



Proposed Technical Rules Changes

Presented by
Tom Percy



Technical Rules Implementation

- Comments are on the current proposal only.
- The rules have been discussed at the Technical Rules committee
- These changes to the Rules are **not approved**.

User Exemptions

1.9.1

- Network Service provider must consult with IMO and/or System Management before granting an exemption

Voltage Step Limits

2.2.2

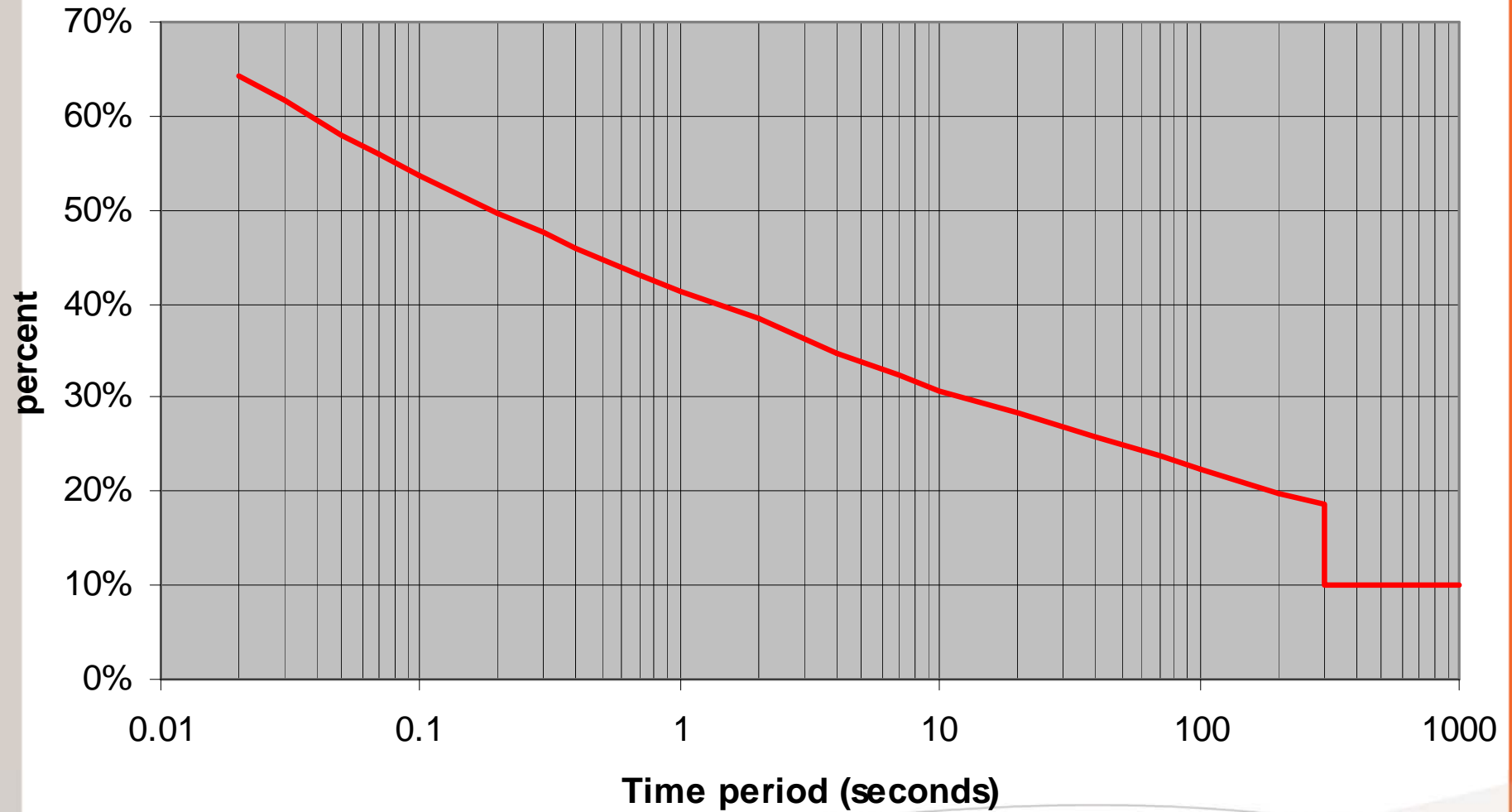
- Updated to be consistent with AS61000.3.7
- Infrequent switching limits remain unchanged
- Routing switching limits dependant upon frequency of switching

Table 2.2 – Step Change voltage limits

Cause	Pre- <u>switching tap-changing</u> (quasi steady-state) <u>and</u> <u>during tap-changing</u>		Post- <u>switching tap-changing</u> (final steady state)		
			<u>Transmission</u>	<u>Distribution</u>	
Routine Switching ⁽¹⁾	<u>r</u> <u>(hour⁻¹)</u>	<u>$U_{dvn}^{(3)}/U_N^{(4)}$</u> <u>(%)</u>		<i>Transmission voltages must be between 110% and 90% of nominal voltage</i>	Must attain previous set point
		<u>Distribution</u>	<u>Transmission</u>		
	<u>$r < 1$</u>	<u>±4.0%</u>	<u>±3.0%</u>		
	<u>$1 < r < 10$</u>	<u>±3.0%</u>	<u>±2.5%</u>		
	<u>$10 < r < 100$</u>	<u>±2.0%</u>	<u>±1.5%</u>		
<u>$100 < r < 1000$</u>	<u>±1.25%</u>	<u>±1.0%</u>			
Infrequent Switching ⁽²⁾	+6%, -10%		<i>Transmission voltages must be between 110% and 90% of nominal voltage</i>	Must attain previous set point	

Percentage overvoltage

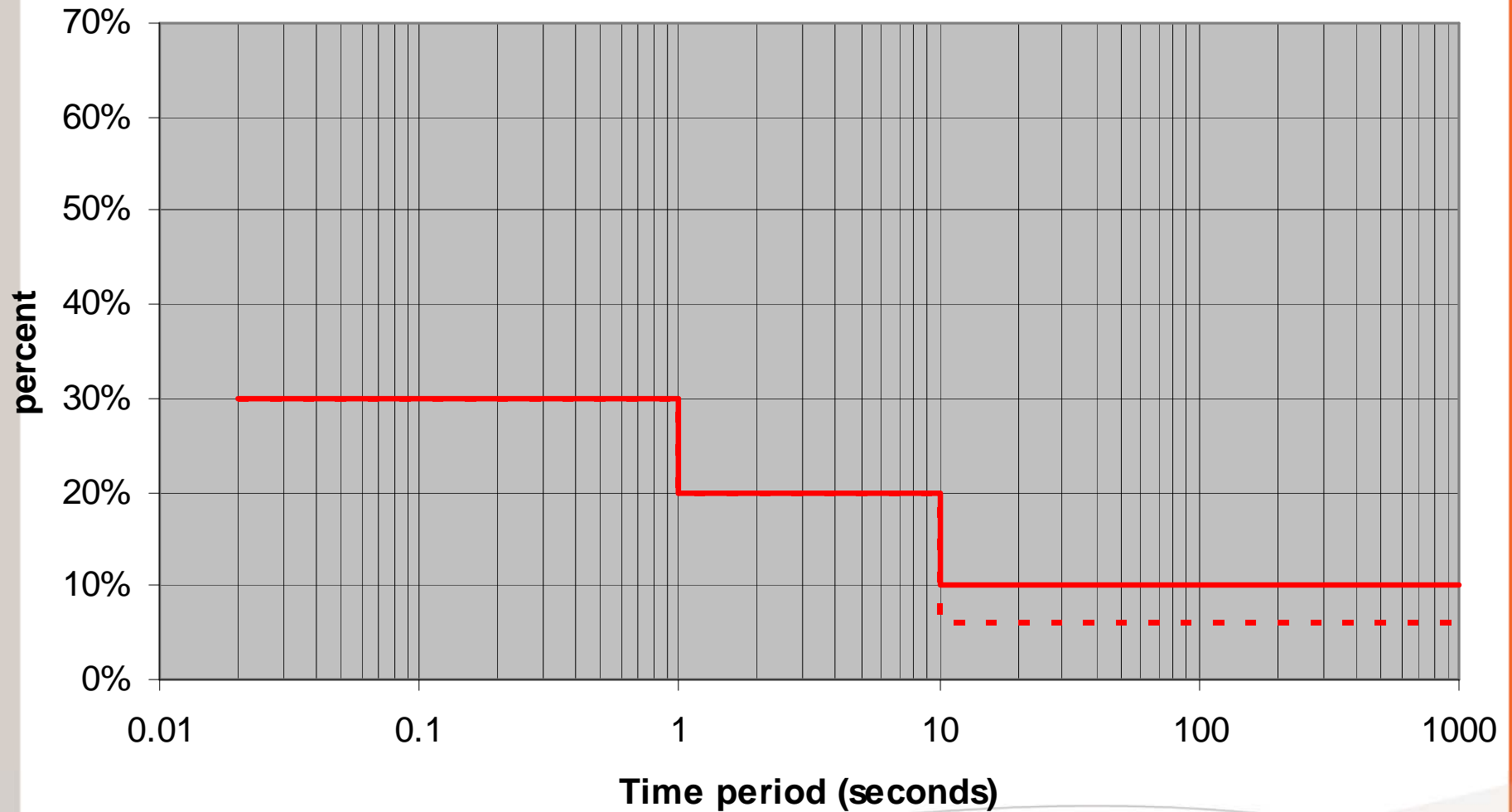
Percentage overvoltage



— Transmission

Percentage overvoltage

Percentage overvoltage



— Transmission - - - Distribution

Percentage Overvoltage

3.2.1 (a)

Users proposing to connect equipment that is intolerant of high *connection point voltage* may request the *Network Service Provider* to undertake a study to determine the maximum potential *overvoltage* at the proposed *connection point*. The cost of such a study will be the responsibility of the *User* requesting it.

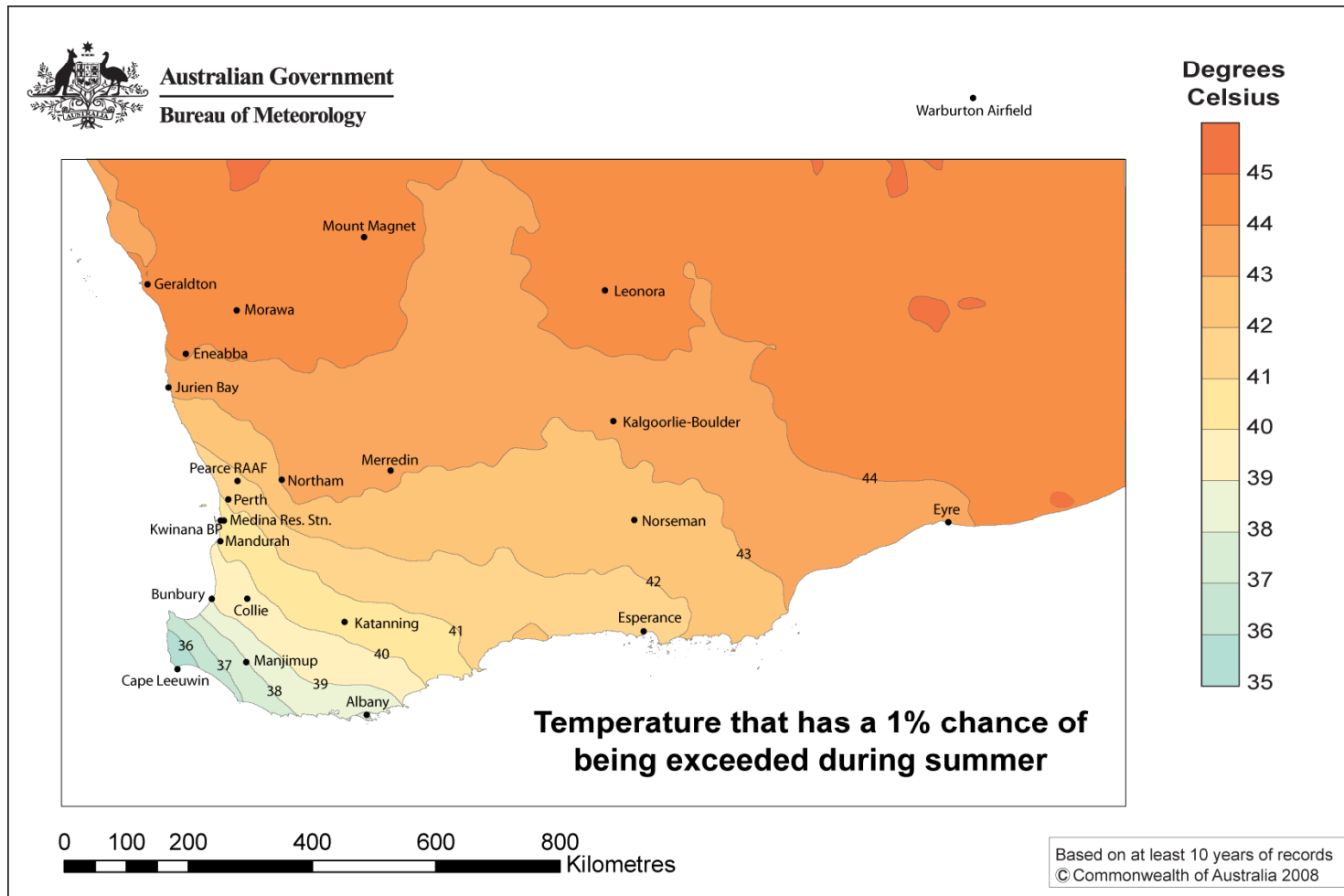
Negative sequence voltage

3.2.1 (d)

- Measurement of negative sequence voltage is now 10 minute averages rather than 30 minute
- Transmission connected customers must be connected to all three phases.

Reactive Power Capability

3.3.3.1 (a)



Reactive Power Capability

3.3.3.1 (b)

- Requirement for continuous varying reactive power without reliance on mechanically switched devices.

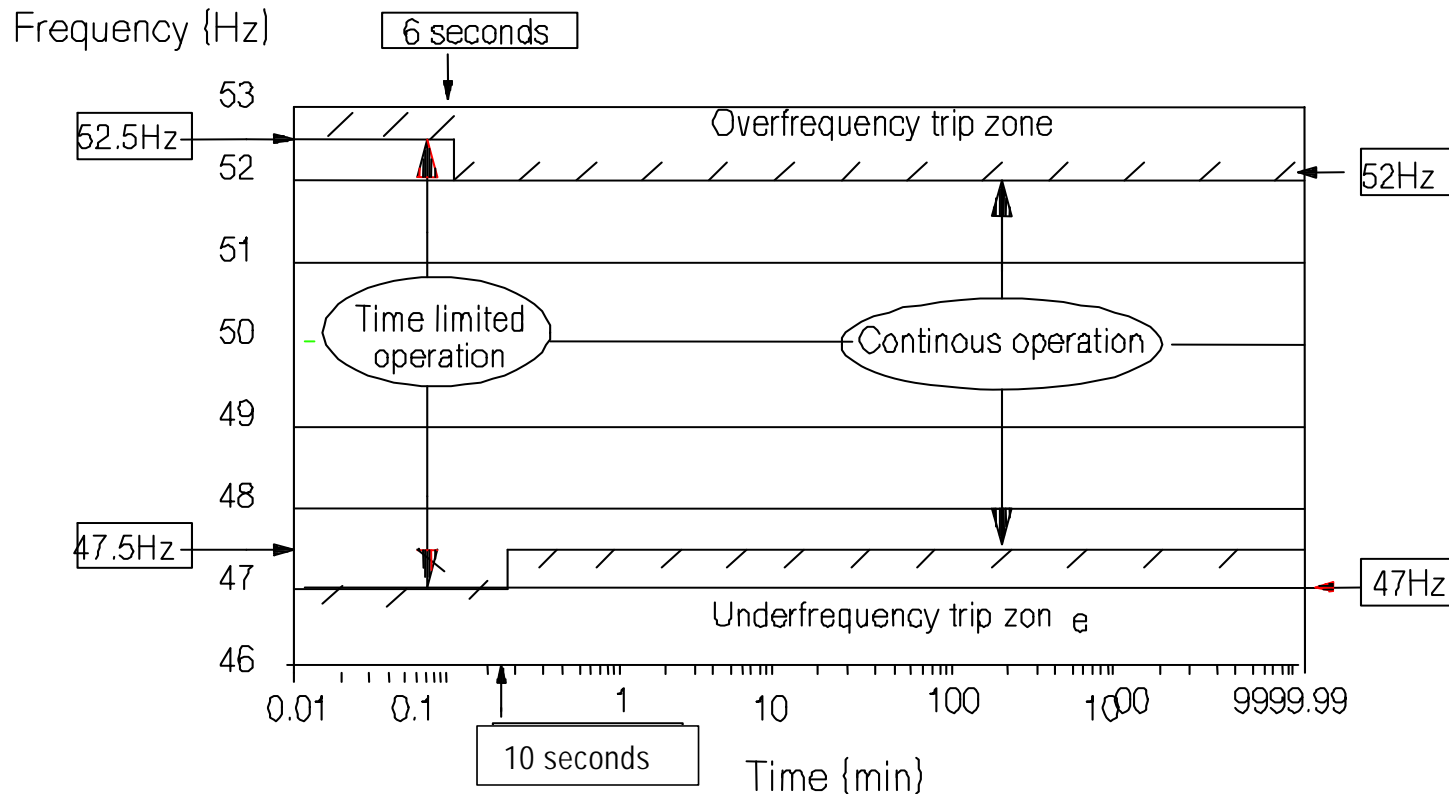
Reactive Power

3.3.3.1 (e, f, g)

- Reactive power can be provided by devices other than the generator
- Reactive power control must be coordinated between all sources of reactive power
- Reactive power output can be reduced for lower voltages but the current must be maintained at rating.
- A capital contribution can be used to offset reactive requirements

Frequency Excursions

3.3.3.3 (b)



The requirements provide a safety margin relative to the frequency operating standards of Table 2.1, within which a *Generator* may apply for an exemption from compliance from these *Rules*.

Post fault reactive power

3.3.3.3 (f)

- Explanatory note added

This requirement is intended for undervoltage situations where a generator is potentially exacerbating the problem.

Rate of Response

3.3.4.4 (f)

- Response requirements explicitly defined for wind and solar.
- 90% of response within 2 seconds
- A reduction in output is required for frequency increase.
- Increase in output for frequency decline is not required for non synchronous generating units.

Ramping rates

3.3.4.4(b)

A *power station* that is not subject to dispatch by *System Management* must not increase or decrease its *active power generation* at a rate greater than 10MW per minute or 15% of the *power station's* aggregate *nameplate rating* per minute, whichever is the greater, except when more rapid changes are necessary due to the strength of the energy source moving outside the *power station's* design range.

Control System

3.3.4.5

Changed from:

Each *Generator* must therefore provide sufficient *reactive power* injection into, or absorption from, the *transmission or distribution system* to meet the *reactive power* requirements of its *loads*, plus all *reactive power* losses required to deliver its real power output at system *voltages* within the ranges specified in the relevant *connection agreement* for normal operation and contingency conditions.

Control System

3.3.4.5

To:

The overriding objective of a *generating unit's voltage control system* is to maintain the specified *voltage* range at the *connection point*.

Control System

3.3.4.5

Measured at the point of control, the *generating unit* must be capable of producing an output change of not less than 100% of its *reactive power generation* capability for a sustained 0.5% error between the *voltage* reference and the sensed *voltage*

Small Generators

3.6.3 (a)

- Clarified that additional data may be required.

3.6.5

- Non synchronous generators can use power factor control unless system studies show a requirement for voltage control.

3.6.8

- Voltage change 2% limit changed where the generator is contracted to provide voltage control services.

Small Generators

3.6.10 Protection

- Clarification to protection requirements. Only for system security and not to protect generator's facility.

3.6.10.1 (g)

- The earth fault protection scheme may be residual earth fault or neutral voltage displacement **depending on the earthing arrangement.**

3.6.10.3 Small Generators – Islanding Protection

(c)

- For power stations rated >1 MVA
Physically separate relays are required for each islanding protection.
- (d)
- For power stations rated < 1 MVA
islanding protections can be in the same relay provided the overcurrent relay is physically separate.

Small Generators

- 3.6.12
- Failure of generator protection must trip the generator main switch except:
 - Where the protection system comprises two fully independent protection schemes of different principle.
 - This will require suitable alarms and action.

Technical Rules Implementation

- These changes to the Rules are **not approved**.
- Approval has been delayed due to concerns over PV systems.