

Joint Grid Code Review Panel #2 2021

Welcome to all members

20 July 2021

Agenda

Time	Topic
09:30 – 10:15	<p>Introduction: 10 mins</p> <ol style="list-style-type: none">1. Welcome Members;2. Minutes and Actions from Previous Meeting (go to 23 March 2021). <p>Discussion Item: 20 mins</p> <ol style="list-style-type: none">1. Modification to the minimum aggregation value for AGUs and DSUs.2. Requirements for Offshore PPMs <p>Updates: 10 mins</p> <ol style="list-style-type: none">1. Definition of Registered Capacity Review;2. CRU Update;3. Utility Regulator Update; <p>AOB 5 mins</p>

Modification to the minimum aggregation value for AGUs and DSUs.

Brian Mongan
Director of Commercial and Operations
Powerhouse Generation





**FEDERATION OF
ENERGY RESPONSE
AGGREGATORS**

Grid Code Modification

Removal of Demand Side and Generator Aggregator minimum size

Current requirements

- SONI Grid Code – references in ‘Glossary and Definitions’
- Eirgrid Grid Code – references in ‘Definitions’
 - Similar wording for the following definitions
 - “Aggregated Demand Site”
 - “Aggregated Generating Unit”
 - “Demand Side Unit”
 - “Demand Side Unit Operator”
 - “Generator Aggregator”
- The requirement is to have a MW capacity of not less than 4MW

Opportunities

- There is a push to increase the use of renewable generation available via increasing the SNSP limit.
- Provision of DS3 services enhances the ability to run with higher SNSP levels.
- DS3 services are contracted at 1MW and above for each service.
 - DS3 services are currently non-discriminatory on technology.
- Capacity Market awards from 0MW upwards
- Capacity Market derates on duration of unit

Aggregated Units

- There are a number of Individual Demand Sites (IDS) that are aggregated to provide dispatchable ‘energy’.
 - Each IDS can have different DS3 capabilities.
 - Each IDS can have different duration capabilities.
- Grouping these to form a 4MW unit could mean limiting the DS3 provision and the duration capability to the ‘lowest’ denominator.
- This doesn’t allow the most effective support to the operation of the System .

Example

- 7 sites in total. Each 0.6MW, equates to 4.2MW which achieves Grid Code requirements for a DSU registration.
- DS3 ability
 - 3 sites can perform **Dynamic** DS3 response, 1.8MW
 - 4 sites can perform **Static** DS3 response, 2.4MW
 - Of these 4 sites, they may have different duration for dispatch
 - 6-hour duration
 - 2-hour duration

Impact of modifications

- There are likely to be no significant changes required to the IT systems of SONI & Eirgrid.
- EDIL can handle declarations down to 1MW for all registered units.
- Scheduling is based on declared availability rather than the registered MW capability
- There is likely to be an increase in registered units in the markets.
- Costs for this are carried by the User / Participant.

Proposal

- The references to 4MW in the definitions are to be replaced with 1MW.
- Removal of TSO agreement for less than 4MW, in the AGU definition.



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Questions

Grid Code Requirements for Offshore PPMs

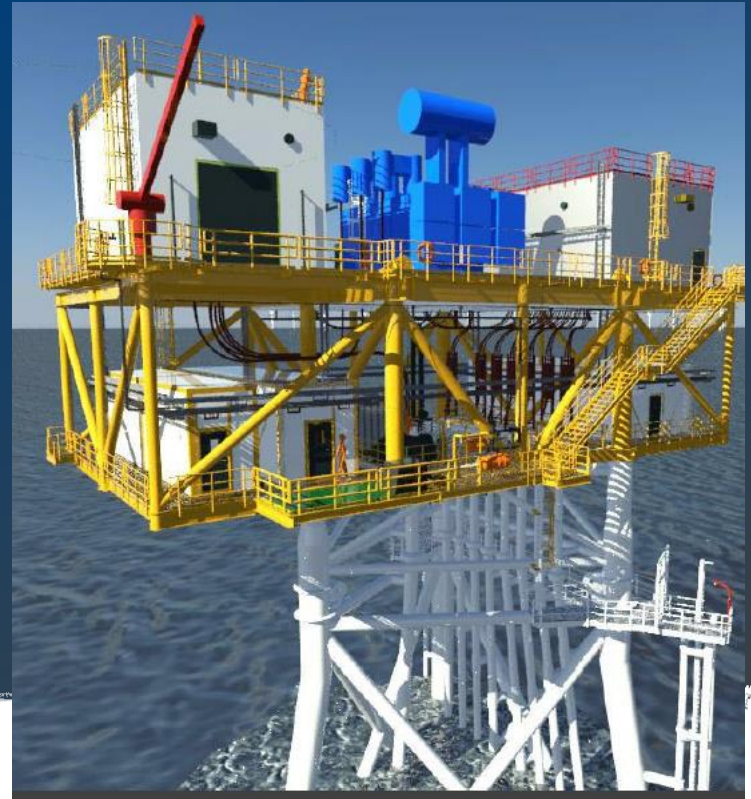
Cathal Martin
Grid Manager Ireland
SSE Renewables



JGCRP

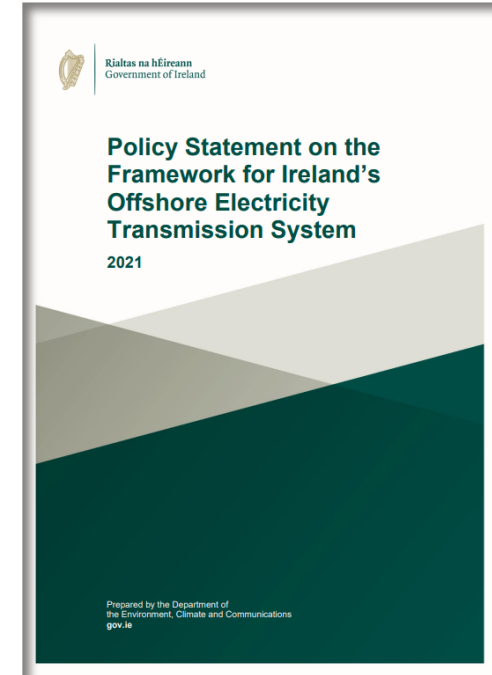
Offshore Grid Code Requirements Connection Point Offshore

July 2021

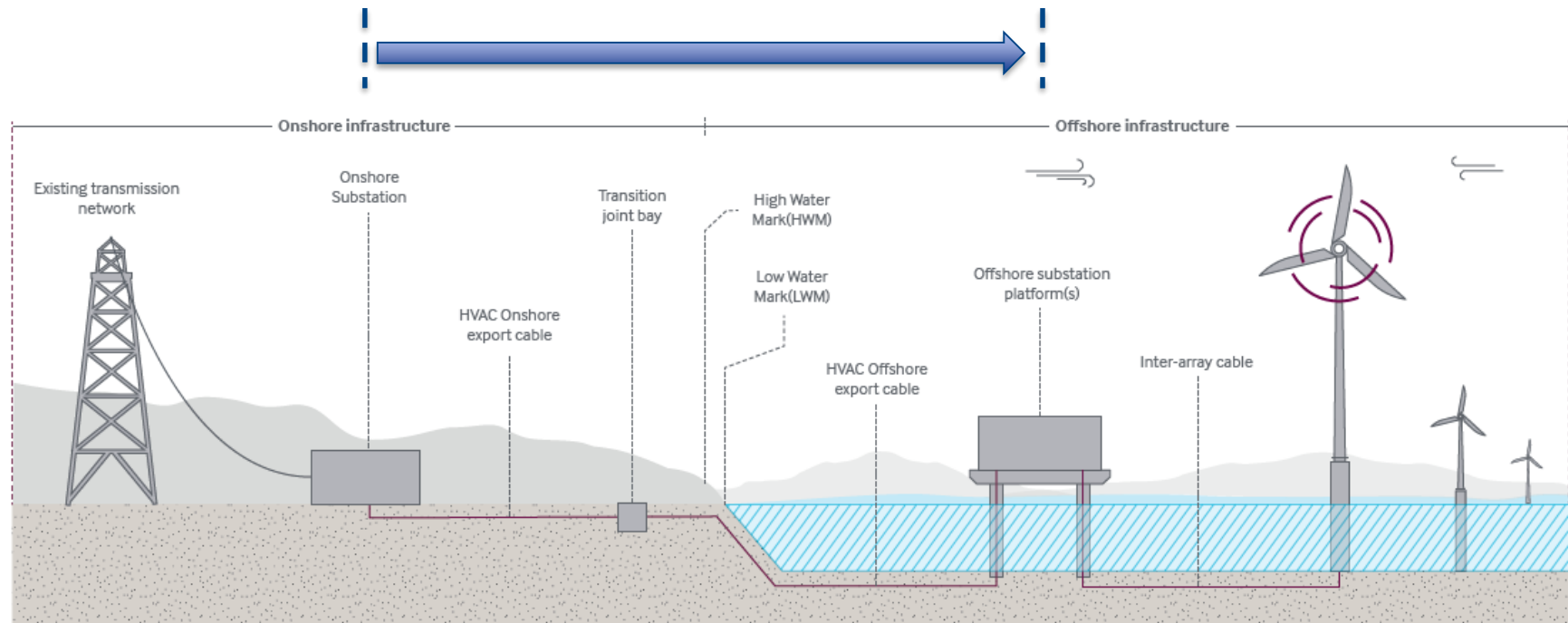


Offshore Grid Model Decision

- 13th May 2021 DECC publish Policy Statement on the Framework for Ireland's Offshore Electricity Transmission System
- The key elements to this decision are
 - EirGrid designated as Offshore TSO & TAO
 - Ownership boundary/ connection point for offshore projects moves from onshore to offshore
 - Phase 1 offshore projects (ORESS 1) will develop and build offshore transmission infrastructure and new onshore infrastructure up to the existing onshore grid
 - Offshore projects must comply with the Grid Code and EirGrid Functional Specs
 - Asset transfer to EirGrid occurs prior to energisation



Change of Ownership Boundary/ Grid Code Compliance Point



Article 23

(1) The requirements set out in this Chapter apply to the connection to the network of AC-connected power park modules located offshore. An AC-connected power park module located offshore which does not have an offshore connection point shall be considered as an onshore power park module and thus shall comply with the requirements governing power park modules situated onshore.

(3) AC-connected offshore power park modules within the scope of this Regulation shall be categorised in accordance with the following offshore grid connection system configurations:

- a) configuration 1: AC connection to a single onshore grid interconnection point whereby one or more offshore power park modules that are interconnected offshore to form an offshore AC system are connected to the onshore system;*
- b) configuration 2: meshed AC connections whereby a number of offshore power park modules are interconnected offshore to form an offshore AC system and the offshore AC system is connected to the onshore system at two or more onshore grid interconnection points.*

Network Code RfG – Chapter 4 (Requirements for Offshore PPMs)

Article 25

Table 11
Parameters for Figure 8

Synchronous area	Maximum range of Q/P_{\max}	Maximum range of steady-state voltage level in PU
Continental Europe	0,75	0,225
Nordic	0,95	0,150
Great Britain	0 (***) 0,33 (****)	0,225
Ireland and Northern Ireland	0,66	0,218
Baltic	0,8	0,22

Article 26

 At the offshore connection point for configuration 1.

 At the offshore connection point for configuration 2.

Offshore Grid Code Requirements

- EirGrid and ESNB consulted on RfG parameters in 2018

Article 21.3.b (i) and (ii) & Article 25.5: PPM: Parameters required for U-Q/Pmax Profiles

Connection Voltage	Parameter	Parameter in RfG (outer envelope)	Consultation Proposal (Inner Envelope)	Type Applicability	Justification Code
110 kV	u_{min}	0.875 p.u.	0.9 p.u.	D PPMs and Offshore PPMs	1
	u_{max}	1.1 p.u.	1.1 p.u.	D PPMs and Offshore PPMs	2
	Q_{min}/P_{max} (lead)	-0.5 p.u.	-0.33 p.u.	D PPMs and Offshore PPMs	1
	Q_{max}/P_{max} (lag)	0.65 p.u.	0.33 p.u.	D PPMs and Offshore PPMs	1
220 kV	u_{min}	0.875 p.u.	0.9 p.u.	D PPMs and Offshore PPMs	2
	u_{max}	1.1 p.u.	1.1 p.u.	D PPMs and Offshore PPMs	2
	Q_{min}/P_{max} (lead)	-0.5 p.u.	-0.33 p.u.	D PPMs and Offshore PPMs	1
	Q_{max}/P_{max} (lead)	0.65 p.u.	0.33 p.u.	D PPMs and Offshore PPMs	1
400 kV	u_{min}	0.875 p.u.	0.875 p.u.	D PPMs and Offshore PPMs	1
	u_{max}	1.1 p.u.	1.05 p.u.	D PPMs and Offshore PPMs	1
	Q_{min}/P_{max} (lead)	-0.5 p.u.	-0.33 p.u.	D PPMs and Offshore PPMs	1
	Q_{max}/P_{max} (lag)	0.65 p.u.	0.33 p.u.	D PPMs and Offshore PPMs	1

Table 27: Definition of a U-Q/Pmax-profile at Maximum Capacity PPMs:
connected @ ≥ 110 kV or more

Offshore Grid Code Requirements

- SONI and NIE consulted on RfG parameters in 2018

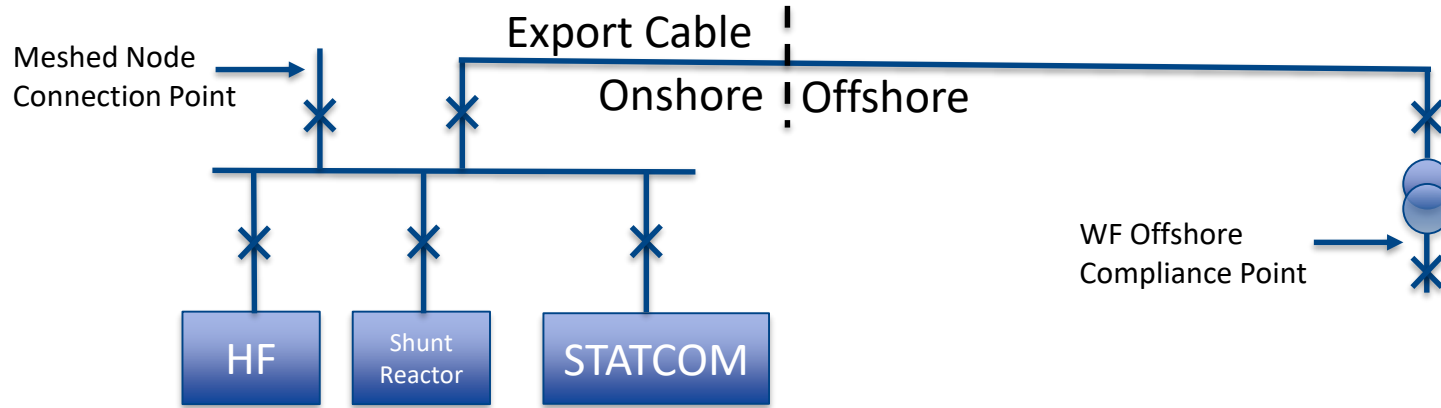
Article 21.3.b (i) and (ii) & Article 25.5: PPM: Parameters required for U-Q/Pmax Profiles

PPMs connection at a voltage level ≥ 110 kV

Connection Voltage	Parameter	Parameter in RfG (outer envelope)	Consultation Proposal (Inner Envelope)	Article Number	Type Applicability	Justification Code
110 kV	u_{min}	0.875 p.u.	0.9 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1
	u_{max}	1.1 p.u.	1.1 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1
	Q_{min}/P_{max} (lead)	-0.5 p.u.	-0.33 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1
	Q_{max}/P_{max} (lag)	0.65 p.u.	0.33 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1
275 kV	u_{min}	0.875 p.u.	0.9 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1
	u_{max}	1.1 p.u.	1.1 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1
	Q_{min}/P_{max} (lead)	-0.5 p.u.	-0.33 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1
	Q_{max}/P_{max} (lead)	0.65 p.u.	0.33 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1
400 kV	u_{min}	0.875 p.u.	0.875 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	3
	u_{max}	1.1 p.u.	1.05 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	3
	Q_{min}/P_{max} (lead)	-0.5 p.u.	-0.33 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1
	Q_{max}/P_{max} (lag)	0.65 p.u.	0.33 p.u.	21.3.b (ii)	D PPMs & offshore PPMs	1

Table 23: Definition of a U-Q/Pmax-profile at Maximum Capacity PPMs: connected @ ≥ 110

Typical GB Offshore WF Design (Reactive Power Compliance)



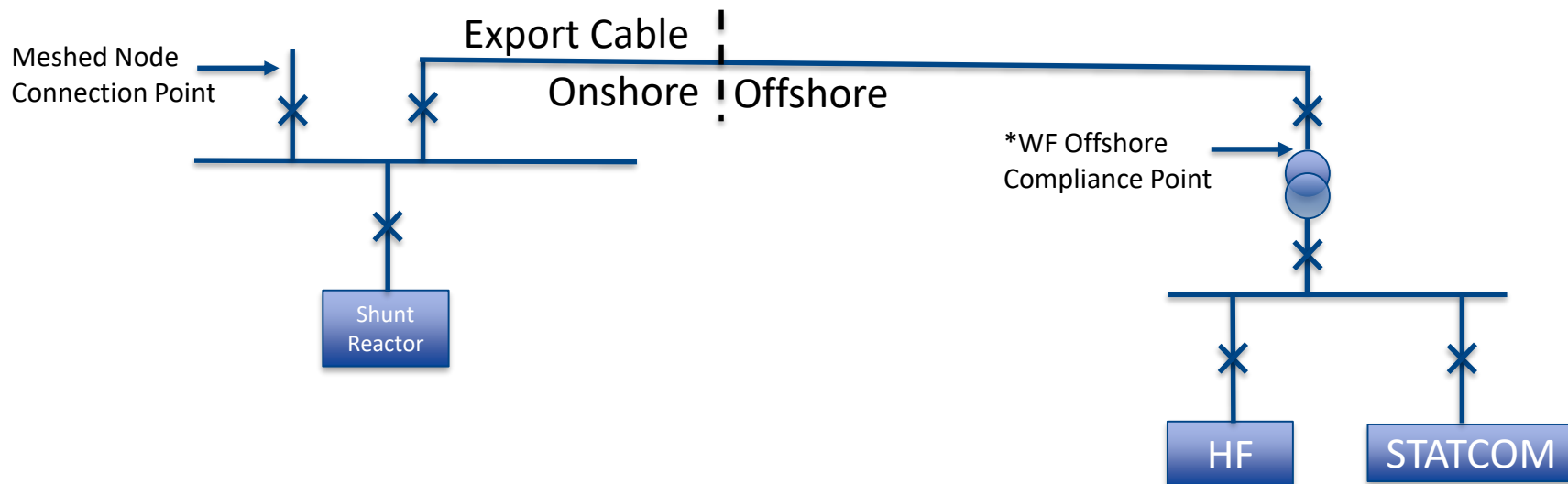
Offshore Compliance Point

- Offshore Wind Farm provides 0 MVAr

Onshore Meshed Node Connection Point

- Shunt Reactor compensates for export cable
- STATCOM provides Q_{min}/P_{max} of ± 0.33
- Harmonic Filter ensures Power Quality compliance at meshed node

Potential ROI & NI Offshore WF Design (Reactive Power Compliance)



Offshore Compliance Point

- STATCOM required if turbines can't achieve Q_{min}/P_{max} of ± 0.33
- Harmonic Filter required if Power Quality issue at Offshore Connection Point

Meshed Node Connection Point

- Shunt Reactor compensates for export cable at meshed node

Disadvantages of current ROI & NI Offshore GCC Requirements

- Reduces the turbines options available to developers that comply with reactive power requirement without a STATCOM
- The Offshore Substation Platform (OSP) is one of the biggest costs for an Offshore Windfarm and OSP cost is very sensitive to size and weight. The cost of installing a STATCOM or Harmonic filter offshore is significantly more expensive per tonne than installing onshore
- Reliability risk greater with STATCOM and Harmonic Filter offshore
- Providing VARs from offshore reduces the maximum rating of export cable

Request to EirGrid & SONI

- Reconsult on Offshore PPM RfG parameters now that industry is more informed and engaged in the process

This issue is more time critical for ROI offshore projects. It has a fundamentally impact upon Phase 1 project designs and therefore ORESS 1 bids. ORESS 1 is currently scheduled for Q2 2022. ORESS 1 projects need clarity on this as soon as possible. Projects will need price certainty in Q1 2022. CRU has suggested that all consultations that impact upon ORESS need to be completed by end of 2021.

Questions

Registered Capacity Definition Review

Miriam Ryan
EirGrid



Registered Capacity Definition Review

- Established on an all-island basis;
- Includes both Grid Codes and Distribution Codes;
- Finalising the ToR;
- Meeting monthly;
- Currently identifying key issues;
- Updates to be given at JGCRP meetings and respective DCRP meetings.

Registered Capacity Definition Review

Questions

Regulatory Update

CRU and Utility Regulator
20 July 2021

AOB