Submission Document

Design of the Test Plan for Ireland

In accordance with the requirements of Articles 43 and 44 to 47 of the Commission Regulation (EU) 2017/2196 Establishing a network code on electricity emergency and restoration

27th August 2021

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Public Consultation

EirGrid (TSO) held a consultation on our proposed Design of Test Plan for Ireland in accordance with the requirements of Articles 43 and 44 to 47 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 9 April 2021 for a period of 4 weeks until 7 May 2021. It was available to download on the EirGrid Group website. It was presented at the All Island Forum on 29 April 2021.The presentation[1] is now available on the EirGrid Group website.

Summary of Responses

EirGrid received no submissions on this consultation.

[1] https://www.eirgridgroup.com/customer-and-industry/european-integration/information/

1. Abbreviations

- TSO – Transmission System Operation
- NCER – Network Code for Emergency Restoration
- SOGL – System Operator Guideline
- RfG – Requirements for Generators
- HVDC – High Voltage Direct Current
- DCC – Demand Connection Code
- DSO – Distribution System Operator
- SGU - Significant Grid User
- NCC – National Control Centre
- SDP – System Defence Plan
- SRP – System Restoration Plan
- GC – Grid Code
- PSRP – Power System Restoration Plan
- PGM – Power Generating Module
- PPM – Power Park Module
- DSU – Demand Side Unit
- AGU – Aggregated Generating Unit
- OCGT – Open Cycle Gas Turbine
- DRSP – Demand Response Service Provider
- LFDD – Low Frequency Demand Disconnection
- OFGS – Over Frequency Generation Shedding
- UVLS – Under Voltage Load Shedding
- SPS – Special Protection Schemes
- RR – Replacement Reserve
- FRR – Frequency Restoration Reserve (TOR – Tertiary Operating Reserve)

2. Purpose

This Test Plan is prepared 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), which came into force on the 18th of December 2017. Under NCER the Transmission System Operator (TSO) of a member state is required to develop and consult on a Test Plan prior to submission to the relevant regulatory authority for approval.

This Test Plan has been designed based on the requirements detailed within Articles 43 and 44 to 47 within NCER, the high-level requirements of these articles include:

- Design of the Test Plan
- Assessment and identification of equipment and capabilities to be tested
- Periodicity and conditions of the test

In addition to the Test Plan providing a review of the System Defence Plan and System Restoration Plan actions and measures available to EirGrid as the TSO and ESB Networks as the Distribution System Operator (DSO); it also outlines the roles and responsibilities of Significant Grid Users (SGUs) including defence and restoration service providers in ensuring the full availability of their equipment and capabilities.

This document also outlines how the Test Plan that is implemented within the EirGrid TSO controlled area of Ireland, relates to the relevant articles of NCER and the Grid Code as necessary.

This is not an operational document to be used by the TSO in the event a defence or restoration service provider requires to be tested. The step by step actions used by EirGrid in the National Control Centre (NCC) or at the facilities site, or by ESB Networks are bespoke operational procedures to the provider/service being tested. While the NCER requirements and licence requirements for capability testing are jurisdictional the aim is to ensure the all-island system is maintained and operated in a secure manner, hence there is a separate but complementary Northern Ireland Test Plan which SONI has developed.

3. Introduction

There are various statutory obligations to which a Transmission System Operator (TSO) must adhere. Within European member states TSOs must adhere to and fulfil the requirements of European directives; which are implemented through applicable codes and guidelines. To which, some of the requirements are approved by the countries regulating authority before implementation.

NCER[2] is one of a suite of European Network Codes and Guidelines that seek to achieve a fully functioning and interconnected energy market, whilst ensuring the security of supply and that all consumers benefit via competitive markets across the EU.

The NCER aims to establish a set of common minimum requirements and principles for the measures and procedures; such as system defence and system restoration, to which TSOs, DSOs and SGUs must adhere to prevent the system from entering Emergency and/or Blackout state or to restore the system to Normal state from the Restoration state.

The NCER sets out the minimum (EU) legal obligation for emergency preparedness. Measures and procedures beyond those required by the NCER are not detailed within this report. For the avoidance of doubt, further defence and restoration measures are necessary and have been implemented by the TSO. Such measures will continue to be developed and implemented as the transmission system evolves in line with our strategy and licence obligations.

Also note that NCER links and interacts with a number of other European Network Guidelines and Codes, including but not limited to:

- System Operation Guideline (SOGL), EU Regulation 2017/1485[3]
- Requirements for Generators (RfG), EU Regulation 2016/631[4]
- High Voltage Direct Current (HVDC), EU regulation 2016/1447[5]

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R2196&from=en

[3] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R1485&from=EN

[4] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0631&from=EN

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R1447&from=EN

- Demand Connection Code (DCC), EU Regulation 2016/1388[6]
- Capacity Allocation and Congestion Management, EU Regulation 2015/1222[7]

EU network guidelines and codes supersede national legislation and have primacy over national and other regulations. Specifically, the design of this Test Plan is compiled in accordance with NCER Article 43 and is consulted upon in accordance with Article 7.

[6] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R1388&from=EN

[7] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015R1222&from=EN

4. Design of the Test Plan

In accordance with NCER Article 43 and Article 7 (Public consultation), the TSO of a member state is required to define and consult with the Distribution System Operator (DSO), Significant Grid Users (SGUs), defence and restoration service providers, on a test plan for system defence and system restoration prior to submission to the relevant regulatory authority for approval.

This Test Plan has been designed based on the requirements detailed within Articles 11, 23 and 43 to 47 within NCER, the high-level requirements of these articles include;

- Applicable parties of the Test Plan (Articles 11, 23 and 43)
- Design of the Test Plan (Article 43)
- Compliance testing and periodicity (Articles 43 to 47)

The purpose of this Test Plan is to state how it is implemented in Ireland, in addition to relating the relevant articles of NCER with documentation such as the System Defence Plan (SDP)[8], System Restoration Plan (SRP)[9] and the Grid Code (GC)[10].

Both the SDP and SRP are referenced in this Test Plan and should be considered as complimentary documents. In a similar approach to the other plans this Test Plan is reviewing existing procedures and no significant new processes are being implemented. Where there is a proposed minor amendment to ensure full compliance this is made clear.

In addition, should the detailed plans referenced in this document be altered to take into account the characteristics of the transmission system or underlying DSO systems, due to the behaviour and capabilities of load and generation within the TSO controlled area; then this alteration will be in accordance with the NCER Articles and shall be reflected in

[8] https://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid_System_Defence_Plan_Proposal_Ireland.pdf

[9] https://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid_System_Restoration_Plan_Ireland.pdf

[10] http://www.eirgridgroup.com/site-files/library/EirGrid/Grid-Code.pdf

a revised version of this document. Periodic reviews of both the SDP and SRP shall take place at least every 5 years in accordance with NCER Articles 50 and 51. This document will be reviewed following the SDP and SRP reviews and updated if necessary.

5. Requirements of the Test Plan

NCER Article 43 article defines the general principles to which the test plan must adhere to, including relevant articles (44 to 47) of NCER. For ease of reference Article 43 has been repeated in full below together with any references to other EU regulations again copied in full.

ARTICLE SUBSECTION	REQUIREMENT
43(1)	Each TSO shall periodically assess the proper functioning of all equipment and capabilities considered in the system defence plan and the restoration plan. To this end, each TSO shall periodically verify the compliance of such equipment and capabilities, in accordance with paragraph 2 and with **Article 41(2) of Regulation (EU) 2016/631(RfG):** "*2. The relevant system operator shall have the right to request that the power-generating facility owner carry out compliance tests and simulations according to a repeat plan or general scheme or after any failure, modification or replacement of any equipment that may have an impact on the power-generating module's compliance with the requirements of this Regulation. The power-generating facility owner shall be informed of the outcome of those compliance tests and simulations."* **, Article 35(2) of Regulation (EU) 2016/1388(DCC):** *"2. The relevant system operator shall have the right to request that the demand facility owner, the DSO or the CDSO carries out compliance tests and simulations according to a repeat plan or general scheme or after any failure, modification or replacement of any equipment that may have an impact on the compliance of the transmission connected demand facility, the transmission-connected distribution facility, the distribution system, or the demand unit with the requirements of this Regulation. The demand facility owner, the DSO or the CDSO shall be informed of the outcome of those compliance tests and simulations."* and **Article 69(1) and (2) of Regulation (EU) 2016/1447(HVDC):** *"1. The HVDC system owner shall ensure that the HVDC system and HVDC converter stations are compliant with the requirements provided for by this Regulation. This compliance*

ARTICLE SUBSECTION	REQUIREMENT
	shall be maintained throughout the lifetime of the facility. *2. The DC-connected power park module owner shall ensure that the DC-connected power park module is compliant with the requirements under this Regulation. This compliance shall be maintained throughout the lifetime of the facility."*
43(2)	By 18 December 2019 each TSO shall define a test plan in consultation with the DSOs, the SGUs identified pursuant to **Articles 11(4):** *"4. In particular, the system defence plan shall include the following elements: (only relevant section(c) shown)* *(c) a list of the SGUs responsible for implementing on their installations the measures that result from the mandatory requirements set out in Regulation (EU) 2016/631(RfG), (EU) 2016/1388 (DCC) and (EU) 2016/1447 (HVDC) or from national legislation and a list of the measures to be implemented by those SGUs; "* and **23(4):** "4*. In particular, the restoration plan shall include the following elements: (only relevant section(c) shown)* *(c) a list of the SGUs responsible for implementing on their installations the measures that result from mandatory requirements set out in Regulations (EU) 2016/631(RfG), (EU) 2016/1388 (DCC) and (EU) 2016/1447 (HVDC) or from national legislation and a list of the measures to be implemented by those SGUs; ."* The test plan shall identify the equipment and capabilities relevant for the system defence plan and the restoration plan that have to be tested.
43(3)	The test plan shall include the periodicity and conditions of the tests, following the minimum requirements outlined in Articles 44 to 47. The test plan shall follow the methodology laid down in Regulation (EU) 2016/631 (RfG), Regulation (EU) 2016/1388 (DCC) and Regulation (EU) 2016/1447 (HVDC) for the corresponding tested capability. For SGUs that are not subject to Regulation (EU) 2016/631 (RfG), Regulation (EU) 2016/1388 (DCC) and Regulation (EU) 2016/1447

ARTICLE SUBSECTION	REQUIREMENT
	(HVDC), the test plan shall follow the provisions of national law.
43(4)	Each TSO, DSO, SGU, defence service provider and restoration service provider shall not endanger the operational security of the transmission system and of the interconnected transmission system during the test. The test shall be conducted in a way that minimises the impact on system users.
43(5)	The test is deemed to be successful when it fulfils the conditions established by the relevant system operator pursuant to paragraph 3. As long as a test fails to fulfil these criteria, the TSO, DSO, SGU, defence service provider and restoration service provider shall repeat the test.

Commentary on Article 43

The general principles in Article 43, once enacted, may be described as providing reassurance that the defence and restoration measures listed in the SDP and the SRP, respectively, will be available to be utilised as when required by the TSO.

To ensure the proper functioning of the service provider's capabilities, the TSO shall periodically carry out an assessment to ensure as far practicable that the service will operate correctly and within the defined time-frame when called upon. This is set out in the Test Plan by confirming which measures in the SDP and SRP are tested.

In developing the Test Plan, any testing and monitoring procedures which may be provided by relevant service providers, EirGrid has co-ordinated and consulted with the DSO on the production of this document to ensure the following NCER principles are met:

- testing shall not endanger the operational security of the system
- testing shall be conducted to minimise the impact on system users

As noted in Article 43(2), other stakeholders including the SGUs identified and both defence and restoration service providers are to be consulted by the TSO. The

consultation exercise in accordance with Article 7(1) fulfils EirGrid's obligations in this respect.

It should be noted that some services are mandatory in other EU Regulations including the demonstration of compliance testing and simulations on request of the relevant system operator, whereas the EU Regulations for new HVDC owners mandates certain capabilities of HVDC facilities as the lifetime responsibility of HVDC owners without the need for ongoing compliance testing.

Overall the testing has due regard to that state of the system during any testing and should be planned to minimise the impact on users and the system. It is important to note that a significant majority of the tests have been established in the national code (Grid Code compliance tests and System Services compliance testing) for many years and have been operating successfully.

The next section will consider each measure of the SRP and SDP in turn and the aspects being tested including how often or when the tests should be carried out. It also includes an assessment of existing practices against compliance with NCER and wherever compliance is demonstrated EirGrid is not proposing to make any changes.

5.1. Application of the Test Plan – System Restoration Plan

5.1.1. Black Start

Within the SRP there is one main service identified and that is the Black Start Service provided by six power stations and the East-West Interconnector across the EirGrid TSO area.

Black Start capability means the capability to recover a power-generating module (PGM) from a total shutdown through a dedicated auxiliary power source without any electrical energy supply external to the power-generating facility (RfG Article 2(45) refers) and for a PGM to successfully demonstrate this technical capability, it shall start from shut down without any external electrical energy supply with the test deemed successful if the start-up time is kept within the time frame defined by the relevant TSO (RfG Article 45(5) refers).

The Black start service capability and testing has been present in the EirGrid Grid Code (OC.1.5.7, refers) for many years and is fully aligned with RfG. All Black Start service providers have an Ancillary Services (now System Services) agreement with EirGrid where payments are made for Black Start capability and availability. Conversely there is a Black Start charge on the provider for when the unit is tested and unable to demonstrate the capability within 60 minutes. There are two increasing rates; a partial Black Start Failure for start-up between 60 minutes and 120 minutes or a Total Black Start failure for not starting up within 120 minutes.

EirGrid plans to conduct a local Black Start test (aka: Black Start Unit Test as defined in the Grid Code) at each power station per year which is aligned with current Grid Code requirements of testing no more frequently than once in a calendar year. However, NCER introduces an enhanced testing frequency (or periodicity) in Article 44(1) of conducting a Black Start test per PGM of at least every three years.

To ensure full alignment with NCER, a Grid Code Amendment MPID:288[11], will shortly introduce the requirement for Black Start testing at least every three years for each PGM. This will impact power stations for example that have four Black Start units by increasing the testing frequency from a four year cycle to three years.

The update to the periodicity of testing is the only change proposed by EirGrid for testing Black Start capability. Once this is made, EirGrid believes this will not only fulfil the minimum obligations of NCER but ensures the robustness of the SRP if enacted.

HVDC Interconnectors with Black Start capability provide a similar service to Black Start power stations as it allows a healthy neighbouring power system to be the external power source. An HVDC owner demonstrates Black Start capability by energising the busbar of a remote AC substation within a time frame set by the TSO. The start-up time frame is set at 60 minutes for the first 50MW block of load.

NCER Article 46, Compliance Testing of HVDC capabilities, introduces the same periodicity requirement of at least every three years. The same Grid Code amendment mentioned above includes updated references to Interconnector Operators to provide full compliance.

5.1.2. Quick Resynchronisation

While only briefly mentioned in the SRP, RfG requires generation units with start-up times greater than 15 minutes, to be capable of tripping to house load when supply from the transmission system is lost. This is in order to enable these units to carry out quick resynchronisation when supply from the transmission system is restored. A similar requirement exists within the Grid Code for non-RfG units, where their start up time exceeds 30 minutes. Please see Grid Code CC.7.3.2 and RfG and non-RfG definitions for more detail.

[11] https://www.eirgridgroup.com/site-files/library/EirGrid/IrelandGCRP_3November2020.zip

The methodology for this quick resynchronisation service, (RfG Article 45(6), refers) describes that for a PGM to demonstrate the capability it is required to trip and stably operate on house load followed by a successful re-synch to the network, i.e. the unit remains operational on auxiliaries in order to provide a quicker resynchronisation time than had it been left fully disconnected to go 'cold'. The time period for quick re-synchronisation will be specified by the relevant system operator for all RfG and non-RfG units.

There are currently no RfG generation units with a start-up time greater than 15 minutes in the EirGrid TSO controlled area, however, in anticipation for when applicable generation does commission onto the system there are revised compliance tests including 'RfG Trip to House Load' on the EirGrid compliance testing website.[12]

Therefore EirGrid is currently compliant and fully aligned with RfG, however NCER Article 44(2) introduces a periodicity element to when these tests will be required to be performed subsequent to commissioning. Rather than a set time-period, re-tests will be required based on certain events occurring, such as changes to equipment impacting house load operation or after two unsuccessful consecutive tripping in real operation (not testing). These requirements will be made clear to the generator owner during the connection application stage as part of the demonstration of full compliance required to successfully commission onto the system.

5.2. Application of the Test Plan – System Defence Plan

Within the SDP there are a number of measures employed to mitigate the operational impact on the system as it moves into an Emergency system state, some of the actions may be deployed to support more than a single operational effect, e.g. dispatching active power for power flow, voltage or frequency issues.

[12] https://www.eirgridgroup.com/customer-and-industry/general-customer-information/grid-code-compliance-test/compliance-testing/conventional-generation/

In the following section the individual actions and capabilities delivered by service providers have been considered irrespective of the measures it is listed against in the SDP.

5.2.1. Automatic Tripping Schemes

Low Frequency Demand Disconnection (LFDD)

One of the main automatic tripping schemes is LFDD where low frequency relays on individual feeders at substations within the distribution system are set at various frequency thresholds to stagger the demand disconnected depending on the severity of the low frequency incident. The stages of the scheme are listed in the SDP.

There is ongoing co-ordination between EirGrid and ESB Networks to ensure the successful operation and maintenance of this scheme. All the low frequency relays are owned and maintained by ESB Networks, however, EirGrid is responsible for specifying the load allocated to each of the low frequency tripping blocks and for ensuring overall co-ordination with SONI for the synchronous area.

There is currently a joint project between EirGrid and ESB Networks reviewing the overall strategy with regard to the fleet of relays and equipment involved. This has the objective of providing a rolling 5 year programme of testing for the relays (approx. 700+) including a review of functionality, a programme of maintenance and replacement as necessary.

Over Frequency Generation Shedding Scheme (OFGS) and Under Voltage Load Shedding (UVLS)

In a similar way to the LFDD scheme above, the OFGS and UVLS rely on various staggered settings of over frequency or under voltage relays respectively to operate the protection and trip the relevant generators.

EirGrid as TSO is responsible for these schemes and the maintenance policy. The schemes are part of the TSO / generator interface and the policy is for these relays to be maintenance tested every 5 years.

Special Protection Schemes (SPS)

The special protection schemes are designed to protect the system from excessive power flow and there are only a small number on the system. They are integrated within the main TSO-controlled protection schemes or realised as dedicated TSO SPS relays. As above, the testing policy is that they are all tested every 5 years under the regular protection maintenance testing cycle.

Step Wise Linear Disconnection

The SDP makes reference to Step Wise Linear Disconnection if the over-frequency control is insufficient to manage the loss of the largest export, in accordance with NCER. However, as the OFGS is designed to manage this there is not a TSO instructed scheme or any testing requirements.

5.2.2. Operating Reserve

Frequency Restoration Reserve (FRR)

It was discussed in the SDP that FRR may be categorised as a defence service due to the timing of when the service is provided compared to the declaration of an emergency system state.

EirGrid publishes the 'DS3 System Services Protocol'[13] to describe the testing and monitoring of Tertiary Operating Reserve (maps to FRR). If there is a 'frequency event' as defined for performance monitoring (+/- 0.3Hz from a nominal 50.0Hz), all operating reserve providers are monitored and assessed as a pass, partial pass or fail. The DS3 agreement has significant financial incentives to maintain compliance, otherwise

[13] http://www.eirgridgroup.com/site-files/library/EirGrid/DS3-System-Services-Protocol-Regulated-Arrangements-v2.0.pdf

performance scalars are applied to the payments received by service providers. Given the above criteria, monitoring occurs multiple times each year, for example there have been at seven frequency events during 2020.

Any units that implement any equipment changes that impact their frequency characteristics will trigger a re-test as per the commissioning tests validated by EirGrid.

Replacement Reserve (RR)

RR testing in response to a frequency event follows the testing outlined above. However, if tested against response to a dispatch instruction and if fails to synch within 15 minutes, the unit is given a Failure to Follow Notice to Synchronise (GC SDC2.A.4 & DS3 System Services Protocol) which overrides all normal market rules and eliminates any payment against that synchronisation instruction.

Turlough Hill

While Turlough Hill has low frequency relays to initiate either a pump to trip or a generator to start up it is paid as an operational reserve service and contract. Thus, its testing and monitoring is based on that contract rather than an Automatic Tripping Scheme (section 5.1).

Therefore, monitoring is carried out every time the frequency goes below 49.7Hz as long as there is a unit in service at the time. Of the 7 frequency events of 2020, Turlough Hill's units have been monitored in all of them with at least two of the four units monitored for each event.

Any maintenance testing on the relays is the responsibility of the generator owner, who is incentivised to keep the scheme fully functional with the risk of a performance scalar being applied if it fails.

5.2.3. Central Dispatch Instructions

Active Power Set Points

Asking a dispatchable unit to change their active power set point is tested regularly through daily instructions in the market, however, EirGrid does not carry out monitoring unless there is a specific issue brought to its attention. Also, it should be noted that if generation units are not following their active power instructions they will be out of balance in the market and will be impacted financially.

As part of DS3 System Services there are a number of ramping products and some of these are performance monitored based on their instructions to synchronise (and their monthly payments are adjusted by performance scalars accordingly based on pass / fail criteria).

For those units that do not receive regular dispatch instructions, EirGrid has an "Availability Testing Policy" where all dispatchable units that have been off load for more than 12 weeks are issued with a synchronisation dispatch instruction at an opportune time and dispatched to their declared availability. This is carried out as soon as practicable taking into account the balance between incurring additional imperfection costs and maintaining system security. For peaking units, OCGTs, and AGU's the requirement to test is reduced to every 6 weeks.

For thermal, DSU, and AGU units if the declared availability is not achieved and maintained for 60 minutes the test should be logged as 'failed'. For energy limited plant (e.g. hydro, pumped storage, batteries etc.), it is sufficient to achieve full load for the test to be logged as 'passed'.

Reactive Power Set Points

Generating units providing a minimum reactive power capability is mandated in the Grid Code and compliance checked during their initial commissioning tests. Subsequently there is no regular monitoring unless EirGrid becomes aware of an issue with a particular unit.

Units may apply to receive Steady State Reactive Power (SSRP) payments under DS3 System Services, however, these are not actively performance monitored and there is no performance scalars (say similar to Operating Reserves) applied to act as an incentive to maintain compliance. So once a Unit receives this contract they will receive monthly payments based on their availability.

Demand Response Service Provider (DRSP)

As noted in the SDP demand side response has been provided for many years by Demand Side Units (DSUs) as defined in the Grid Code. Moreover, when considering the requirements in DCC for DRSPs, the main demand response service is categorised as Remote Controlled – Active Power Control (RC-APC).

RC-APC is covered by DCC Article 28 which describes the characteristics of the demand response to be agreed with the TSO, which can be made the same as DS3 Ramping Services for demand providers. Currently, only DSUs have the 'proven technology' to provide this service.[14]

Therefore, while DSUs are a subset of the wider network codes definition of DRSPs, when assessing compliance against NCER Article 45 (1) this is applicable to DSUs only. The NCER requirement is to perform a 'demand modification test' at least every year, which is equivalent to following a dispatch instruction (to provide demand response for a set duration and then return to normal operation, again on instruction).

DSUs are checked for compliance on connection and for providing DS3 System Services prior to the award of an agreement. Once in service the 'Availability Testing Policy' is followed where DSUs receive a dispatch instruction approximately every 12 weeks unless prohibitively expensive (note: monitoring is for information only as DSUs are paid based on dispatch instruction and not their metered output). Therefore, as costs are taken into account under the current policy, EirGrid is proposing to update it to include at

[14] https://www.eirgridgroup.com/site-files/library/EirGrid/SS-Guidance-document.pdf

least one dispatch instruction in a 12 month period, to ensure compliance with the periodicity criteria.

5.2.4. Manual Tripping Schemes

Disconnection on Instruction (Generation and Demand)

All centrally dispatched generators or demand units may receive an instruction to be dispatched to zero MWs following normal dynamic parameters. Testing the receiving of normal dispatch instructions for active power changes is discussed above.

While tripping of units is not usually a planned event, conventional (synchronous) generator units are tested during commissioning with a full – load rejection test where the main high voltage circuit breaker is opened to trip the unit, however, this is to check the units for stability and minimum recovery time.

Load Shedding (Demand Disconnection)

ESB Networks has up to 800MW of demand selectable for manual load shedding in set blocks of typically 50MW tranches in order to react efficiently to any request for demand control from EirGrid.

ESB Networks' 'Approved Emergency Load Shedding Plans' are created in SCADA integrated software and are ready to be run automatically if required, i.e. by initiating a single instruction multiple circuit breakers will open to disconnect a set amount of demand. The system is set up in tranches so each instruction initiates approximately 50MW of load reduction in staggered north/south groupings up to maximum of 400MW per plan (there are two plans: a 5 minute plan and a 30 minute plan – see SDP for details)

The Approved Emergency Load Shedding Plans are tested quarterly by executing them in SCADA 'study (offline) mode' to ensure that the plans run successfully but without any load shedding and that Control Room Operators are familiar with the process. Circuit breaker maintenance testing is also carried out to a standard schedule.

EirGrid and ESB Networks periodically review the volume of demand available for disconnection as part of continued improvements to the Load Shedding Plan.

5.2.5. Interconnectors

Emergency Assistance

The emergency assistance requirement is part of the standing arrangement in the Interconnector Operating Protocol (IOP) agreed with both relevant system operators. The obligation is mutual and cannot be removed unless the sending TSO would enter Emergency or Blackout state by providing Emergency Assistance (NCER Article 14 (1)) or an Emergency Instruction is issued to cancel the Emergency Assistance.

Testing of this service is not required (and not needed for compliance with NCER) as ramping the interconnector involves normal actions that are available as long as the interconnector is in service.

5.3. Compliance with NCER Article 44 to 47

While the above sections have considered the testing of all actions and measures in the SDP and SRP, some are set at the commissioning stage and then tested at regular intervals and some only when EirGrid has cause for concern; the following table reviews the overall Test Plan against the specific requirements of NCER Article 44 to 47.

Article Subsection	Requirement	Summary of Compliance
44 (1) – Compliance testing of power generating module capabilities	*Each restoration service provider which is a power generating module delivering black start service shall execute a black start capability test, at least every three years, following the methodology laid down in Article 45(5) of Regulation (EU) 2016/631.*	As discussed in section 5.1.1 above and while the obligation is on the restoration service provider, EirGrid pro-actively monitors the Black Start tests and is updating the Grid Code to comply with the periodicity requirements of at least every three years.

Article Subsection	Requirement	Summary of Compliance
44(2) – Compliance testing of power generating module capabilities	*Each restoration service provider which is a power generating module delivering a quick re-synchronisation service shall execute tripping to house load test after any changes of equipment having an impact on its house load operation capability, or after two unsuccessful consecutive tripping in real operation, following the methodology laid down in Article 45(6) of Regulation (EU) 2016/631.*	As discussed in section 5.1.2 above, there are not any RfG Generating Units in the EirGrid controlled area that are mandated to provide a quick resynchronisation service. However, while the obligation is with the restoration service provider, EirGrid has issued a 'tripping to house load test' on their testing website if required in the future.
45 (1) – Compliance testing of demand facilities providing demand side response	*Each defence service provider delivering demand response shall execute a demand modification test, after two consecutive unsuccessful responses in real operation or at least every year, following the methodology laid down in Article 41(1) of Regulation (EU) 2016/1388.*	As discussed in section 5.2.3 above, the only Demand Response Service Providers in EirGrid's TSO area are currently Demand Side Units as defined in the Grid Code. As a demand modification test is essentially adjusting their active power in response to a TSO instruction, DSU owners exceed the minimum requirements for periodicity.

Article Subsection	Requirement	Summary of Compliance
45 (2) – Compliance testing of demand facilities providing demand side response	*Each defence service provider delivering demand response low frequency demand disconnection shall execute a low frequency demand disconnection test within a period to be defined at national level and following the methodology laid down in Article 37(4) of Regulation (EU) 2016/1388 for transmission connected demand facilities or according to a similar methodology defined by the relevant system operator for other demand facilities*	As noted in the SDP there is currently not any transmission connected demand providing a low frequency demand disconnection service in EirGrid's TSO area. Therefore, no requirements for testing have been included. However, if this changes in the future then EirGrid will bring forward a Test Plan to enable the defence service provider to meet their obligation and comply with NCER including specifying a time limit for disconnection.
46 – Compliance testing of HVDC capabilities	*Each restoration service provider which is an HVDC system delivering a black start service shall execute a black start capability test, at least every three years, following the methodology laid down in Article 71(11) of Regulation (EU) 2016/1447.*	As discussed in section 5.1.1 above and while the obligation is on the restoration service provider EirGrid pro-actively monitors the Black Start tests and is updating the Grid Code to comply with the periodicity requirements of at least every three years.

Article Subsection	Requirement	Summary of Compliance
47 – Compliance testing of low frequency demand disconnection relays	*Each DSO and TSO shall execute testing on the low frequency demand disconnection relays implemented on its installations, within a period to be defined at national level and following the methodology laid down in Article 37(6) and Article 39(5) of Regulation (EU) 2016/1388.*	All low frequency relays in the LFDD scheme are owned by ESB Networks and are their responsibility to maintain and test for functionality. EirGrid's role is to ensure the overall scheme operates correctly at each frequency step by specifying the settings and confirming a fair distribution of demand lost across the whole synchronous area with SONI and ensuring compliance with NCER. There is currently a joint project between EirGrid and ESB Networks reviewing the overall strategy with regard to the fleet of relays and equipment involved. This has the objective of providing a rolling 5 year programme of testing for the relays (approx. 700+) including a review of functionality, a programme of maintenance and replacement as necessary.

Table 1 – Summary of Compliance against NCER Articles 44 to 47

6. Next Steps

This concludes EirGrid's submission to the Commission for Regulation of Utilities of the proposal for Design of Test Plan for Ireland in accordance with the requirements of Articles 43 and 44 to 47 of the Commission Regulation (EU) 2017/2196 establishing a network code on electricity emergency and restoration of the Commission Regulation (EU).