

## *Submission Document*

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# The terms and conditions to act as restoration service provider for Ireland

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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

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16<sup>th</sup> October 2020



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Submission

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# 1. Introduction

The purpose of this document is to address EirGrid's requirement to consult on the Terms and Conditions related to the provision of System Restoration 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.

The first revision this document was consulted on from the 14<sup>th</sup> November 2018 to 12<sup>th</sup> December 2018 and received no responses. On 18 December 2018, a proposal was submitted to the Commission for Regulation of Utilities (CRU) for consultation. On the 2<sup>nd</sup> September 2019, the CRU published a decision to not approve the proposal and sought amendments to the document submitted by EirGrid plc. The purpose of this document is to consult on the revised proposals.

## 1.1. Background

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

- The terms and conditions to act as restoration service providers on a contractual basis in accordance with [Article 4] paragraph 4, (if such terms and conditions are established on a contractual basis)

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

## 1.2. Relevant Network Code Articles

**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:

(b) the terms and conditions to act as restoration service providers on a contractual basis in accordance with paragraph 4;

**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 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.

### 1.3. Legal Framework for Terms and Conditions

EirGrid is the licensed Transmission System Operator in Ireland and is responsible for the operation of the electricity transmission system in Ireland. As the designated TSO in Ireland, EirGrid is responsible for establishing these terms and conditions.

The Legal Framework in Ireland comprises the Statutory Instrument SI445/2000, as well as the Ireland Grid Code and any bilateral contracts that are consequential to the Grid Code requirements. Under SI445/2000, EirGrid as TSO is mandated to procure whatever services are necessary to ensure grid security.

The Ireland Grid Code furthermore details more specific requirements in relation to provision of Black Start services. In line with the above, EirGrid has a limited number of Ancillary Service Agreements in place for the provision of Black Start services. The amount, nature and location of the Black Start generation is kept under review and additional services will be procured if deemed necessary so as to ensure continued compliance with EirGrid's relevant legal obligations.

The existing Legal Framework for System Restoration comprises the Statutory Instrument (SI 445/2000) and EirGrid Grid Code clauses as listed in Table 1 below.

Requirement	Service	Currently Defined Within
<b>Ancillary Service</b>	TSO to ensure availability of ancillary services to operate the grid securely	SI 445/2000 Part 3 8(1)(a),(b)
<b>Power System Restoration</b>	Power System Restoration and provision for TSO System Restoration Plan	Grid Code OC 9.5.1
<b>Black Start Definitions and Requirements</b>	Availability of certain units to start up without external power supply	Grid Code OC4.7.1.1
	Availability of interconnectors to start up without external power supply	Grid Code OC4.7.1.1 and Interconnector Operating Protocol (as agreed with TSO)
	Reference to Ancillary Service Agreement	Grid Code OC4.7.3.2
<b>Power System Restoration</b>	Follow instructions issued by the TSO during restoration	Grid Code OC 9.5.2
<b>Black Start Testing</b>	Powers for TSO to carry out tests on black start units once per year	Grid Code OC10.5.7
<b>Requirements for Island Operation</b>	Following loss of transmission supply to a generation unit (with greater than 30 minutes start time) it must be capable of reducing output to match house load and sustain operation, i.e. trip to auxiliaries	Grid Code CC.7.3.2

**Table 11: Legal Framework for System Restoration**

In addition to the above requirements, Ancillary Service Agreements (bilateral contracts) between the TSO and Black Start providers which outline the terms and conditions including characteristics and details of compensation for provision of these services discussed in more detail in this document.

## 2. Public Consultation

EirGrid held a consultation on our proposed Terms and Conditions related to the provision of System Restoration services 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 of the Commission Regulation (EU). 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 EirGridGroup and ESBN websites and was discussed at the All Island Forum on 12 August 2020.

### 2.1. Summary of Responses

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

## 3. Terms and Conditions

### 3.1. Overview of System Restoration

The majority of generators on the Irish power system require external power supply to start-up and supply energy to the power system. The TSO has contracts in place with a number of Black Start Units that have the ability to start up without an external power supply. The providers include a diversity of fuel types, such as hydro generators, pumped storage, gas turbines, and an interconnector.

During a blackout, the power system is divided into four smaller systems referred to as the North, East, South and West subsystems. Each subsystem has at least one Black Start Unit. Once each subsystem has supply restored to enough customers to allow multiple generators operate stably, those subsystems are joined together to form a single system and restoration continues. Synchronising facilities are available at various locations on the transmission system for this purpose.

There are a total of twenty Black Start Units (incorporating units for top-down and bottom-up restoration) located across seven Black Start Stations, as shown in Figure 1. Ancillary Service Agreements are in place with each of these Black Start Stations to provide this service. Operational and testing requirements for Black Start Stations are



detailed in EirGrid Grid Code OC 4.7 and OC.10.5.7 respectively. Based on the location of the current Black Start Stations, subsystems for restoration have been identified and incorporated in to the Power System Restoration Plan (PSRP). If the number or locations of these Black Start Stations were to change then the subsystems would be reviewed to ensure restoration to all parts of the power system could be achieved. The PSRP would then be updated to reflect the characteristics of the network.

The Network Code on Emergency Restoration distinguishes between top-down and bottom-up re-energisation strategies (Article 26). Top-down refers to re-energisation with assistance from a neighbouring TSO, and in the case of Ireland, this would mean using EWIC's blackstart capability to get supply from Great Britain, or getting supply from Northern Ireland if those systems are not also in a blackout state. Bottom-up re-energisation details a scenario using a black start unit such as a hydro or diesel unit to energise the system. There are nineteen providers available for use in a bottom-up re-energisation. It is expected that to restore the system back to normal state in an efficient manner, that a combination of top-down and bottom-up re-energisation strategies would be used in the event of a blackout in Ireland.



Figure 1- Simplified overview of Black Start Stations and Subsystem Borders

### 3.2. Characteristics of Restoration Service Providers

A black start provider must provide black start capability from each of its black start stations in accordance with the technical requirements of the Grid Code and the relevant operating parameters for each designated black start station outlined in the Ancillary Services Agreement.

In accordance with Grid Code OC4.7.1.1 a unit must be capable of starting up without an external electrical supply.

Following a blackout on the power system, the TSO will issue a dispatch instruction (in the form of a blackout alert signal) which is issued to all black start stations immediately following confirmation that the system is in a blackout state. Following the issue of a blackout signal (referred to as a blue alert signal in the agreement) the black start unit or units at the black start station must be started up to energise the system up to their connection point in accordance with its black start plan within the contracted black start time of 60 minutes.

The service provider shall develop, maintain and practice a plan for achieving black start at each black start station and on request shall supply a copy of this plan to the TSO. This plan shall be regularly tested and maintained with reports to be made available to the company for information and shall notify the company on any changes made.

### 3.3. Requirements for Aggregation

The Ancillary Service Agreement defines the minimum number of black start units in a black start station required to have black start capability in order for the station to be deemed to have black start capability. This is defined for each black start station following testing. Payments for black start are only received if the minimum numbers of black start units are available.

### 3.4. Geographical Requirements

For the purposes of restoration the system is divided in to four smaller subsystems (as in Figure 1 above) to speed up the restoration process. The following outlines the minimum required geographical distribution required to supply sufficient black start capacity in each region. These requirements reflect the amount of load and generation in each area.

<b>Subsystem</b>	<b>Minimum Requirements</b>	<b>Current Technologies Contracted</b>
<b>North</b>	2 x 20MVA	Hydro
<b>East</b>	2 x 100MVA	Interconnector, pumped storage, hydro
<b>South</b>	2 x 50MVA	Gas turbines, hydro
<b>West</b>	2 x 20MVA	Hydro

In the event of a blackout the restoration plan has been designed so that the minimum requirements are black started in each of the four subsystems. As there are twenty black start units contracted by the TSO across seven black start stations it is expected that sufficient units will be available to meet these requirements. The four separate subsystems will be restored in parallel to speed up overall system restoration. If the minimum requirements cannot be met in a subsystem restoration from another subsystem will be extended to restore supply.

If the minimum requirements cannot be achieved for a subsystem due to changes to the black start providers the TSO will seek to procure alternative black start providers. Following a change of black start providers the Power System Restoration Plan is reviewed with existing and new providers and the minimum requirements per subsystem will be reviewed so that the TSO can restore supply to a number of areas in parallel.

### 3.5. Payments for Black Start Providers

Black start stations receive payments for every half hour they are available to black start. The black start station capability is determined for each 30 minutes period. Payments

are received when the number of the black start units is greater than or equal to the minimum required in that period. The payment rate for black start capability for each black start station is set out in the Ancillary Services Statement of Payments and Charges. Payment rates are reviewed annually and subject to the approval of the Regulatory Authority.

Black start testing is carried out by the TSO in accordance with Grid Code OC.10.5.7. The TSO has the right to carry out a test of one black start unit in each black start station annually. If the unit successfully starts up within the black start achievement time (set to 120 minutes in the Agreement) but has failed to start up within the black start contracted time (set to 60 minutes in the Agreement) then a partial failure charge is payable by the service provider. This is a loss of payments for 30 days. If the unit fails to start up within the black start achievement time then a total failure charge is applied. This results in a loss of payments for 90 days. These charge rates are outlined in the Ancillary Services Statement of Payments and Charges and subject to Regulatory Authority approval.

### 3.6. TSO Position

The amount and availability of black start providers has been reviewed regularly and is sufficient for system security presently. However, more recently, we have noted developments as follows:

- The direction provided by ER NC Article 4 (Regulatory Aspects)
- The rapidly evolving nature of the power system and the generation portfolio
- Possibly novel technologies emerging presently; and
- The possibility of creating new national requirements on black-start service provision

In the coming calendar year, EirGrid will carry out a comprehensive review having regard for the above also. Following on from this review, EirGrid will scope out a procurement exercise for the provision of Blackstart Procurement services in Ireland, subject to approval from CRU, consistent with Article 4 of ER (Regulatory Aspects.)

## 4. Next Steps

This concludes EirGrid's submission to the Commission for the Regulation of Utilities of the terms and conditions to act as restoration 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 propose document.

Submission