

MODIFICATION PROPOSAL FORM

160 SHELBOURNE ROAD
BALLSBRIDGE

DUBLIN 4

PH: +353-1-677 1700

FAX: +353-1-6615375

EMAIL: GRIDCODE@EIRGRID.COM

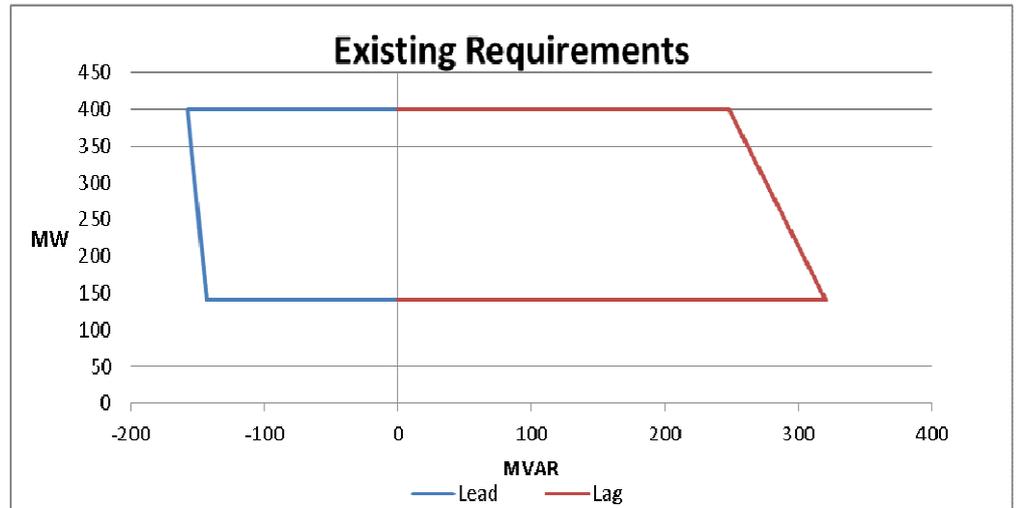
FORM GC1, PROPOSAL OF MODIFICATION TO GRID CODE.

MODIFICATION PROPOSAL ORIGINATOR:	ESB GWM		
MODIFICATION PROPOSAL ORIGINATOR (CONTACT NAME)	Paul Doyle	MODIFICATION PROPOSAL ORIGINATOR FAX NUMBER:	
MODIFICATION PROPOSAL ORIGINATOR TELEPHONE NUMBER:	01-7027613	DATE:	24/10/14
MODIFICATION PROPOSAL ORIGINATOR E-MAIL ADDRESS:	Paul.doyle2@esb.ie	MODIFICATION PROPOSAL NUMBER (EIRGRID USE ONLY)	
GRID CODE SECTION(S) AFFECTED BY PROPOSAL:	CC.7.3.6.1 – Reactive Power Capability		
GRID CODE VERSION :	Version 5		

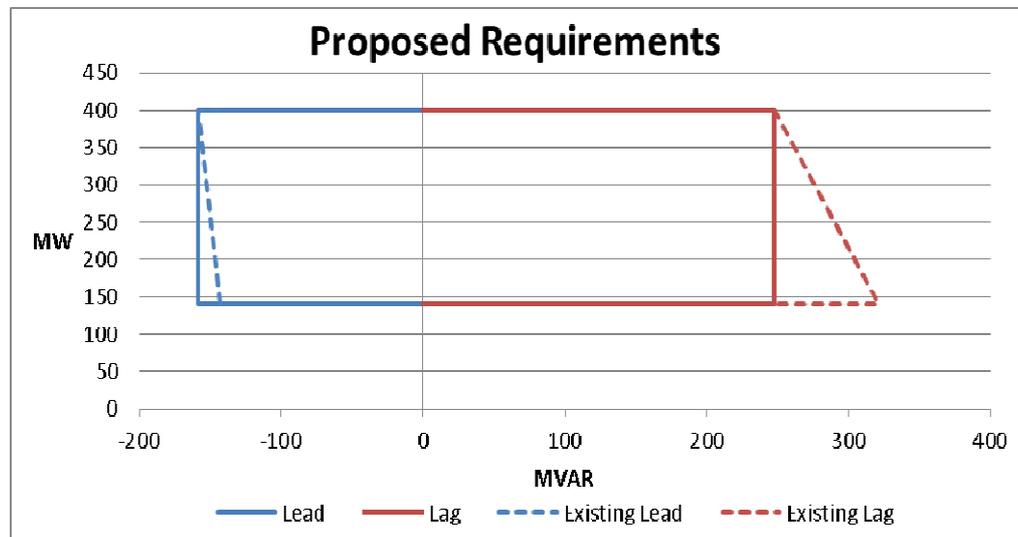
MODIFICATION PROPOSAL DESCRIPTION

(MUST CLEARLY STATE THE DESIRED AMENDMENT, ALL TEXT/FORMULA CHANGES TO THE GRID CODE. THE REQUIRED REASON FOR THE MODIFICATION MUST STATED. ATTACH ANY FURTHER INFORMATION IF NECESSARY.)

The Grid Code currently sets out the reactive power requirements for conventional generators at both Registered Capacity and 35% of Registered Capacity. The requirement at any point in between is indicated by a straight line between the two points. This results in a range of different Mvar requirements in both leading and lagging directions. These requirements can be seen on the attached reactive power requirement chart – “Existing Requirements”.



ESB GWM propose to change the reactive power requirements for conventional plant to have a single Mvar requirement in each direction (leading and lagging). The new requirement would be the same as the existing at registered capacity but now the requirement across all other active power output levels is represented by a straight vertical line down from the requirement at registered capacity. This would result in a reactive power requirement as shown in the “Proposed Requirements” chart.



Proposed requirements are indicated by the solid line, the hashed line is used to display the difference between existing and proposed.

ESB GWM propose this modification for the following reasons:

- 1. The additional lagging reactive power currently required at lower active power outputs cannot be used by the TSO as only a single reactive power declaration can be entered in each Leading and Lagging direction. This misalignment between the Grid Code and the market has been highlighted on numerous occasions by industry. Most recently it was highlighted as part of the DS3 product definitions where both the TSO and the RA's stated that they only want the market to remunerate reactive power which is available across the full active power range i.e. they do not want to facilitate multiple reactive power capabilities depending on active power output. This misalignment between Grid Code and market systems has in the past caused units, whilst being fully compliant, to incur GPI's for reactive power based on the single declaration limit in EDIL.**
- 2. This additional reactive power capability places additional costs on conventional generators including:**
 - a. Increased size and tapping range for Grid transformers**
 - b. Increased generator costs due to higher than standard IEC generator voltages**
 - c. Additional switchgear costs due to increased voltage withstand requirements**
 - d. Increased tapping range for house transformers**
- 3. To align the reactive power requirements for conventional generators with the requirements for both WFPS and Interconnectors. Both of these technologies currently have requirements in line with what is proposed.**
- 4. The modification actually provides the TSO with more leading reactive power from units at low load i.e. a greater technical capability. This is particularly important when attempting to control high voltages on a lightly loaded transmission system.**

CC.7.3.6 Reactive Power capability

CC.7.3.6.1 Each Generation Unit shall have the following Reactive Power capability as measured at their alternator terminals:

Voltage Range	Connected at:	At Registered Capacity between:	At 35% of Registered Capacity between At all other outputs:
99kV ≤ V ≤ 123kV	110kV	0.93 power factor leading to 0.85 power factor lagging	0.7 power factor leading to 0.4 power factor lagging A straight vertical line from the requirement at Registered Capacity
85kV ≤ V < 99kV	110kV	Unity power factor to 0.85 power factor lagging	0.7 power factor leading to 0.4 power factor lagging A straight vertical line from the requirement at Registered Capacity
200kV ≤ V ≤ 245kV	220kV	0.93 power factor leading to 0.85 power factor lagging	0.7 power factor leading to 0.4 power factor lagging A straight vertical line from the requirement at Registered Capacity
190kV ≤ V < 200kV	220kV	Unity power factor to 0.85 power factor lagging	0.7 power factor leading to 0.4 power factor lagging A straight vertical line from the requirement at Registered Capacity
360kV ≤ V ≤ 420kV	400kV	0.93 power factor leading to 0.85 power factor lagging	0.7 power factor leading to 0.4 power factor lagging A straight vertical line from the requirement at Registered Capacity
350kV ≤ V < 360kV	400kV	Unity power factor to 0.85 power factor lagging	0.7 power factor leading to 0.4 power factor lagging A straight vertical line from the requirement at Registered Capacity

<p>IMPLICATION OF NOT IMPLEMENTING THE MODIFICATION</p>	<p>If the modification is not implemented then the reactive power requirements for conventional generators shall remain out of line with the requirements for both WFPS and Interconnectors. This unfairly discriminates against conventional generators.</p> <p>As outlined above this superfluous additional requirement burdens conventional generators with additional costs compared to other generators. Without implementing this modification this unfair and unequal additional cost will remain on conventional generators.</p> <p>Also, unless implemented there will continue to be a misalignment between the technical requirements of the Grid Code and the technical capability which conventional generators can offer (and the TSO can utilise) under the current market structures. This misalignment between the Grid Code and the market has been highlighted on numerous occasions by industry. Most recently it was highlighted as part of the DS3 product definitions where both the TSO and the RA's both stated that the market will only remunerate reactive power which is available across the full active power range.</p> <p>Without implementing this modification the TSO Generator Performance Incentives incorrectly impose a penalty on a unit which is fully compliant.</p>
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Please submit the Modification Proposal by fax, post or electronically, using the information supplied above

<p>EIRGRID REVIEWER</p>	
<p>EIRGRID ASSESSMENT</p>	