

Submission Document

The terms and conditions to act as defence service provider for Ireland

In accordance with the requirements of
Articles 4 and 7 of the Commission
Regulation (EU) 2017/2196
Establishing a network code on
electricity emergency and restoration

16th October 2020



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Submission

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1.Purpose

The purpose of this document is to address EirGrid's requirement to consult on the Terms and Conditions related to the provision of System Defence services. Some background material is presented and then the relevant Network Code Articles from the Emergency and Restoration Code are re-produced. The subsequent section sets out EirGrid's approach regarding the relevant requirements.

In accordance with COMMISSION REGULATION (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration (referred to as NCER), the Transmission System Operator (TSO) of a member state is required to submit the proposals to the relevant regulatory authority on the following;

- The terms and conditions to act as a defence service providers on a contractual basis in accordance with Article 4 (4); (or notify the relevant national legal framework if not established on a contractual basis)

The Terms and Conditions relate to the characteristics of the service being provided as well as the possibility and conditions for aggregation.

This is a revised version of the terms and conditions following a previous submission to the Commission for Regulation of Utilities (CRU).

This document should be read together with its companion document, the System Defence Plan (SDP) which contains the details of the defence services required by the TSO.

2. Introduction

The first version of the terms and conditions proposal documentation was consulted on from the 14th November 2018 to 12th December 2018 and received no responses. On 18th December 2018, EirGrid submitted the following proposals relating to the SDP to the CRU:

- a) Terms and conditions to act as a defence service provider
- b) List of significant grid users Ireland (the TSO stated there are no High priority grid users so did not provide a list)
- c) Design of the System Defence Plan

Documents a) and b) are required to be approved by the CRU while the design of the SDP is only required to be notified to the CRU. However, the SDP strongly interacts with the NCER documents that do require approval and should be considered together as a package. On the 2nd September 2019, the CRU published a decision to not approve documents a) and b) above and seek amendments to all the documents submitted by EirGrid. In addition to meeting the terms and conditions requirements as stipulated in NCER, this document also addresses CRU feedback in this revised terms and conditions document.

EirGrid held a second consultation on our revised proposed terms and conditions to act as a defence service provider. This consultation opened on 8 July 2020 for an extended period of 6 weeks until 21 August 2020. It was available to download on the EirGrid Group and ESBN websites and was discussed at the All Island Forum on 12 August 2020.

EirGrid (TSO) and ESBN (DSO) received no submissions on the consultations.

2.1 Relevant Network Code Articles

The NCER articles relating to this terms and conditions document are copied below. This document on terms and conditions for defence service providers, together with our procurement principles are considered compatible with the requirements of Article 4 (1) and where it is identified that defence services are provided on a contractual basis these are in line with Article 4 (4).

Reference is made to the design of the SDP proposal which is integral to this document and is where the detail on the defence services, and when they are activated, is provided. It is the detail in the SDP which specifically meets the objectives of Article 11 (6).

Article 4 (1) *When applying this Regulation, Member States, regulatory authorities, competent entities and system operators shall:*

- (a) *Apply the principles of proportionality and non-discrimination;*
- (b) *Ensure transparency;*
- (c) *Apply the principle of optimisation between the highest overall efficiency and lowest total costs for all parties involved;*
- (d) *Ensure the TSOs make use of market-based mechanisms as far as possible to ensure network security and stability;*
- (e) *Respect technical, legal, personal safety and security constraints;*
- (f) *Respect the responsibility assigned to the relevant TSO in order to ensure system security, including as required by national legislation;*
- (g) *Consult with the relevant DSOs and take into account of potential impacts on their system; and*
- (h) *Take into consideration agreed European standards and technical specifications.*

Article 4 (2) *Each TSO shall submit the following proposals to the relevant regulatory authority in accordance with Article 37 of Directive 2009/72/EC for approval:*

- (a) *the terms and conditions to act as defence service providers on a contractual basis in accordance with paragraph 4;*
- (b) *the terms and conditions to act as restoration service providers on a contractual basis in accordance with paragraph 4;*
- ... (c) & (d) ...not included as not referenced in Article 7(1), see below...;
- (e) *the rules for suspension and restoration of market activities in accordance with Article 36(1);*
- (f) *specific rules for imbalance settlement and settlement of balancing energy in case of suspension of market activities, in accordance with Article 39(1);*
- (g) *the test plan in accordance with Article 43(2).*

Article 4 (4) *The terms and conditions to act as defence service provider and as restoration service provider shall be established either in the national legal framework or on a contractual basis. If established on a contractual basis, each TSO shall develop by 18 December 2018 a proposal for the relevant terms and conditions, which shall define at least:*

- (a) *the characteristics of the service to be provided;*
- (b) *the possibility of and conditions for aggregation; and*
- (c) *for restoration service providers, the target geographical distribution of power sources with black start and island operation capabilities.*

Article 4 (6) *Where a TSO is required or permitted under this Regulation to specify, establish or agree on requirements, terms and conditions or methodologies that are not subject to approval in accordance with paragraph 2, Member States may require prior approval by the regulatory authority, the entity designated by the Member State or other competent authorities of the Member States of these requirements, terms and conditions or methodologies.*

Article 7 (1) *The relevant TSOs shall consult stakeholders, including the competent authorities of each Member State, on proposals subject to approval in accordance with points (a), (b), (e), (f) and (g) of Article 4(2). The consultation shall last for a period of not less than one month.*

Article 11 (6) *The measures contained in the SDP shall comply with the following principles:*

- (a) *their impact on the system users shall be minimal;*
- (b) *they shall be economically efficient;*
- (c) *only those measures that are necessary shall be activated; and*
- (d) *they shall not lead the TSO's transmission system or the interconnected transmission systems into emergency state or blackout state.*

2.2 TSO Considerations

The Legal Framework in Ireland comprises of Statutory Instrument SI445/2000 (Internal Market in Electricity), which provides for a licensed TSO. EirGrid is the licensed TSO and is responsible for the operation of the electricity transmission system in Ireland.

This TSO licence includes Condition 3 (General Functions) which lays out the main functions of the TSO including that the TSO shall “*operate and ensure the maintenance of and, if necessary, develop a safe, secure, reliable, economic and efficient electricity transmission system.... with a view to ensuring that all reasonable demands for electricity are met and having due regard for the environment.*” To meet this objective the TSO “*shall ensure the availability of all Ancillary Services which are necessary*” to carry out these functions.

The Ancillary Services referred to in the licence, are defined by the Grid Code as: “*A service, other than the production of electricity, which is used to operate a stable and secure Power System including. Reactive Power, Operating Reserve, Frequency Control and Blackstart Capability*”. Some ancillary services that are common to many providers have been grouped together under the DS3 (Deliver a Secure, Sustainable electricity System) programme - please see EirGrid’s web-site¹ for further information. Note that the terms of provision of DS3 System Services have undergone extensive consultation with Regulators and Industry. A DS3 System Service agreement² is the standard contract that EirGrid provides to System Service providers. It includes 14 products or services including Operating Reserve and Reactive Power.

Condition 29 of the TSO licence provides for a Grid Code where the TSO “*shall adopt and at all times have in force and shall implement and comply with a Grid Code.*” The Grid Code is the technical document which establishes the rules governing the operation, maintenance and development of the transmission system and sets out the procedures for governing the actions of all transmission system users.

¹ <http://www.eirgridgroup.com/how-the-grid-works/ds3-programme/>

² http://www.eirgridgroup.com/site-files/library/EirGrid/Ire-DS3-System-Services-Regulated-Arrangements_final.pdf

EirGrid as TSO licence holder has been contracting for Ancillary / System Services to maintain a stable and secure transmission system and, has administered the development of the Grid Code and associated procedures since its inception and for many years prior to the NCER becoming part of EU legislation. This document, in tandem with the SDP, seeks to rationalise, in a transparent manner, how the existing services on the transmission system can be mapped onto the NCER definitions of *defence services* and *defence service providers*. To assist with achieving this outcome, mapping tables are used to reference relevant Grid Code requirements and where ancillary services are commercially procured.

For the avoidance of doubt, EirGrid is not proposing herein any new services or terms and conditions for providers; it is merely identifying how the NCER requirements in accordance with Article 4 (4) are being met by confirming the terms and conditions to act as a defence service provider is established in either the existing national legal framework or an existing commercial contract.

3. Defence Service Providers

The System Defence Plan (SDP) considers and categorises the defence services. The SDP also groups the Significant Grid Users (SGUs) for the Ireland transmission system as defined by NCER.

The mapping table, Table 1 below, is copied from the SDP (SDP section 4.3), and lists the defence services against the relevant (SGU) groups who are able to provide the service. However, in the cell denoting the positive mapping highlighted in yellow, the “X” has been replaced with a letter, e.g. “A”, to help identify how each service is defined or procured, see **Error! Reference source not found.**). Please note that where the letter is repeated in Table 1 the same clause references are being used by similar SGU groups to specify that defence service.

For clarity, while FRR and RR (Frequency Restoration Reserve and Replacement reserve respectively) may operate as the transmission system transitions from Normal to Emergency state, they are categorised as both remedial action and defence service measures depending on what system state is active at the time the action is initiated. Please see SDP (SDP section 4.2) for further details on what is categorised as a system defence measure.

Note that where there is a contractual basis or a payment for this service this is highlighted in red text in Table 2.

	SGUs							
Individual System Defence Measure / Service	Type D Generator (T-Connected)	Type D Generator (D-Connected)	Type C Generator	Type B Generator	Aggregators of Gen/ Dem	T-Conn Demand Facility	Interconnector Owners	T-Conn closed Distribution Systems
Authority to disconnect SGUs	A	B	B	B	C	D	E	
Operational Reserve (FRR) (Inc. Turlough Hill)	F	G	G	G	H			
Replacement Reserve (RR)	I	I	I	I	I			
Active power set points when Freq./ Power Flow is outside Alert limits and system adequacy is lacking	J	K	K	L	M			
Special Protection Schemes (Inc. Step wise linear diaconnection)	N	O	O	O				
Over Frequency Generator Shedding Scheme	P							
Reactive power set-points	Q							
Interconnector Emergency Assistance (MWs) & Making Mvars available							R	

Table 1 - SDP Services mapped against SGU Groupings

Table 2 – Look up table for reference (from Table1)

Table 1 Cell Reference	References to where service is defined and/or procured	Table 1 Cell Reference	References to where service is defined and/or procured
A	GC CC.10.9.2 (Gen to install additional protection & control schemes); OC.6.7.4.1 (User de-energisation by TSO)	J	GC SDC2 (Centrally Dispatched Active Power); PPM1.5.2 (Controllable PPMs - Active Power Management); GC OC.2.6.2.1 (TSO requests to amend outage plan); OC.2.7.2 (For SoS reasons TSO requests alterations to maintenance) Provision is via the Balancing Market
B	GC CC.10.10.2(DSO to install additional protection schemes); OC.6.7.4.1 (User de-energisation by TSO); D-Code DPC4.4.4 (DSO may disconnect Users inc. for maintaining satisfactory operation of Transmission System)	K	GC SDC2 (Centrally Dispatched Active Power); PPM1.5.2 (Controllable PPMs - Active Power Management); OC.2.6.2.1 (TSO requests to amend outage plan); OC.2.7.2 (For SoS reasons TSO requests alterations to maintenance); D-Code DCC10.1.2 (All centrally dispatched Gens have to comply with relevant sections of GC inc. Technical Performance ref: DCC 10.5.1 (a)); DCC11.3.2.2 (Controllable PPMs - Active Power Control) . Provision is via the Balancing Market
C	GC OC.6.7.4.1 (User de-energisation by TSO); D-Code DPC4.4.4 (DSO may disconnect Users inc. for maintaining satisfactory operation of Transmission System)	L	GC PPM1.5.2 (Controllable PPMs - Active Power Management); GC OC.2.6.2.1 (TSO requests to amend outage plan); OC.2.7.2 (For SoS reasons TSO requests alterations to maintenance); D-Code DCC11.3.2 (Controllable PPM - Active Power Control). Provision is via the Balancing Market
D	GC OC.5.4 (Demand Control); OC.6.7.4.1 (User de-energisation by TSO);	M	GC SDC2 (Centrally Dispatched Active Power); OC.2.6.2.1 (TSO requests to amend outage plan); OC.2.7.2 (For SoS reasons TSO requests alterations to maintenance). Provision is via the Balancing Market .
E	GC OC.6.7.4.1 (User de-energisation by TSO); IOP (Emergency Instruction to OMW - Safety or System Security)	N	GC CC.10.9.2 (TSO to require Gens to install additional protection & control schemes)
F	GC CC.7.3.1 (General clause for Gens to have the following characteristics:); CC.7.3.1.1 (u) (Specific clause: Operating Reserve TOR now FRR) ; Pump storage provision is via a System Services Contract (DS3)	O	GC CC.10.10.2 (TSO to require the DSO to install additional protection schemes inc. on Users)
G	GC CC.7.3.1 (General clause for Gens to have the following characteristics:); CC.7.3.1.1 (u) (Specific clause: Operating Reserve TOR now FRR) ; D-Code DCC10.1.2 (All centrally dispatched Gens have to comply with relevant sections of GC inc. Technical Performance ref: DCC 10.5.1 (a)); DCC10.10.3 (Conventional units to have frequency response in accordance with GC OC4). Provision is via a System Services Contract (DS3)	P	GC OC.6.7.4.1 (f) (De-energisation of Users by TSO - specifically for causing frequency to operate outside standards)
H	FRR characteristics are defined in the GC, however, any provision from Demand Side Units/ Aggregators is via a System Services Contract (DS3)	Q	GC OC.4.4 (General - Voltage Control strategies used by TSO); CC.7.3.8 (Gens to have continuous AVR - maintain reactive power set point) OC.4.4.5.8 (TSO shall dispatch Gens to adjust reactive power output); OC.4.4.6.1.1 (TSO request Gens to operate outside declared MVar range) Provision via a System Services Contract (DS3)
I	GC OC.4.6.3.6 (Provides definition of RR) but provision via a System Services Contract (DS3)	R	GC CC.7.5.1 (I/C services are detailed in IOP); CC.7.5.1.2 (I/C to cooperate with TSO when system is stressed); OC.2.6.2 (TSO requests to amend outage plan) & OC.2.7.2 (For SoS reasons TSO requests alterations to maintenance); OC.4.4.5.8 (TSO to adjust reactive power output) & OC.4.4.6.1.4 (TSO request I/C to operate outside declared MVar range) ; IOP (Emergency Assistance for Active Power - Reactive Power). Provision is via the BSA .

3.1 Discussion

As can be seen from Table 2, a significant majority of the defence services are defined by the Grid Code (GC). References are taken therein from the Connection Conditions (CCs), Operating Conditions (OCs) and the Scheduling and Dispatch Code (SDC). The Distribution Code is also referenced where distribution connected generators are to abide by the relevant sections of the GC.

Next to each clause referenced in Table 2, is a short bullet point summarising the clause. For the avoidance of doubt, these summaries should be regarded as an aid to the reader and if there are any differences between the interpretations of this summary and the full GC clause, the GC clause interpretation takes precedence.

The NCER references two options for procuring a defence service provider, either in the national legal framework or on a contractual basis. However, given how the market in Ireland has developed it may be easier to discuss two variations (in turn) of the contract basis, see Table 3.

	Capability/ Service Characteristics	How Procured?	Payment/ Recompense
Contractual Basis - Full	Contract	Voluntary	Contract
Contractual Basis - Part	Grid Code	Compulsory	Contract
National Legal Framework	Grid Code	Compulsory	None

Table 3 - Types of Contracts

Contractual Basis – Full: These are services that are paid for via a contract and the defence service provider voluntarily provides that service, i.e. it is not mandated by the GC to provide. Examples include Replacement Reserve (all providers) or Frequency Restoration Reserve (FRR) (non- generator providers).

Contractual Basis – Part: The ‘middle’ category is where the provider is mandated by the GC to offer this service when operational; however, they are recompensed. Generators

providing FRR or steady state reactive power fall into this category as do providers of additional active power (instructed by TSO during Emergency state) who receive payment via the Balancing Market or Interconnectors providing Emergency Assistance via a their Balancing and Ancillary Services Agreement (BASA).

National Legal Framework: These are services that are solely referenced against the GC. They are thus classified as established in the national legal framework as they are mandated by the GC and no recompense is due, for example, disconnecting a generator to protect the wider system.

Using the 3 colours from Table 3 above, Table 4 below demonstrates how each service is divided into the 3 contract types described above.

	SGUs							
Individual System Defence Measure / Service	Type D Generator (T-Connected)	Type D Generator (D-Connected)	Type C Generator	Type B Generator	Aggregators of Gen/ Dem	T-Conn Demand Facility	Interconnector Owners	T-Conn closed Distribution Systems
Authority to disconnect SGUs	X	X	X	X	X	X	X	
Operational Reserve (FRR) (Inc. Turlough Hill)	X	X	X	X	X			
Replacement Reserve (RR)	X	X	X	X	X			
Active power set points when Freq./ Power Flow is outside Alert limits and system adequacy is lacking	X	X	X	X	X			
Special Protection Schemes (Inc. Step wise linear diaconnection)	X	X	X	X				
Over Frequency Generator Shedding Scheme	X							
Reactive power set-points	X							
Interconnector Emergency Assistance (MWs) & Making Mvars available							X	

Table 4 - Table 1 updated to map services and SGUs to contract types

By removing the ‘national legal framework’ category, it is clear that the following defence services are provided on a contractual basis (either full or in part):

1. Frequency Restoration Reserve
2. Replacement Reserve
3. Active Power set point changes
4. Reactive Power set point changes
5. Interconnector (Emergency) Assistance

Service 1, 2 and 4 are characterised or defined in the GC and recompensed via DS3 System Services Agreements³ (Schedule 2 & Schedule 3 in the agreement refers). Note that these agreements are looking for a defined service and are technology neutral; that is the payment is on a regulated tariff basis on delivery against the specified requirements. For example, while Turlough Hill as a pump storage station, is unique on the Irish system, its under-frequency tripping service is classified as FRR or RR depending on the timescales of provision and recompensed accordingly.

Services 3 and 5 for Active power provision from Balancing units or an Interconnector respectively, are also characterised in the GC but are paid via the Balancing Market where the Trading and Settlement Code⁴ applies or via the Balancing and Ancillary Services Agreement (BASA). The BASA is a bilateral agreement between EirGrid and NGESO for the provision and payment of energy services to each other through the East West Interconnector.

It should be noted that while DS3 contracted providers are paid the tariff rate for being available to provide the service, if they are utilised to provide FRR there are also transactions in the Balancing Market for the new (part-load) positions taken.

As shown in Table 4, by only considering the aggregated SGUs, the contractual basis where aggregation is possible is the first 3 services shown above. For the two reserves services these are procured in accordance with the DS3 System Services Agreement, where the Grid Code defined Demand Side Units (may be associated with a demand site or demand sites) or Aggregated Generation Units are collectively described under “*Interface Agreement*” and specifically referred to as a Service Provider; clause 2.3.3 of

³ http://www.eirgridgroup.com/site-files/library/EirGrid/Ire-DS3-System-Services-Regulated-Arrangements_final.pdf

⁴ <https://www.sem-o.com/rules-and-modifications/balancing-market-modifications/market-rules/>

the Agreement refers. Therefore, for the relevant defence services FRR and RR, the SGUs are able to be the Service Provider either on individual or collective basis following pre-qualification in accordance with the System Operation Guideline (SOGL) and the terms and conditions of the DS3 System Services Agreement.

The third service on a contractual basis where aggregation is possible is Active Power set point changes, and again the definitions of Demand Side Unit and Aggregated Generation Units are used in the Trading and Settlement Code when registering participants (see Trading and Settlement Code, Part A, paragraph 2.34). While all participants above a de-minimis level of 10MW are registered individually on a mandatory basis; demand sites and generating units less than 10MW may volunteer to be aggregated as Demand Side Units and Aggregated Generation Units, respectively. The only other pre-requisite is that the aggregated sites must be dispatchable by the TSO.

4. Next Steps

This concludes EirGrid's submission to the Commission for the Regulation of Utilities of the terms and conditions to act as defence service provider for Ireland in accordance with the requirements of Articles 4 and 7 of the Commission Regulation (EU) 2017/2196 Establishing a network code on electricity emergency and restoration.

EirGrid would now like to request the approval of the CRU for this document.