operating State	A transmission line would otherwise be overloaded for the next credible contingency, we have manually shed load to minimise the overload but there is insufficient sheddable load to completely avoid this
Emergency Operating State, not Reliable, Not Secure, Not Satisfactory	A transmission line is actively overloading as a result of multiple concurrent unplanned outages resulting from an out of control bushfire, and manual load shedding has been initiated to minimise the overloads

Principles

General Principle: An EOS is required to allow actions (that otherwise may not be available) that AEMO considers may be necessary to maintain the safe operation of the power system

- EOS declaration is primarily reactive: allow AEMO to specify events that will justify triggering an EOS if they occur
  - usually only once an impact on the power system is observed;
  - some minor exceptions where the impact is forecast rather than actual
- EOS relates to Power System Operations only, a disruption to the operation of the Market or Market Systems, by itself, will not constitute an EOS.
- AEMO to inform the market as soon as practicable (WEM Rule 7.11.3)

Which Conditions cause EOS?

Condition	Definition / Examples	Possible actions enabled by EOS
System Black	• Significant Portion of the SWIS is de-energised *note De-energised islanded portions of the SWIS (e.g. Eastern Goldfields, North Country) is NOT an EOS	• System Restart Plan executed • generator placed in Isoch • directions to Participants • Out of Merit Dispatch
Loss of Control and/or Visibility of Power System	• AEMO Control Room Evacuation • Loss of AEMO EMS (including comms/data failure) • Total loss of SCADA to participants	• delegation of Frequency Control & Power System Security • generator placed in Isoch • directions to Participants • out of Merit Dispatch
Insufficient Generation Adequacy	• Actual generation capacity shortfall; or • Forecast shortfall	• manual load shedding or participant (load) directions • registered, non-reserve capacity participant direction (e.g. Mungarra, West Kalgoorlie)
Insufficient Load to Maintain System Stability	• Actual load is below minimum threshold • Forecast load is below threshold	• directions to participants to increase load • directions to participants to decrease behind the fence generation
Significant shortfall of ESS for extended period	• Lack of Regulation Service • Lack of Contingency Service	• Directions to participants to provide service • Directions to reduce contingency size

Other Conditions that may cause EOS?

- Depending on the outcomes, other triggers may be met by -
  - Fuel Supply Disruption
  - Terrorist Attack
  - IT incident impacting Power System or Market Operation
  - Significant involuntary load interruption is occurring (UFLS)

And Finally

- Any other circumstance which would, in AEMO's reasonable opinion, significantly threaten Power System Security or Power System Reliability.
- That requires additional powers to manage

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