

# DISTRIBUTION CODE MODIFICATION PROPOSAL FORM

<b>Modification Proposal submitted By:</b>	<b>DATE OF SUBMISSION OF PROPOSAL:</b>	<b>Modification Proposal Number:</b> <i>(to be assigned by Review Panel Secretary)</i>
Stephen Walsh	27 <sup>th</sup> August 2013	# 26
<b>CONTACT DETAILS FOR MODIFICATION PROPOSAL ORIGINATOR: (IF NOT DISTRIBUTION CODE REVIEW PANEL)</b>		
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<b>MODIFICATION PROPOSAL TITLE:</b>	Rate of Change of Frequency Requirements for Users	
<b>DISTRIBUTION CODE SECTION(S) AFFECTED BY PROPOSAL</b>		
<ol style="list-style-type: none"> <li>1. DCC 9.9.7.1 i</li> <li>2. DCC 10.10.1.1 d</li> <li>3. DCC 11.3.1 d</li> <li>4. DCC 11.3.1 b</li> <li>5. DCC 11.3.1 Table 6</li> <li>6. Glossary – new definition of Rate of Change of Frequency</li> </ol>		
<b>MODIFICATION PROPOSAL DESCRIPTION</b> <i>(Clearly state the desired amendment and all text changes. Attach further information if necessary)</i>		
<p>Replace the existing capability limit for Rate of Change of Frequency from 0.5 Hz/s up to 1.0 Hz/s. The modification will also provide some information on how this value is measured, the proposal is to use a rolling average value over 500ms. The rate of change of frequency will be a plus or a minus value depending on whether generation or demand has been disconnected in the fault.</p> <p>Whereas Users must have this capability there will be case where the DSO will set protection relays to a lower or higher value. The text of the modifications are listed in Appendix 1;</p> <p>Table 6 in DCC 11.3.1 which refers to the existing protection settings will be removed .</p> <p>This modification also proposes a Glossary definition for Rate of Change of Frequency.</p>		
<b>MODIFICATION PROPOSAL JUSTIFICATION</b> <i>(Clearly state the reason for the modification. Attach further information if necessary)</i>		
<p>The purpose of this modification is to ensure that Users of the Distribution System have the capability to stay connected during system events where the Rate of Change of Frequency is up to a new higher level. This will facilitate having greater amounts of wind generation on the Network. Generally wind generators have a very low inertia. During a system event the Rate of Change of Frequency depends on the size of MWs lost divided by the system inertia. So with a lot of wind generators on the system the loss of a large system infeed/outfeed will create a higher Rate of Change of Frequency. To avoid cascade tripping Users must stay connected during such an event.</p> <p>The purpose of removing Table 6 is to avoid confusion in referring to a protection setting which may be below 1 Hz/s.</p> <p>The purpose of the Glossary definition is to provide a reference to what is now a frequently used term.</p>		

**IMPLICATIONS OF NOT IMPLEMENTING THIS MODIFICATION**

The implication of not having Distribution Users compliant is that there will be limits on the amount of wind generation to prevent cascade tripping following system events. Alternatively expensive constraints will have to be incurred keeping high inertia units running to prevent RoCoF events greater than the current limit of 0.5 Hz/s.

**PLEASE SUBMIT MODIFICATION PROPOSALS TO THE PANEL SECRETARY BY E-MAIL TO: [DistCodePanel@mail.esb.ie](mailto:DistCodePanel@mail.esb.ie)**

## Appendix 1: Text of changes to the Code.

### Existing text;

**DCC9.9.7.1** Each Demand Side Unit shall, as a minimum, have the following capabilities:

- (i) remain synchronised to the Distribution System during a rate of change of Frequency of values up to and including 0.5 Hz per second;

### Proposed text;

**DCC9.9.7.1** Each Demand Side Unit shall, as a minimum, have the following capabilities:

- (i) remain synchronised to the Distribution System during a rate of change of Frequency of values up to and including plus or minus 1.0 Hz per second measured as a rolling average over 500ms. Voltage dips may cause localised Rate of Change of Frequency values in excess of 1 Hz per second for short periods, and in these cases, the Demand Side Unit shall remain synchronised during Voltage dips at the HV terminals of 95% of nominal Voltage (5% retained) for a duration of 0.6 seconds; The DSO may require lower or higher values to be used for protection settings;

### Existing text;

**DCC10.10.1.1** Each Generation Unit shall, as a minimum, have the following capabilities:

- (d) Remain synchronised to the Distribution System during a rate of change of the Distribution System Frequency of values up to and including 0.5Hz per second.;

### Proposed text;

**DCC10.10.1.1** Each Generation Unit shall, as a minimum, have the following capabilities:

- (d) Remain synchronised to the Distribution System during a rate of change of Frequency of values up to and including plus or minus 1.0 Hz per second measured as a rolling average over 500ms. Voltage dips may cause localised Rate of Change of Frequency values in excess of 1 Hz per second for short periods, and in these cases, the clause DCC.10.10.1.1(h) supersedes this clause (DCC.10.10.1.1(d)). The DSO may require lower or higher values to be used for protection settings;

### Existing text;

**DCC11.3.1** Wind Farm Power Stations shall have the capability to;

- (d) remain connected to the Distribution System during rate of change of Frequency of values up to and including 0.5 Hz per second.

### Proposed text;

**DCC11.3.1** Wind Farm Power Stations shall have the capability to;

- (d) remain connected to the Distribution System during rate of change of Frequency of values up to and including plus or minus 1.0 Hz per second measured as a rolling average over 500ms. Voltage dips may cause localised Rate of Change of Frequency values in excess of 1 Hz per second for short periods, and in these cases, the clause DCC.11.2 supersedes this clause (DCC.11.3.1(d)). The DSO may require lower or higher values to be used for protection settings.

Existing text;

**DCC11.3.1** Wind Farm Power Stations shall have the capability to;

- (b) remain connected to the Distribution System at Frequencies within the range 47.5 Hz to 52 Hz for a duration of 60 minutes. Note that setting of the G10 Generator Interface Protection will determine actual operation in this range (see Table 6).

Proposed text;

**DCC11.3.1** Wind Farm Power Stations shall have the capability to;

- (b) remain connected to the Distribution System at Frequencies within the range 47.5 Hz to 52 Hz for a duration of 60 minutes. Note that setting of the Generator Interface Protection will determine actual operation in this range.

Existing text;

After DCC 11.3.1 d

Protection Function	Frequency Setting	Time Setting
Over Frequency	50.8Hz	0.5s
Under Frequency	47Hz	0.5s
Rate-of-change-of-Frequency	0.55Hz/s	< 0.5s
Under-voltage	80% of nominal	1s

**Table 6: Currently applicable Generator Interface Protection settings**

Proposed text;

None (i.e. there will be no table 6 or alternative table)

Proposed New Glossary Definition

<b>Rate of Change of Frequency</b>	The rate of increase or decrease of Frequency as measured at the User's Connection Point over the time period as set out in DCC10.10.1.1 (d)
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