

# WEM Reform Program

## Limit Advice Requirements

WRIG – 1 October 2020

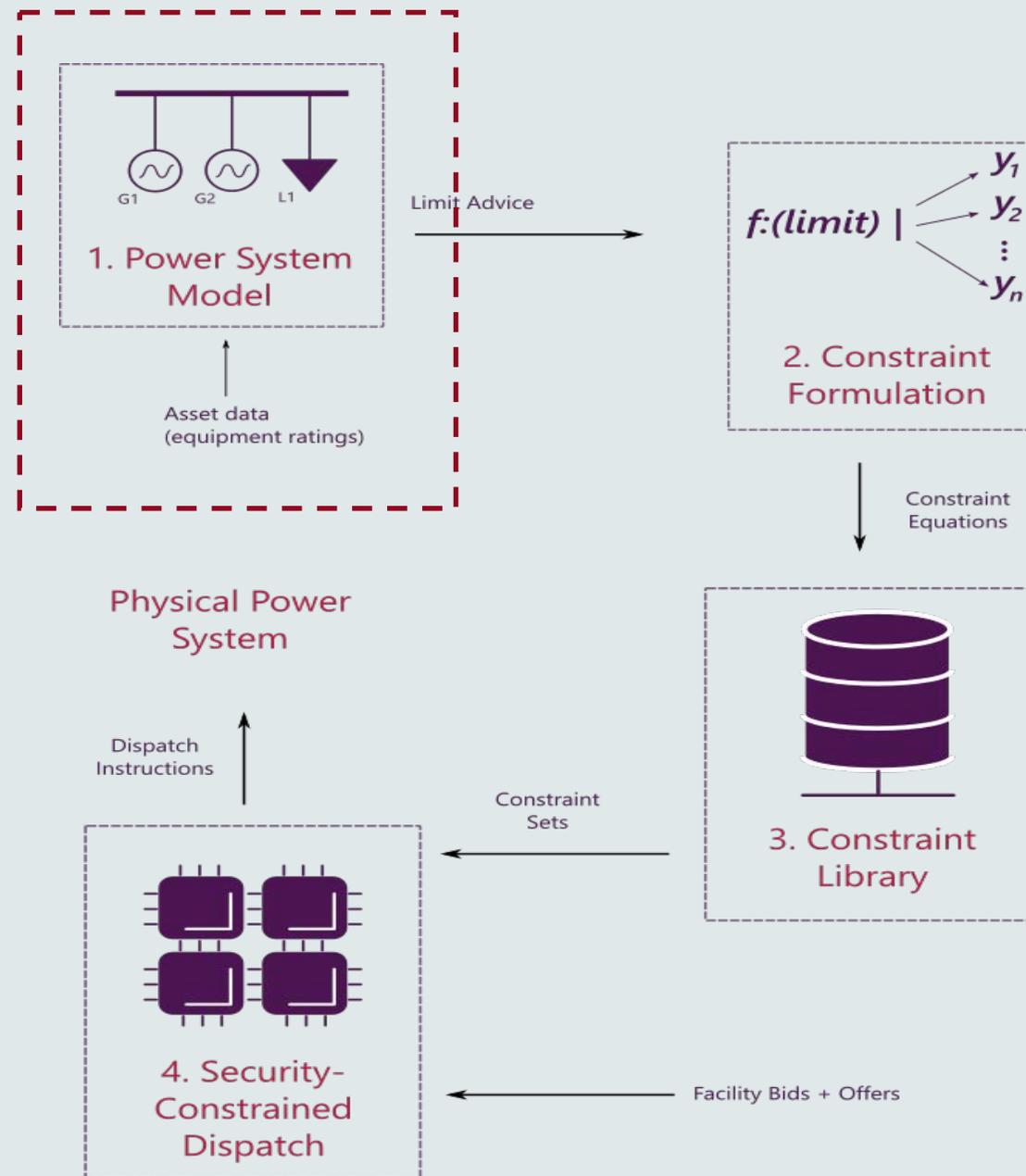
# Agenda

1. Limit Advice Overview
2. Limit Advice Requirements:
  - Overview
  - Thermal Limit Advice
    - Format, form, manner and timeframe
  - Non-Thermal Limit Advice
    - Format, form, manner and timeframe
    - Review
  - General requirements
    - Publication
    - General review & request for updated Limit Advice
    - Retirement

# Limit Advice Overview

# Limit Advice

## Overview



WEM Rules 2.27A.2:

Information to be provided to AEMO by a Network Operator in respect to limitations of, or relating to, its Network (“Limit Advice”) includes:

- (a) Limit Equations in respect of Network Limits, excluding Limit Equations for Essential System Services or, if, in respect of a particular Network element, a mathematical expression is not appropriate, the Network Limit for that particular Network element;
- (b) Limit Advice Inputs;
- (c) Supporting information and data specified in WEM Procedure referred to in clause 2.27A.10 (A).

# Limit Advice Requirements

# Limit Advice Requirements

## Overview

- WEM Rules 2.27A.10 (a)
  - WEM Procedure to specify
    - Information & data to be provided to AEMO in relation to Limit Advice
    - Processes to be followed
      - Format
      - Form
      - Manner
      - Timeframe
- Two forms of Limit Advice:
  - Thermal Limit Advice
    - Thermal Network Limits
    - Examples: transmission line thermal limits
  - Non-Thermal Limit Advice
    - Non-thermal Network Limits
    - Examples: Voltage stability, transient stability
- NOTE 1: Tranche 1B will have the definitions of Thermal Network Limits and Non-thermal Network Limits
- NOTE 2: RCM requirements not included in this requirement. To be included later.

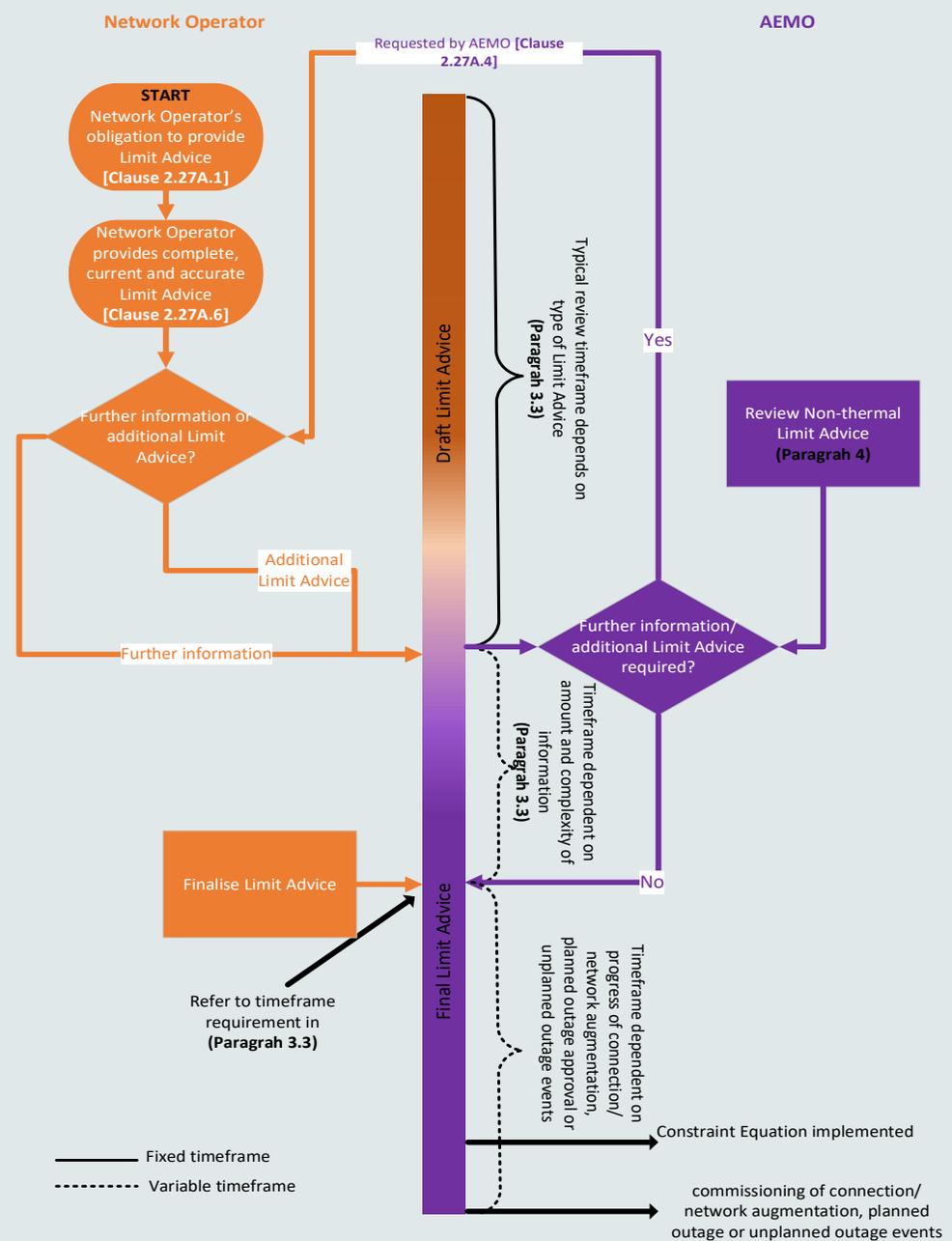
# Limit Advice Requirements

## Thermal Limit Advice

- Thermal Network Limits = Equipment thermal limits
- Background
  - Presently provided to support real-time contingency monitoring in AEMO's EMS
- Format, form and manner
  - Utilising existing processes
  - A list of SWIS equipment thermal limits provided to an agreed shared location
- Timeframe
  - As soon as practicable when no longer complete, current or accurate
  - New equipment: must be provided 3 months prior to commissioning

# Limit Advice Requirements

## Non-thermal Limit Advice: Overview



# Limit Advice Requirements

## Non-thermal Limit Advice: Format, form and manner

- Format, form and manner
  - Non-thermal Limit Equations
  - Non-thermal Limit Advice Inputs, supporting information and data

### 3.2 Format

3.2.1 A Network Operator must provide a non-thermal Limit Advice in the following format:

- (a) a non-thermal Limit Equation must be a mathematical equation or a constant;
  - (b) relevant graphs and tables must be provided as supporting information and data;
  - (c) a non-thermal Limit Equation must be only for a single non-thermal Network Limit type;
  - (d) the non-thermal Network Limit type must be clearly stated;
  - (e) where in relation to existing equipment, a Limit Advice must only contain constraints and other terms that are readily available via SCADA (that is, it must not reference points in the Network where there is no SCADA visibility);
  - (f) the non-thermal Limit Equation must be expressed as a linear combination of Left-Hand Side Terms<sup>1</sup> (refer to the WEM Procedure: Constraint Formulation);
- and it must include as a minimum:
- (f) identification of the relevant SWIS computer model provided in accordance with the WEM Procedure: Network Modelling Data<sup>2</sup>;
  - (g) words identifying whether it is a draft or a final non-thermal Limit Advice in accordance with Figure 1 in this Procedure;
  - (h) if the Limit Advice is an updated non-thermal Limit Advice that is replacing an existing non-thermal Limit Advice, identification of any relevant existing non-thermal Limit Advice that are being replaced;
  - (i) identification of any terms used in a Limit Equation, where they are in relation to new equipment and SCADA is not readily available, and indication when they will be available by;
  - (j) clear definitions for all terms in the non-thermal Limit Equation. For example, what constitutes 'Eastern Goldfield Export';
  - (k) a description of the contingency(s), types of fault and relevant protection fault clearance times where the non-thermal Network Limit applies;
  - (l) specific conditions of the Network, including dispatch of specific Facilities, during which the non-thermal Network Limit applies in accordance with WEM Procedure: Power System Security;
  - (m) specific Network conditions whereby NRS and control schemes apply;
  - (n) applicable NRS and control schemes, including detail of the schemes such as monitored elements, available SCADA information, thresholds of activation of the scheme, and actions following the activation ; and the impact on the non-thermal Limit Advice where these schemes are out of service;
  - (o) if applicable, specific timeframe during which the non-thermal Network Limit applies;
  - (p) equipment or areas of the SWIS where the non-thermal Network Limit applies in accordance with WEM Procedure: Power System Security;

# Limit Advice Requirements

## Non-thermal Limit Advice: Timeframe

Typical lead time	Cause of non-thermal Limit Advice requirement	Circumstances of provision of non-thermal Limit Advice	Maximum Business Days to complete (from the start of review)	Timeframe of requirement for non-thermal Limit Advice to be finalised
A year or more in advance	Significant change to SWIS under normal operation, due to network augmentation or reinforcement	After Network augmentation/ reinforcement has been approved for detailed design  And, typically, 6 months prior to commissioning of new equipment	30 days	Typically at least 3 months prior to commissioning of new equipment
	Significant change to SWIS under normal operation, due to new connections	After Detailed Planning Data in relation to relevant connection details becomes available to the Network Operator,  And, typically, 6 months prior to commissioning of new connection	30 days	Typically, at least 3 months prior to commissioning of new connection
Months and up to a year in advance	Single Outage	As soon as practically possible after a Network Operator forms a view that a non-thermal Limit Advice is required for Outages, and typically 4 months prior to finalisation of the Limit Advice	20 days	If a Network Operator forms a view that non-thermal Limit Advice is required for Outages, non-thermal Limit Advice should be provided to AEMO for finalisation as soon as practically possible.  Where in relation to Planned Outages, prior to approval of an Outage and typically 2 months prior to commencement of the Outage.
	Multiple Outages		20 days, and additional 2 days per Network Limit	
	Planned minor change to SWIS under normal operation	Typically, 3 months prior to proposed changes	Up to 20 days	Typically 1 month prior to the approval of the change to the SWIS
Immediate and up to 1 day in advance	Unforeseen events	As required and best endeavours	As required and best endeavours	Immediate and best endeavours

<sup>111</sup> Examples of significant change to SWIS under normal operation include: a new generation or load connection, Network augmentations, and new Network equipment having significant impact on system normal operation.

<sup>112</sup> Detailed Planning Data has the meaning given in Attachment 3 of Technical Rules.

<sup>113</sup> Note that Constraint Equations for the power system under Outage conditions are typically implemented in advance and must be ready to be invoked when Outages take place. Therefore, relevant non-thermal Limit Advice must be provided as soon as practically possible, whenever a Network Operator forms a view that an updated or a new non-thermal Limit Advice is required.

<sup>114</sup> Examples of minor changes to the SWIS under normal operation include: change of normally open or closed points, and change of switching philosophy of Network equipment.

<sup>115</sup> Examples of unforeseen events include multiple and non-credible contingencies due to bushfire or storms determined and re-classified by AEMO as Credible Contingencies in accordance with clause 3.8A.5 of the WEM Rules.

# Limit Advice Requirements

## Non-thermal Limit Advice: Review

- To support formulation of constraint equations
  - WEM Market Objectives
  - Good electricity industry practice
- AEMO is not required to
  - Review methodology & assumptions
  - Recalculate/modify Limit equations
- To identify residual risks and unnecessary consequences:
  - Failing to maintain Power System Security or Power System Reliability
  - Overly conservative such that inconsistent with WEM Market Objectives
  - Unintended impact on power systems
- To inform AEMO's request for clarification, additional information and Limit Advice [2.27A.4]

# Limit Advice Requirements

## General requirements

- Publication
  - Public information
    - When thermal Limit Advice is received
    - When non-thermal Limit Advice is finalised
- General review of Constraint Equations & request for additional/updated Limit Advice
- Retirement
  - As specified by NO to be obsolete

# Questions

- Additional comments or questions can be provided to AEMO
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  - AEMO Contact – Josephine Nga