

DISTRIBUTION CODE MODIFICATION PROPOSAL FORM

Modification Proposal submitted By: Paul O'Halloran	DATE OF SUBMISSION OF PROPOSAL: 17 th December 2014	Modification Proposal Number: <i>(to be assigned by Review Panel Secretary)</i> #32
CONTACT DETAILS FOR MODIFICATION PROPOSAL ORIGINATOR: (IF NOT DISTRIBUTION CODE REVIEW PANEL		
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MODIFICATION PROPOSAL TITLE:	WFPS Voltage Regulation	
DISTRIBUTION CODE SECTION(S) AFFECTED BY PROPOSAL <ol style="list-style-type: none">1. DCC11.5.2.32. Glossary		
MODIFICATION PROPOSAL DESCRIPTION <i>(Clearly state the desired amendment and all text changes. Attach further information if necessary)</i> <ol style="list-style-type: none">1. Replace the current content of DCC11.5.2.3 with the material shown in Appendix 12. Insert new definition per Appendix 2		
MODIFICATION PROPOSAL JUSTIFICATION <i>(Clearly state the reason for the modification. Attach further information if necessary)</i> <p>This modification aims to clarify the Voltage Regulation requirements for WFPS outlined in DCC11.5.2.3. The modification introduces a requirement for the reactive power response to be zero at reference voltage. This ensures that the voltage regulation slope passes through zero. This is the intent of this clause but at present it is not explicitly stated.</p> <p>In addition to this, the definition for voltage regulation slope setting is added such that it is the slope of the line required to move from maximum reactive power absorption to maximum production as defined by the capability diagram in Figure 13. This aims to clarify that the slope is fixed and does not vary with wind conditions. It should be noted that a WFPS should continue on this slope if it has a reactive power capability in excess of the Distribution Code requirements.</p> <p>This modification aims to clarify the Voltage Regulation requirements for WFPS outlined in DCC11.5.2.3. The modification introduces a requirement for the WFPS to implement the required reactive power control mode within 20 seconds of receipt of the appropriate signal. This is the intent of this clause but at present it is not explicitly stated.</p>		
IMPLICATIONS OF NOT IMPLEMENTING THIS MODIFICATION <p>The intent of the clause is for the voltage regulation slope to pass through zero ensuring that the reactive response to be zero at reference voltage. For this reason the modification will provide clarity to Users on this requirement. Omitting this line may cause ambiguity.</p> <p>Similarly, the addition of the definition of voltage regulation slope setting is to ensure that a fixed slope is defined between maximum and minimum reactive power capability as defined in the Distribution Code.</p>		

The intent of the clause is for the WFPS to implement the required reactive power control mode within 20 seconds of receipt of the appropriate signal. For this reason the modification will provide clarity to Users on this requirement. Omitting this line may cause ambiguity.

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Appendix 1: DCC11.5.2.3

DCC11.5.2.3 Voltage Control

For **DSO** type A **Controllable WFPS's** irrespective of **Registered Capacity** and **DSO** type B **Controllable WFPS's** with **Registered Capacity** $\geq 5\text{MW}$, under steady state conditions, the **Voltage Regulation System** shall be capable of implementing the following **Reactive Power** control modes which shall be available to the **DSO** or **TSO** as agreed by **DSO** and **TSO**:

- a) The **Controllable WFPS** shall be capable of receiving a power factor control (PF) set-point to maintain the power factor set-point at the **Connection Point**;
- b) The **Controllable WFPS** shall be capable of receiving a **Reactive Power Control (Q)** set-point to maintain the **Reactive Power** set-point at the **Connection Point**;
- c) The **Controllable WFPS** shall be capable of receiving a **Voltage Regulation (kV)** set-point for the voltage at the **Connection Point**. The **Voltage Regulation System** shall act to regulate the voltage at this point by continuous modulation of the **Controllable WFPS's Reactive Power** output, without violating the voltage Step Emissions limits as set out in the **IEC** standard 61000-3-7:1996 Assessment of Emission limits for fluctuating loads in **MV** and **HV** power systems. **The Controllable WFPS's Reactive Power** output shall be zero when the voltage at the **Connection Point** is equal to the **Voltage Regulation Set-point**.
- d) A change to the power factor control (PF) set-point, **Reactive Power** control (Q) set-point, ~~or~~ **Voltage Regulation (kV)** set-point **or** **Reactive Power** control mode shall be implemented by the **Controllable WFPS** within 20 seconds of receipt of the appropriate signal, within its **Reactive Power** capability range as specified in **DCC11.4.5**

Appendix 2: Glossary

Voltage Regulation System Slope Setting

The percentage change in **Distribution System** voltage that would cause the **Reactive Power** output of the **Controllable WFPS** to vary from maximum **MVar** production capability of Q/Pmax of 0.33 to maximum **MVar** absorption capability of Q/Pmax of -0.33 or vice-versa, as per Figure 13.