



Department for  
Business, Energy  
& Industrial Strategy

# Risk Preparedness Plan for the Electricity Sector in Northern Ireland



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# Glossary and Abbreviations

ASP	Administered and Reserve Scarcity Pricing
BEIS	Department for Business, Energy and Industrial Strategy
BM	Balancing Market
CA	Competent Authority
CCGNI	Civil Contingencies Group Northern Ireland
CPNI	Centre for the Protection of National Infrastructure
CRU	Commission for Regulation of Utilities (ROI)
DECC	Department of Environment, Climate and Communications (ROI)
DfE	Department for the Economy
DIM	Duty Incident Manager
DIT	Duty Incident Team
DNO	Distribution Network Operator
DoF	Department of Finance
DSR	Demand Side Responder
EAS	European Awareness System
ECG	Electricity Coordination Group
EENS	Expected Energy Not Served
Eirgrid	ROI System Operator
EMS	Energy Management System
ENTSO-E	European Network of Transmission System Operators for Electricity
ESEC(NI)	Electricity Supply Emergency Code (NI)
EU	European Union
EWIC	East West Interconnector
FSC	Fuel Security Code
GB	Great Britain
HVDC	High Voltage Direct Current
LGD	Lead Government Department

LIC	Local Incident Centre
LOLE	Loss of Load Expectation
MI	Moyle Interconnector
MO	Market Operator
MP	Market Participant
NCER	Network Code Electricity Emergency and Restoration (EU Regulation) 2017/2196
NCSC	National Cyber Security Centre
NEWSAC	North Eastern, Southern and Western Area Agreement
NGET	National Grid Electricity Transmission
NIAUR	Northern Ireland Authority for Utility Regulation
NIEN	Northern Ireland Electricity Networks
NIJRT	Northern Ireland Joint Response Team
NIS	Network and Information Systems
OES	Operator of Essential Services
PSECP	Power System Emergency Communications Plan
PSL	Protected Sites List
PSRP	Power System Restoration Plan
RPP	Risk Preparedness Plan
RPR	Risk Preparedness (EU Regulation) 2019/941
ROI	Republic of Ireland
SDP	System Defence Plan
SEM	Single Electricity Market
SEMO	Single Electricity Market Operator
SGU	Significant Grid User
SOGL	System Operation Guideline (EU Regulation) 2017/1485
SONI	System Operator for Northern Ireland
TSO	Transmission System Operator
UK	United Kingdom

# General Information

This Risk Preparedness Plan has been developed in accordance with the requirements of Article 10 of [Regulation 2019/941](#) of the European Parliament and of the Council of 5<sup>th</sup> June 2019 on Risk Preparedness in the Electricity Sector (**RPR**). It has been developed by the Department for Business, Energy and Industrial Strategy (**BEIS**), the designated Competent Authority (**CA**) for the United Kingdom (**UK**) on behalf of Northern Ireland.

Following its exit from the European Union (**EU**), RPR continues to apply to the UK in respect of Northern Ireland (**NI**)<sup>1</sup>, pursuant to the [Withdrawal Agreement](#) between UK Government and the EU.

A synchronous system and Single Electricity Market (**SEM**) is in operation across the two jurisdictions on the island of Ireland – Northern Ireland and the Republic of Ireland (**ROI**).

## Risk Preparedness Regulation

The RPR complements a suite of European and domestic legislation that ensures the effective operation of electricity systems, interconnected markets and security of supply. It lays down rules for cooperation between Member States with a view to preventing, preparing for and managing electricity crises in a spirit of solidarity and transparency and in full regard for the requirements of a competitive internal market for electricity. It introduces common provisions for risk assessment, risk preparedness plans, managing electricity crises, evaluation and monitoring amongst Member States. It also requires that each Member State identifies and assesses national electricity crisis scenarios. These scenarios focus on large scale, large impact events such as extreme weather situations or malicious attack that may significantly disrupt electricity supply to customers and lead to subsequent impacts on cross border electricity flows. Each Member State is required to produce a Risk Preparedness Plan (**RPP**)

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<sup>1</sup> Following UK's exit from EU, GB introduced a Statutory Instrument (SI) to amend the Regulation as it has effect as retained EU law in GB. The RPR (2019/941) continues to apply to the UK in respect of NI, as direct EU law.

highlighting the national mitigation measures that exist to prevent, prepare for and manage an electricity crisis and to highlight the agreed mechanisms that exist to ensure regional / bilateral cooperation and assistance in the event of a crisis.

## Risk Preparedness Plan

This RPP has been developed by BEIS, as the designated CA for the UK on behalf of NI. BEIS delegated operational tasks<sup>2</sup> to the Department for the Economy (**DfE**). DfE has devolved responsibility for the electricity sector in NI which is regulated by the Northern Ireland Authority for Utility Regulation (**NIAUR**).

In preparing the document, consultation was undertaken with ROI through the Government Department of Environment Climate and Communications (**DECC**) and the designated Competent Authority, Commission for Regulation of Utilities (**CRU**). This is due to the operation of the SEM on the island of Ireland and pursuant to Articles 12 and 15 of the RPR.

The RPP has been developed following the identification and assessment of national electricity crisis scenarios. It provides a summary of the mitigation measures that are in place in NI to prevent, prepare for and manage an electricity crisis as well as bilateral / regional cooperation measures to ensure system security in the event of an electricity emergency.

## The Transmission and Distribution System

A synchronous system is in operation across the two jurisdictions on the island of Ireland. Connections include:

- 275kV double circuit line, which operates in stand-by mode
- Two 500MW High Voltage Direct Current (**HVDC**) cables. The Moyle Interconnector connects NI with Scotland (GB) and the East West Interconnector (EWIC) connects ROI with Wales (GB)

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<sup>2</sup> In accordance with RPR Article 3(3) and 11(1b)

- North South Interconnector –a proposed 400kV connection between NI and ROI is currently subject to planning permission and subsequent consent procedures
- Two further HVDC interconnector projects are currently underway in ROI – the Greenlink Interconnector<sup>3</sup> and the Celtic Interconnector<sup>4</sup>.

In NI, the transmission and distribution infrastructure is owned and managed by NIE Networks Ltd. (**NIEN**). NIEN also operate the distribution network. The transmission system is operated separately by the System Operator for Northern Ireland (**SONI**).

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<sup>3</sup> The Greenlink Interconnector (linking ROI and GB) is due to be commissioned in 2023, providing an additional 500MW.

<sup>4</sup> The Celtic Interconnector (linking ROI to Northern France) has an expected completion date of 2026, providing an additional 700MW.



# 1. Summary of National Crisis Scenarios

The national electricity crisis scenarios for NI were identified after consideration of the regional electricity crisis scenarios, as defined in the [ENTSO-E methodology](#)<sup>5</sup> and subsequent to a wider exercise which identified crisis scenarios relevant to the UK as a whole<sup>6</sup>.

Consultation of the crisis scenarios was undertaken with relevant stakeholders in NI including SONI, NIEN, NIAUR, Mutual Energy Limited (asset owners of the Moyle Electricity Interconnector), Coolkeeragh, Ballylumford and Kilroot Power Stations.

A total of 27 national crisis scenarios were identified as being applicable to the NI electricity sector. An assessment of the risk associated with these scenarios was carried out using the ENTSO-E methodology, pursuant to Article 6(1) (refer to Appendix 1). This assessment will be updated every four years, or more frequently if circumstances warrant, pursuant to Article 7(3).

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<sup>5</sup> The European Network of Transmission System Operators for Electricity (ENTSO-E) methodology was prepared in accordance with Article 5 of the RPR and provides the process for identification of the most relevant electricity crisis scenarios at regional level. The national competent authorities use the methodology and regional scenarios, in the identification of electricity crisis scenarios at national level.

<sup>6</sup> This exercise was carried out by BEIS in consultation with National Grid ESO, the electricity system operator in GB in December 2020.

## 2. Competent Authority Role & Responsibilities

The RPR requires the UK to nominate a Competent Authority for the purposes of carrying out the obligations provided for in the Regulation. The UK Secretary of State nominated BEIS in January 2020.

Following the UK's exit from the European Union (**EU**) it was agreed that BEIS would continue in its designated role as the Competent Authority for NI as the Regulation continues to apply to the UK in respect of NI, pursuant to the Withdrawal Agreement between UK Government and the EU.

### Responsibility of BEIS as Competent Authority

As the Competent Authority, BEIS is responsible for ensuring that all obligations of the RPR 2019/941 are fulfilled with respect to NI. This includes the development of the Risk Preparedness Plan.

### Tasks delegated to DfE-NI

As energy policy is devolved to the NI Executive, BEIS has delegated some operational tasks regarding risk-preparedness planning and risk management to the DfE in NI (in accordance with Article 3(3) and 11(1b) of the Risk Preparedness Regulation). The following delegated tasks were/ will be performed under the supervision of BEIS as Competent Authority.

- Identification of national electricity crisis scenarios for NI as per Article 7(1) and consultation with relevant stakeholders.
- Contribution towards the assessment of risks in relation to the ownership of NI infrastructure relevant for security of electricity supply as per Article 7(4).
- Operational input to the development of a RPP for NI, in accordance with the requirements set out in Articles 10 and 11 and consulting with the relevant

stakeholders.

- Operational input to periodic testing of the RPPs for their effectiveness as per Article 12(3).
- Operational input to the CA review and update of the RPP every 4 years, unless circumstances warrant more frequent updates.
- In the event of an electricity crisis, inform relevant stakeholders of the application of any non-market-based measures as per Article 16.

## Tasks to be carried out by BEIS

As Competent Authority, BEIS will:

- Review the output of the tasks delegated to DfE.
- Engage at Member State level with other Competent Authorities, the Electricity Coordination Group (**ECG**) and the EU as required.
- Finalise and submit the draft RPP to the Commission for consultation as per Article 10 (4).
- Adopt the final RPP by 5 January 2022 and publish on relevant websites (BEIS and DfE), as per Article 10(8), while ensuring confidentiality of sensitive information.

In the event of a potential or actual national electricity crisis in NI, DfE will invoke the agreed emergency protocol to ensure BEIS, as Competent Authority:

- Issues an early warning or declare an electricity crisis to the Commission and the Competent Authority of the ROI as per Article 14.
- Provides the ECG and the Commission with an ex-post evaluation report, after having consulted NIAUR as per Article 17 and if necessary, present these to the ECG.

## 3. Procedures and measures in the event of an electricity crisis

## 3.1 National procedures and measures

At the national level there is a range of legislation, policies and procedures that enable NI to sufficiently prevent, prepare for and mitigate the effects of an electricity crisis and to ensure that security of supply is maintained.

### 3.1 (a) Procedures to be followed in the event of a crisis

The occurrence of an electricity crisis in NI will trigger a response from various actors, depending on the severity and scale of the crisis. This includes:

- **Industry Response** - namely the TSOs, the DNO, the power generating stations, Significant Grid Users (**SGUs**) and the market operators (**MOs**).
- **NI Executive / Government Response** - namely the DfE as the relevant Government Department in the NI Executive, BEIS as the Competent Authority on behalf of NI and a wider Government response through the civil contingency framework.

In the event of an electricity crisis, it is agreed protocol that SONI will coordinate the emergency response in NI, alongside other energy industry actors and will liaise with DfE, which will act as a conduit between the energy industry and the UK Government to ensure appropriate protocols/ procedures are followed. Emergency response procedures include:

Procedure for Declaration of System Alerts (energy industry led)
System Defence Plan (energy industry led)
Power System Restoration Plan (energy industry led)
Electricity Order (NI) 1992 and Energy Act 1976 (NI Executive/Government led)

## ***Procedure for Declaration of System Alerts***

Regardless of the category of the crisis, the actions taken by SONI will be determined by the severity of the crisis. The [Procedure for Declaration of System Alerts](#) has been compiled in accordance with the System Operation Guideline (**SOGL**). SOGL system alert states update those previously used in Northern Ireland/ ROI. These are shown below and range from Normal, to Alert State (Amber), Emergency State (Red), Blackout (Blue) and Restoration State. For each of these states there are definitions or criteria that establish the state in which the system is.



The procedure is used by the control centres across jurisdictions in both NI and ROI in the event of a change in system state. It details the steps the control centres and the managers would take during an alert. It covers aspects such as:

- initial determination of change in system state;
- communication of the alert to relevant stakeholders;
- options available to restore the system to normal state.

When an Emergency state occurs a Red Alert is issued from SONI notifying all generating stations, key DNO personnel, relevant TSO staff, MOs and key external stakeholders including the NIAUR and DfE. Each stakeholder may be responsible for internal procedures in receipt of this alert. SONI will also update the European

Awareness System (**EAS**), which notifies other European TSOs that is in Emergency state. The System Defence Plan (**SDP**) is activated and once the system has over an hour of stable operation with a low risk of further alerts, then the Red Alert is cancelled and the TSO updates the EAS to Normal state and advises other stakeholders.

### ***System Defence Plan (SDP)***

The SDP provides information into how SONI and NIEN operate the system during an Emergency state in order to return to Normal state as soon as practicable.

The document was compiled pursuant to the provisions of NCER, and to other network codes, other relevant legal provisions as well as any relevant local legislation and licence conditions. It is intended to serve as an oversight document referencing the more detailed plans. The SDP requires specific 'measures' to be put in place when the system is in, or forecast to be imminently in, an Emergency state. These measures include automatic schemes and procedures:

- Automatic under-frequency control schemes
- Automatic over-frequency control schemes
- Automatic scheme against voltage collapse
- Frequency deviation management procedure
- Voltage deviation management procedure
- Power flow management procedure
- Assistance for active power procedure
- Manual demand disconnection procedure

### ***Power System Restoration Plan (PSRP)***

### ***Electricity Order (NI) 1992 and Energy Act 1976***

Under Article 58 of the Electricity Order (NI) 1992, the DfE *may* give directions to the DNO, the TSO and/or any Generator and any Supplier for the purpose of, "*mitigating*

*the effects of any civil emergency which may occur". A civil emergency is defined in the Order as "any natural disaster or other emergency which, in the opinion of the Department, is or may be likely to disrupt electricity supplies".*

Additionally, under the Energy Act 1976, the Secretary of State has powers to make orders and give directions controlling the production, supply, acquisition or use of electricity, where there is an actual or imminent emergency affecting electricity supplies.

## Communication flows during an electricity crisis

Various responses come into play during a crisis to ensure that communication protocols are followed and appropriate response actions are coordinated. These are set out in the NI Response Strategy to Gas and Electricity Supply Emergencies.

The following communication responses may be triggered:

### ***Power System Emergency Communications Plan (PSECP)***

The primary objective of this communication plan is to manage communications during an electricity emergency event. It sets out arrangements for SONI to share information during a power system blackout with key stakeholders. The focus of the plan is to alleviate concerns of the public/stakeholders and maintain confidence that SONI is addressing the situation. It involves activating the communications response via structured stakeholder meetings and working closely with the LGD, the NIAUR, Transmission Asset Owner and the Gas TSO. It ensures that messaging is coordinated, consistent and timely.

### ***DNO Emergency Incident Centre***

NIEN response to an electricity crisis is managed through its Distribution Control Centre. This runs on a 24/7 basis and will become the Emergency Incident Centre handling responses for any major disruption to the electricity network. The emergency incident team will control the response including communications and call handling.

### ***Multi Agency Emergency Response Group***

The Multi Agency Emergency Response Group consists of a number of key agencies including local government departments, local councils and bodies such as MET office PSNI, NI Water, Rivers Agency, NI Fire and Rescue Service, NIE Networks, Translink and Red Cross. It will convene in the event of an emergency and also in advance of weather warnings where for example, there is a risk of storms/flooding and respective agencies can share information and preparation for the event. It also enables all partners to provide necessary support for each other, via resource or joint communication messages for public awareness.

### ***The Northern Ireland Joint Response Team (NIJRT)***

The NIJRT forms part of the overall emergency framework for responding to a *major* gas and/or electricity incident in NI. It has a core representation from industry, NI Executive and other agencies (NINEC, Mutual Energy<sup>7</sup>, SONI, NIAUR, and Health & Safety Executive NI) and is led by the DfE. Other stakeholders will be invited as is deemed necessary. The aim of the NIJRT is to provide an essential link between industry and the NI Executive in a potential or actual emergency. It aims to:

- gather and analyse incident information
- develop options for responding to the emergency
- prepare briefing material
- ensure that appropriate emergency powers are taken, where necessary.

NIJRT response levels are clearly set out in the Strategy for Gas and Electricity Emergencies. Following an agreed NI Government alert warning system NIJRT will implement the following responses:

WHITE – no action required

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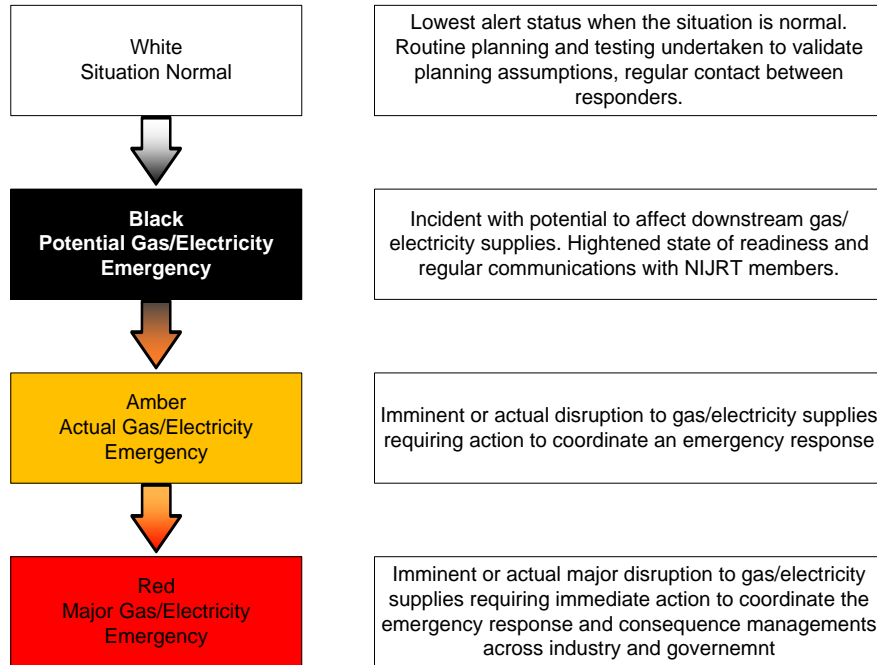
<sup>7</sup> Owner and operator of Moyle Interconnector



BLACK – NIJRT members contacted and monitoring stepped up

AMBER – NIJRT activated and meet as required

RED – NIJRT activated and meet on a daily basis



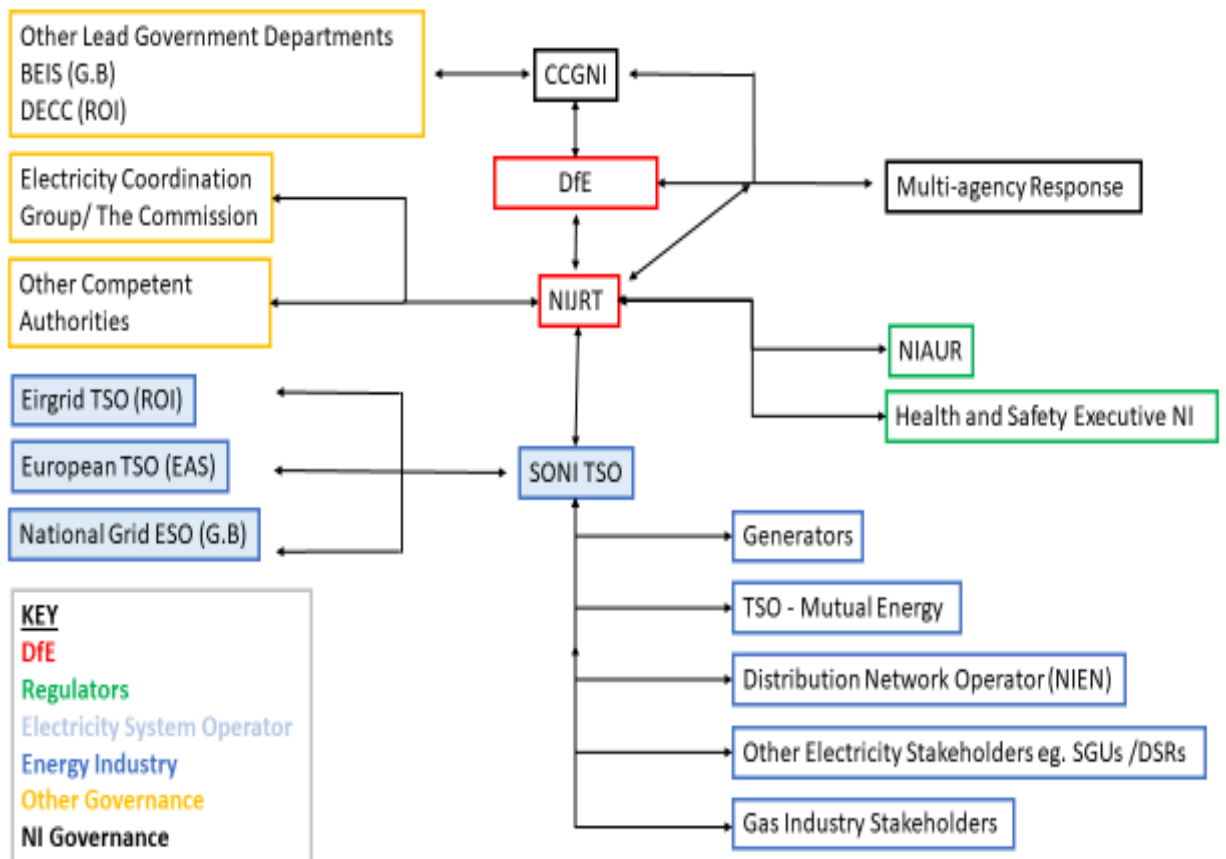
### The Civil Contingencies Group Northern Ireland (CCGNI)

CCGNI discharges the *strategic central coordination function* during emergency situations in NI<sup>8</sup>. It co-ordinates the response across the NI departments and other organisations such as the emergency services and district councils. It is chaired by the Head of the Northern Ireland Civil Service and the Secretary is the Head of the [Civil Contingencies Policy Branch](#), based in The Executive Office. When an emergency has occurred or is likely to occur the DfE can request that the CCG (NI), be convened to facilitate co-ordination of the response. The diagram below shows the process for dealing with civil contingencies (including an electricity crisis), the escalation of

<sup>8</sup> Civil contingency is largely a devolved matter in NI. The [Civil Contingencies Framework](#) ensures consistency with the rest of the UK and that obligations under the Civil Contingencies Act 2004 (Contingency Planning) and its accompanying Regulations (2012) are implemented.

authority and the relationships between the NI Executive, ROI Government and the UK Government.

**Diagram – Communications flows in the event of a potential / actual NI electricity emergency**



### 3.1(b) National Preventative and Preparatory Measures

The following section outlines the range of measures that exist to help prevent and prepare for an electricity crisis. These measures exist within the frameworks of legislation, licensing, within industry codes and standards as well as industry procedures.

#### **Legislation**

[The Security of Network and Information Systems Regulations \(NIS\)](#) came into force in NI on 10th May 2018. The regulations transposed an EU Directive<sup>9</sup>, designed to boost the overall level of security for the network and information systems that support the delivery of essential services, in sectors which are vital for the economy and society, including the supply of electricity. The Competent Authority and lead responsibility for NI is the Department of Finance (**DoF**). The regulations recommendations for minimum standards for cyber security controls will be achieved through self-assessments and assessments using the [National Cyber Security Centre's \(NCSC's\) Cyber Assessment Framework](#). Reporting requirements for cyber incidents are mandated and the DoF sets incident thresholds for the electricity sector, and operators must report any incident that reaches the threshold within 72 hours of the incident occurring. DoF must then advise the NCSC about any incident so that appropriate action can be taken in an effective, proportionate and timely way. There are currently over 30 operators of essential services (**OES**) in electricity sector in NI. These are companies that hold an electricity transmission, generation or supply licence (with over 8,000 customers).

#### **Network Codes**

The [Network Code on Electricity Emergency and Restoration Regulation \(EU\) 2017/2196 \(NCER\)](#) aims to establish a set of common minimum requirements and principles for the measures and procedures of TSOs, DNOs and SGUs when a power

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<sup>9</sup> The European Network and Information System Security Directive (NIS), was adopted by the European Parliament in July 2016 and came into force in August 2016, giving Member States 21 months to transpose it into their national laws.

system is in Emergency, Blackout or Restoration state. The NCER links and interacts with a number of other Network Codes, including but not limited to:

- System Operation Guideline (SOGL), EU Regulation 2017/1485
- Requirements for Generators (RfG), EU Regulation 2016/631
- High Voltage Direct Current (HVDC), EU regulation 2016/1447
- Demand Connection Code (DCC), EU Regulation 2016/1388

Requirements set out in the network codes have been implemented into the design of measures including the Alert System Procedure, the SDP and the PSRP.

### ***Grid Code / Distribution Code***

The [SONI Grid Code](#) details the main technical requirements to be met by users of the transmission system. It sets out the principles governing SONI's relationship with users and technical standards to be complied with by SONI and users specifying procedures for planning, connecting to and operating the transmission system during both normal and *exceptional* circumstances. The Operating Codes (**OC**) that are specific to emergency response are OC4 Demand Control and OC7 contingency planning.

The [Distribution Code](#) establishes the rules governing the operation, maintenance and development of the distribution system and sets out the procedures for governing the actions of all distribution system users. OC3 Demand Control and OC7 Contingency Planning relate specifically to emergency response.

Both the Grid Code and the Distribution Code are owned and maintained by Industry with changes approved by the NIAUR. The codes cover a range of potential emergency scenarios, for example load shedding, whether by voltage reduction or disconnection, and Black Start, the procedure for re-energising the electricity network following a complete shutdown, specifying inter alia, technical details, notification protocols and implementation requirements.

### **[Statutory Licences](#)**

The following licences governing electricity transmission, distribution and market operation have been issued by NIAUR. All have conditions relevant to the prevention, preparation and management of electricity emergencies.

- SONI Transmission System Operator Licence (condition 14, 21)
- SONI Market Operator Licence (condition 12)
- NIE Distribution Licence (Condition 11, Annex 2 (para 14))
- NIE Transmission Licence

### ***Infrastructure Development***

SONI is responsible for the development of the transmission grid, in consultation with the NIAUR and relevant stakeholders. These requirements are set out in the NCER, the Grid Code and in the TSO licence<sup>10</sup>.

As TSO it has a responsibility for forecasting future demand over 10 year periods - [All island 10 year transmission forecast statement 2020](#) and the subsequent development of a 10 year programme of work known as the [Transmission Development Plan for Northern Ireland \(TDPNI\)](#). This considers those areas of the grid which need to be upgraded and provides recommended solutions, which may be adopted. This process is carried out across both jurisdictions, NI and ROI, to ensure that planning is undertaken from an all island perspective. The document is reviewed annually. SONI is also required<sup>11</sup> to contribute to a [European Ten-Year Network Development Plan \(TYNDP\)](#) every two years. The latest public report is available [here](#).

### ***Specific measures***

There are a number of specific measures that are relevant in preventing and preparing for electricity emergencies. These have been categorised according to the

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<sup>10</sup> Condition 18 – Transmission Interface Arrangements

Condition 20 – Operation of the Transmission System and the System Security and Planning Standards

Condition 40 – Transmission Development Plan NI (TDPNI)

<sup>11</sup> The Electricity Regulation Recast 714/2009, gives the requirement to ENTSO-E

electricity crises that they are most likely to help prevent or prepare for, however it is important to note that these measures can be used in a range of other scenarios.

## Malicious Attack

[The Centre for the Protection of National Infrastructure \(CPNI\)](#) works with industry and Government in NI to provide advice and assistance to those who have responsibility for protecting the electricity infrastructure. Responsibility for the protection of critical infrastructure, IT networks, data and systems from cyber-attack sits with the [National Cyber Security Centre \(NCSC\)](#). Both SONI and NIEN have been designated OES under the NIS Regulations and are subject to formal governance and reporting arrangements on cyber security controls for critical systems and processes.

Specific measures in place to prevent cyber and physical attack within the organisations include:

<b>SONI</b>	<b>NIEN</b>
cyber-security strategy	procedures to prevent and respond to a cyber-attack
dedicated IT security teams with experienced staff	cyber security policies are regularly reviewed and refreshed
internal cyber security forum with representation from across the SONI group	dedicated IT security teams with experienced staff
cyber security policies are regularly reviewed and refreshed	regular cyber security awareness training
membership of external networks including NIXIE and ENTSO-E Cyber Group	remote monitored CCTV on depots and a number of substations
regular cyber security awareness training	policies setting out security standards for the construction of T & D substations

control rooms with sophisticated access control systems	restricted access to operational critical areas of NIE Networks
physical building security and monitoring measures are used to ensure only legitimate entry is permitted	online reporting tool for public to report damage and vandalism
In the event that access is restricted to a Control Centre there are arrangements for the operation of an Emergency Control Centre.	community Information campaign on vandalism

## Extreme Weather

SONI and NIEN are in regular contact with the Meteorological Office and receive bespoke forecasts<sup>12</sup> on various types of weather event. There are a number of different plans and preparatory processes in place within both SONI and NIEN to monitor, prepare for and respond to extreme weather events such as storms, cold spells, heavy precipitation and winter incidents. These include:

***Winter Outlook Brochure*** - an annual summary, produced by SONI, providing information on expected electricity demand and capacity margin on an all-island basis over the winter months from November to February. It is normally published in the preceding months. This published outlook brochure informs stakeholders and the public of the available capacity margins during the winter months.

***Winter Readiness Report*** – an internal SONI document which captures the state of preparedness of the power system for the following winter. It is a more detailed analysis of the generation capability to withstand an emergency such as poor weather.

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<sup>12</sup> The Meteorological (Met) Office National Severe Weather Warning Service warns of the impacts caused by severe weather. Met Office weather warnings include a level of impact that the forecast weather is expected to bring and the likelihood of those impacts occurring.

It also considers the transmission system and any forced/planned outages which could impact the security of supply.

**TSO Severe Weather Plan** – an internal SONI plan which is triggered once the national forecaster establishes a risk of a storm. Within this plan a number of different elements of the power system are considered including, transmission, generation and scheduling, resourcing and communications. The communication flow is from the TSO to the DfE, the NIAUR as well as the Transmission Asset Owner and DNO. This plan allows the early intervention in the power system to ensure it is as secure as possible before the arrival of a storm.

**TSO Emergency Plan** – an internal plan which is triggered when a severe weather warning is received. It details procedures for mobilising staff and resources to the areas most likely to be affected by severe weather.

**DNO Emergency Plan and Storm Action Plan** – the plans are reviewed annually.

**DNO Duty Incident Teams (DIT)** - are stood up in response to severe weather or other incident response. These are managed by a Duty Incident Manager (**DIM**) and consist a team of six people plus additional support roles such as Stakeholder Engagement.

**DNO Local incident centres** – Northern Ireland is split into 12 areas or “districts” each with a Local Incident Centre (**LIC**) and a corresponding team of staff. All NIEN staff have a secondary “escalation role” and are allocated to a LIC. Each LIC has a core team based in the LIC office and their own allocation of local field staff -Engineers, Technicians, Lines staff and Tree Cutting staff, etc. During escalations the Dispatch function is delegated to each LIC which is responsible for implementing the **repair and restoration plan** - assigning resources to faults, updating progress and closing them down. Faults are addressed on the broad principle of restoring the most people within the shortest time. Typically large HV faults first, small and one-off LV faults last –but particular attention paid to medical customer care registered customers and Hazard and Extreme calls. Additional resources or cross-district moves are co-ordinated centrally by DIT.

### **Additional Resources**



NIEN has a number of agreements in place and contracts with third parties to ensure that additional resources are available in the event of a severe weather incident. These include:

- Contractor Lines staff and Tree Cutters
- Contract Diggers and Pole Erectors
- Access to 4x4 vehicles and helicopters from contract service providers
- NIEN -ESB Networks Emergency Assistance Agreement - which allows for mutual aid between DNOs in NI and ROI
- Northern Eastern Western & Southern Area Consortium Agreement (NEWSAC) - which allows for mutual aid between DNOs in GB, ROI and Isle of Man)
- Critical National Infrastructure Provider Protocol – which allows for mutual aid from NI utilities

**Training** - staff training programmes include regular workshops and severe weather simulations that are scenario based which are used for the certification of control room personnel.

**Flood risk assessments** - carried out by NIEN, for all large substations (transmission and primary distribution levels) if the substation is within a predicted flooding area<sup>13</sup>. This will determine the predicted flood depth and the subsequent flood defence/protection required.

**Geomagnetic Induced Currents** – NIEN undertake risk assessments for the NI distribution grid for susceptibility to GIC damage to key transformers and other assets.

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<sup>13</sup> [The second cycle draft Northern Ireland Flood Risk Management Plan \(2021-2027\)](#) identifies key electricity infrastructure such as power generation plants and electricity sub stations and categorises the risk of flooding events. The document details the protection measures to reduce flood risk to Kilroot Power Station, studies being undertaken at Coolkeeragh Power Station and feasibility work planned with regards to a flood alleviation scheme for Kilroot Power Station.

SONI has an internal policy document which details steps that the control centre must take to secure the transmission system.

**Technical Review** – NIEN review the technical standards for electrical plant and apparatus to ensure that it is able to operate in wider temperature ranges, with higher average summer temperatures<sup>14</sup>.

## Human Factors

Staff training and certification is undertaken in both SONI and NIEN which limits the likelihood of human error.

SONI control centre staff are re-certified every two years through a process which involves scenario training and a lessons learned approach. The training programme for certification for Control Centre Staff includes responding to complex and exceptional circumstances in system operation, including alert scenarios caused by large forecast errors. Shifts are regularly scheduled to take place in the Emergency Control Centre to ensure staff familiarity.

NIEN employs the following measures to avoid human error:

- Safety Rules training and authorisation processes
- Periodic refresher and re-authorisation processes
- Access approval system for operational critical applications
- Process for issue of Safety keys

Guidance on industrial action - The Trade Union and Labour Relations (NI) Order 1995 sets out requirements for industrial action. The Code of Practice on industrial ballots and notice to employers provides guidance on industrial action to trade unions and employers and promotes good practice in the conduct of industrial action ballots. SONI

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<sup>14</sup> In doing this, NIEN is working towards the 2080 climate change models that were developed by the Met Office in its UK Climate Projections (**UKCP 18**) and also the [Northern Ireland Climate Change Adaptation Programme 2019-2024](#)

has a Group Crisis Management Plan in place (updated Oct 2020) which will be invoked in the event of major incidents such as industrial disputes and strike.

## Fossil Fuel Shortages

[The NI Fuel Security Code \(FSC\)](#) aims to adequately protect the security of supply of electricity in NI and assist with the effective management of an event where primary fuel supplies for electricity generation are, or at risk of being, disrupted. The FSC describes arrangements for fuel stocking and auditing, arrangements for licence holders to coordinate contingency planning and the principles for financial settlement of generators in NI during an event.

**Secondary Fuel Stocks** - Certain generators are obliged to maintain and report secondary fuel stocks. The stocks are subject to physical inspections by SONI. The requirements vary depending on the type of generator.

- Higher Merit Generating Units - units that expect to operate more than 2,630 hours per year are required to hold stocks equivalent to five days continuous running based on the unit's rated capacity on its primary fuel.
- Lower Merit Generating Units - units that expect to operate less than 2,630 hours per year are required to hold stocks equivalent to three days continuous running based on the unit's rated capacity on its primary fuel.
- CHP units greater than 10MW are required to hold fuel stocks equivalent to one day continuous running based on the unit's rated capacity on its primary fuel.

**Secondary Fuel Testing** - SONI can instruct a generation unit to perform up to two successful secondary fuel tests per year. The arrangements for testing the capability of a generation unit to start up on secondary fuel or change-over from primary to secondary fuel and back to primary fuel are set out in an internal SONI document.

The generation unit must operate continuously while switching from its primary to its secondary fuel and it is required to switch from the primary to secondary fuel in five hours or less. These testing arrangements ensure the requirements of the FSC and Grid / Distribution<sup>15</sup> codes are met.

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<sup>15</sup> D-License Condition 11 and part of Condition 15 relate to the FSC.

**Gas Supply Emergency Training Exercise** - SONI along with other key stakeholders participate in an annual Gas Supply Emergency Training Exercise. The purpose of the exercise is to test the gas supply emergency arrangements. In the event of a gas supply emergency SONI may instruct generators to reduce gas consumption or switch to secondary fuels.

## System Failures

Localised technical failures on the network are common and can lead to short term, small scale disruption. Development and maintenance of the transmission and distribution system is key to ensuring that system failures, particularly more severe, large scale failures are avoided. Statutory and licence requirements ensure that SONI and NIEN operate a resilient network.

NIEN has in place a:

**Maintenance Policy** and **Strategic Spares Policy** - Maintenance work includes removing aged wooden poles, weaker overhead line conductors, etc. and where required, replaced with modern specification equipment capable of withstanding more severe weather.

**Vegetation Management Policy** - NIEN also operates a proactive policy in the vicinity of overhead power lines. This includes tree cutting, trimming and removal. Annually it maintains safety clearances to c. 10,000 km of overhead lines (and other equipment) across all voltage levels from nearby vegetation. The cutting cycle has been changed to help accommodate increased tree growth due to climate change and this is kept under constant review.

**Online reporting tool** - NIEN also operates an online reporting tool and call helpline to allow members of the public report damage to the network and hazardous situations.

## Pandemic

There is a protocol for regular meetings between the DfE, the NIAUR and the Energy Industry in order to ensure continuity of supply and to monitor the impacts of a pandemic on electricity supplies.

There are also established regular meetings with generators and network companies to assess service resilience and identify any emerging issues and risks.

The DfE collates statistics in relation to staff absences as a result of the COVID-19 pandemic. This exercise is carried out on a weekly basis and monitors the levels of staff absence amongst Tier 1 (critical), Tier 2 (essential) and Tier 3 (other workers). This information is shared with the NIAUR and senior DfE officials and monitored for security of supply purposes.

Both SONI and NIEN have internal measures in place to respond to the industry effects of a pandemic. This includes crisis management and emergency plans. Additionally the DNOs in NI, ROI and GB have specific COVID-19 protocols in place for resource sharing.

The response to the COVID-19 pandemic has provided valuable learning that will enable future action in the event of a pandemic or similar circumstance.

### 3.1(c) Market based measures to mitigate electricity crises, in particular demand-side and supply-side measures.

The Single Electricity Market (**SEM**) comprises various markets that operate independently and on different timelines with separate (although related) clearing and settlement mechanisms, covering both energy and non-energy services. The forward market, balancing market, balancing services and market pricing play an important

role in maintaining security of supply and preventing the occurrence and escalation of electricity emergencies



## Forward Market

The forward market helps to mitigate electricity crises as it ensures that there is sufficient reliable capacity and *long-term* security of supply. It is designed to encourage investment in existing and new capacity by providing payments to capacity providers through capacity auctions. In NI the NIAUR, supported by SONI, is responsible for determining the system-wide capacity required in each auction. Primary capacity auctions are run four years ahead (T-4) of each capacity year and (T-1) auctions are held just before the start of the capacity year. Additional auctions may be run if required—for example, if a new capacity project is cancelled. The requirement is set to maintain a system-wide 8-hour loss-of-load expectation (LOLE) per capacity year.

The following codes govern its operation:

- [Capacity Market Code](#)
- [Trading and Settlement Code](#)

## Balancing Market

The balancing market (**BM**) is where the TSO ensures supply matches demand and that the system constraints are respected. It is the primary market based mechanism that will be used to manage an electricity crisis. If the generators ability to supply its physical notifications (**PNs**)<sup>16</sup> does not balance against the forecast demand, the SEM Operator (**SEMO**) dispatches bids or offers to either increase or decrease generation or demand to restore the energy balance. If required, the TSO can also vary the interconnector flow by arranging a cross-border trade with the neighbouring TSO.

The operation of the BM is governed by the following codes and guidelines:

- [\*\*Trading and Settlement Code\*\*](#)
- [\*\*Balancing Market Principles Statement\*\*](#)
- [\*\*Electricity Balancing Guidelines \(EU 2017/2195\)\*\*](#)

SEMO continuously issues dispatch instructions both to maintain system security and to keep supply and demand in balance, choosing the least cost solution for the deviation. It has a licence obligation ([SEM Operator Licence](#) 22A) to establish and operate a merit order system for the BM.

## Energy Balancing Services

Balancing services are offered into the BM before real time in order to keep the transmission system balanced (i.e. energy supply = energy demand). The services are offered by generators (energy producers) and suppliers (energy consumers). For example, if demand is higher than expected, SONI might instruct a generator with available capacity to increase its output. Likewise it may instruct a user to reduce demand, known as a Demand Side Responder (**DSR**<sup>17</sup>). The participant is then paid

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<sup>16</sup> A market participant's best estimate of the expected output or demand for each of its units, excluding Accepted Offers and Accepted Bids, during each Imbalance Settlement Period

<sup>17</sup> Demand sites may be eligible to register as part of a DSU. A DSU must have a demand reduction capacity of at least 4MW. The maximum demand reduction capacity of an individual demand site in an aggregated DSU is 10MW. Demand sites with greater than 10MW demand reduction capacity may register as a stand-alone DSU.

through the BM for the energy action taken to balance the grid. SONI can also call on non-energy balancing services, such as voltage regulation or energy reserves.

## Market Pricing

Market pricing in the BM and the ID and IDM mitigate against the risk of an electricity crisis by providing incentives to MPs to provide balancing capacity and to ensure that the balancing capacity is available at the times that the TSO requires it.

***Imbalance Settlement Pricing*** - if capacity providers with awarded capacity do not deliver to the market at times of high energy prices, then they will not earn energy revenue but will be subject to difference charges at the Imbalance Price from the BM. This feature encourages awarded capacity to deliver at times of system scarcity.

***Administered and Reserve Scarcity Pricing (ASP)*** - ensures that the price reflects the cost and value of power in times of scarcity, in case the market prices and normal pricing process may not reflect this. This price sets the Price Floor at times of system stress (for example, reserve shortfall or load-shedding) to a much higher price than would normally be expected in the BM, but which should be reflective of the cost of scarcity in such times. As reserves fall below the standard requirements, the ASP rises.

## Non market based measures to mitigate electricity crises

The SEM is designed to be flexible and to take uncertainty in forecast demands, renewable generation and contingency events into account. The MO schedules reserves and formulates constraints to address these uncertainties and events as far as possible and build these into the operating schedules. Deviations from operating schedules, and their correction, are part of the normal and necessary real-time operation of a complex, dynamic power system. Exceptional events during an



electricity crisis may, however, cause the TSO to deviate from the normal operating processes and use the following non-market based responses<sup>18</sup>:

### ***Interconnector Emergency Assistance and Emergency Instruction procedures***

Emergency Assistance - EA is seen as an effective increase or decrease in active energy into the requesting TSO transmission system. It is required in extreme cases when one of the parties foresees a difficulty in meeting the expected demand on its system, or foresees a difficulty in maintaining security of its transmission system. The NI TSO can reduce the export to GB by up to 200MW for a maximum of two hours during a system alert. Firm prices are contained within the Balancing and Ancillary Services Agreement (**BASA**). An EA request from a TSO in NI, ROI or GB can be rejected by the other TSO. In other words, any EA request is subject to the other TSO agreeing to it.

Emergency Instruction – In the event that NI, ROI or GB experience a problem on the system that may have a safety or system security implication, including the risk of load shedding, it may be necessary to reduce the transfer on the interconnector. The transfer change will at most be to 0 MW (no change in transfer direction permitted). The relevant TSO covers the other for the costs of an EI. This would be discussed and agreed at an Interconnector Operating Protocol (**IOP**) Meeting.

The Business Process [Interconnector Emergency Actions](#) documents specific arrangements detailed for Emergency Assistance (**EA**) and Emergency Instruction (**EI**) in relation to the East West Interconnector (**EWIC**) and the Moyle Interconnector (**MI**).

### ***Declaration of a Fuel Security Event***

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<sup>18</sup> efforts would be taken to ensure compliance with the requirements laid down in Article 16 and compliance with regional and bilateral agreements.

In order to protect the supply of electricity in NI and assist with the effective management of an event where primary fuel supplies for electricity generation are, or are at risk of being disrupted DfE may declare a Fuel Security Event<sup>19</sup>. The TSO will instruct generators to switch to secondary fuels.

### 3.1(d) Framework for manual load shedding

Demand control may be triggered automatically following a significant system event or be planned by the TSO/ DSO in accordance with the relevant Grid Code in order to maintain system security. In a situation where demand control is necessary, demand disconnection/ load shedding will normally be the last option. It is utilised in circumstances when it is not possible to maintain a regulating margin between generation output and demand. These include insufficient generation, a sudden loss of generation (including interconnector transfers) and unacceptable voltage levels and thermal overloads.

The procedures relating to load shedding are subject to the rules set out in the [SONI Grid Code](#) (Operating Code 4), [the Distribution Code](#) (Operating Code 3), the Trading and Settlement Code and internal [TSO/ DNO](#) business processes.

**Planned Manual Load Shedding** is instructed by the TSO and facilitated by the DNO in accordance with the Grid / Distribution Code. It is carried out when there is reasonable notice period (>1 minute) to instruct the DNO (see process steps below). If load shedding is required for a protracted period rota load shedding will be implemented. Planned manual load shedding is the preferred mode of operation as load can be shed in smaller amounts allowing for finer control.

**Rota Load Shedding** is instructed by the TSO and implemented through the DNO Control Centre. The instruction will include a percentage of the system demand to be disconnected initially and then additional Mega Watts as required. Where prolonged disconnection is envisaged the DNO will, where possible, utilise disconnection rotas

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<sup>19</sup> [In accordance with the Fuel Security Code \(NI\)](#)

and sequencing of load blocks. The NI system is arranged into 18 load blocks “A” to “U” each block containing ~ 5% of system load. Blocks can be shed via SCADA at a rate of 1 block per c. 50 seconds. After use the block or blocks would drop to the bottom of the list and so the blocks are rotated. This ensures equitable treatment amongst all non-protected customers. The DNO manages the customer communications on a block-by-block basis.

**Emergency Manual Disconnection Procedure** is initiated by the TSO for load shedding at Bulk Supply Points. It is a crude means of control causing high load disconnections. The procedure is utilised in circumstances where there is insufficient time to instruct the DNO (<1 minute) to use planned load shedding or when there are communication problems between TSO and DNO.

**TSO Process steps Planned and /or Emergency manual Disconnection**

#	Step	Step Description	Responsible Role	Outputs	Indicative Timing/ Frequency	System
1	Demand control required	The need for demand control is the trigger of this process.	Real Time	N/A	As required	N/A
2	Demand control required in NI or ROI?	Demand control should be implemented by the relevant control centre in that jurisdiction. Is load shedding required in Northern Ireland or Ireland? If Northern Ireland, go to step 3 If Ireland, go to step 7. This acts as a trigger for the Declaration of Red Alert process and ENTSOe Awareness System (EAS) if time permits and if practical	Real Time	Decision	As required	N/A
3	Required in < 1 min?	If the load shedding in Northern Ireland is required in less than one minute, then go to Step 4, else Step 5	Real Time CHCC	Decision	As required	N/A
4	Initiate manual load shedding via EMS	CHCC implements a manual Load Shed via EMS	Real Time CHCC	Demand Reduction	As required	EMS
5	Contact NIE Networks DCC and instruct Load Shedding	Contact NIE Networks DCC and instruct manual load shedding including % of system demand initially and then MWs (as per agreed process).	Real Time CHCC	N/A	As required	Phone / MMS

6	Shed required load	NIE Networks shed the required load as instructed by Real Time CHCC.	NIE Networks	Demand Reduction	As required	N/A
Steps 7-10 relate to TSO in IE						
11	Due to generation scarcity?	Was the demand control event instructed due to a generation scarcity and not a local fault or transmission reason? If yes, go to Step 12 If no, then no further action is required by the TSO.	Real Time	Decision	As Required	N/A
12	Enter predicted load shedding in MMS	Real Time user must enter predicted load shedding (any non-zero value will do if unknown) in the Demand Control Volume field on the Market Applications -> RT Imbalance Pricing -> PIMBCALCULATOR -> RTPIMB Input -> RTPIMB – Execution Control Parameters screen of the MMS. This ensures that the Administered Scarcity Price is automatically triggered within the MMS.	Real Time	N/A	As Required	MMS
13	Begins Administered Scarcity Pricing	Administered Scarcity Pricing is automatically triggered within the MMS.	System step	N/A	As Required	MMS
14	Perform Short-Term Scheduling	If time permits, short-term scheduling should be performed	Real Time	N/A	As Required	MMS
15	Clear predicted load shedding in MMS once all load is restored	Once all load has been restored the Real Time user must clear the predicted load shedding by setting the Demand Control Volume field to zero on the Market Applications -> RT Imbalance Pricing -> PIMBCALCULATOR -> RTPIMB Input -> RTPIMB – Execution Control Parameters screen of the MMS. This ensures that the Administered Scarcity Price automatically ends within the MMS.	Real Time	N/A	As Required	MMS
16	Ends Administered Scarcity Pricing	Administered Scarcity Pricing automatically ends within the MMS.	System step	N/A	As Required	MMS

***Automatic Load Shedding / Low Frequency Demand Disconnection*** is initiated automatically following an unexpected and significant event resulting in a low frequency. It is utilised in order to prevent system collapse and to restore the balance between generation output and demand. Automatic low frequency relays at transmission substations exist to cover 80% of the NI load starting at 48.85 Hz and provide separation of the distribution networks in NI and ROI at 48.2 Hz. Low frequency relays are (normally) located at Bulk Supply Points (110/33kV substations). Once operated, these relays turn off large blocks of load, to ensure that the falling frequency is arrested and a blackout avoided. The lower the frequency the greater the number of relays that operate.

A Low Frequency Load Shedding schedule gives the load block and the location of the relay, and the predefined frequencies at which the relays trip. The TSO is responsible for the review and publication of the Low Frequency Load Shedding schedule. Changes to the schedule are published normally as a result of an event. These settings are then reviewed to maintain equitable customer exposure to low frequency events.

### ***Special protection against disconnection***

'Protected Customers' is a defined term which refers to customers that are excluded from Demand Control process. The following industry codes place requirements on the TSO and DNO to implement protection measures to qualifying electricity customers in order to safeguard electricity supplies:

- Distribution Code OC3 (1.7) - requires a Protected Sites List (**PSL**) to be held and maintained by the DNO. PSL sites may be designated if they need to have their electricity supply maintained because of a national or regional critical need, public health and safety issues or the potential for catastrophic damage to high value plant.

- ESEC (NI)<sup>20</sup> – ensures an equal distribution of supply to customers in an emergency situation as far as it is technically possible. It also ensures that local pre-designated protected sites maintain supplies for as long as possible. Sites may be designated as ‘protected sites’ if they need to have their electricity supply maintained because of a national or regional critical need, public health and safety issues or the potential for catastrophic damage to high value plant . The ESEC(NI) sets out the criteria and registration process for ‘protected site’ status. Designated services include:
  - licenced electricity generators and licenced network operators
  - vital oil pumping stations
  - sites with continuous manufacturing processes
  - essential water and sewerage installations
  - digital and telecommunication services where there is a national need for continued operation
  - financial services where there is a national need for continued operation
  - significant transport operations and infrastructure
  - hospitals
  - essential food manufacturing, processing and storage sites

An additional layer of protection is provided to vulnerable domestic electricity customers who are dependent on life supporting electrical equipment. The DNO operates a [Medical Customer Care Register](#) which provides extra support for customers with healthcare needs. Some customers have medical equipment in their homes, such as specialised mattresses, feeding systems or lifting equipment. These types of equipment need electricity.

### 3.1(e) Mechanisms for informing the public

#### ***Communications strategy***

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<sup>20</sup> ESEC(NI) is currently being developed, based on the existing UK [Emergency Supply Network Code](#).

Success in managing an electricity incident depends on timely contact with the public and a coordinated communication campaign. This is managed by the NI Executive<sup>21</sup> and Industry and involves interaction with the media, emergency services, Councils and other stakeholders.

A coordinated Communications Strategy is in place to inform the public of an electricity crisis. The strategy identifies the relevant actors and the type of messages that are delivered. Depending on the severity of the crisis, messages come from various sources, however, the strategy ensures that messages from the NI Executive, the Emergency Services, Industry, the media and local responders are *consistent*.

Statements about the crisis are agreed and communicated through a number of channels including the NI Executive's Energy Press Office and Public Relations representatives.

Information is uploaded on relevant websites – DNO, electricity suppliers, local councils and support agencies and also the NI Government website NI Direct (with a link from DfE). These webpages provide links to additional help and support services.

Call handling facilities are put in place at various levels depending on requirement.

There are clear procedures for informing the public about an electricity crisis. These are documented in the NI Response Strategy to Gas and Electricity Supply Emergencies, the Grid Code, the Distribution Code and through various licence conditions. The level of procedure employed is dependent on the scale and severity of the crisis and the anticipated impacts.

### ***Communication Channels***

A Public Enquiry Line Protocol is detailed as part of the Communications Strategy. The initial responsibility for leading a communication response sits with the DNO and electricity supply companies affected by the disruption. Where an incident escalates to wider or prolonged disruption then the TSO, in conjunction with the DNO, will

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<sup>21</sup> In the event of a UK wide emergency. The UK Government will become LGD and will manage a UK communication campaign in coordination with industry.

coordinate a wider industry response and the DfE will lead in an associated wider NI Executive response. Only if the effect has the potential to significantly impact on other Departments' areas of interest or the wider community will NI Government activate central response mechanisms coordinated by Civil Contingencies Framework.

The DNO has a sophisticated communications systems to keep customers informed when they are without electricity. Members of the public can phone directly or seek relevant information online, through the website – [www.nienetworks.co.uk/power-cuts](http://www.nienetworks.co.uk/power-cuts)

During an electricity crisis, particularly in the early stages, it is envisaged that thousands of customers will contact the DNO directly. As it is not possible for call handlers to speak to every customer personally, a High Volume Call Answering system uses telephone number and voice recognition technology to identify properties without electricity supplies and provide the most up to date information for the area.

Call handling services will also be employed by the NI Government through [NI Direct](#) in the event of a severe disruption when call volumes with suppliers and the DNO are high. The call handlers will work to an agreed script and callers will be directed to relevant responder organisations that can assist.

## 3.2 Regional Cooperation Mechanisms

### 3.2(a) Mechanisms for cooperation within the region

There are a number of agreed mechanisms between NI, ROI and GB that allow for cooperation before and during an electricity crisis. These mechanisms are contained within various agreements, operating protocols and licences and business processes which are underpinned by legislation<sup>22</sup>.

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- <sup>22</sup>This includes: Regulation (EU) 2017/2196 Network Code on Electricity Emergency and Restoration (NCER)
  - Regulation (EU) 2016/1447 Network Code on High Voltage Current Connections (HVCC)
  - Regulation (EU) 2016/1388 Network Code on Demand Connection (DDC)
  - Regulation (EU) 2017/1485 Network Code on electricity transmission system operation (SOGL)
  - Regulation (EU) 2015/1222 network Code on Capacity Allocation and Congestion Management (CACM)
  - Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity



### ***Governmental Cooperation***

There are agreed Governmental communication and reporting procedures in place between NI, ROI and GB (outlined in NI Response Strategy for Gas and Electricity Supply Emergencies and the Civil Contingency Framework and CCGNI). These come into play when there is a potential or actual electricity crisis.

### ***System Operator Agreement (SOA)***

The [SOA](#) is a requirement of the SONI TSO licence and EirGrid TSO licence. This agreement sets out conditions that ensure that the operations of one TSO do not adversely affect the operations of the other TSO.

### ***Synchronous Area Operating Agreement (SAOA)***

The [SAOA](#) recognises that the transmission systems of NI and ROI are electrically connected and synchronised. The document sets out the agreement and working arrangements required by the respective TSO licences to ensure that security standards are maintained in the synchronous area and to facilitate greater cross-border cooperation.

### ***Interconnector Operating Protocols (IOPs)***

The IOPs outline a number of agreed mechanisms between the TSOs in NI, ROI and GB. Those relevant in an emergency situation include:

- Emergency Assistance (**EA**) - a service both to and from the neighbouring system (Eirgrid or NGET) which is an effective increase or decrease in active energy into the requesting TSO transmission system. It is envisaged that EA will be required in extreme cases when one of the parties foresees a difficulty in meeting the expected demand on its system, or foresees a difficulty in maintaining security on its transmission system. EA will be assumed available for each TSO to instruct unless specifically withdrawn or an EAS level other than Normal or Alert state is active.

- Emergency Instruction (**EI**) - one of the emergency services in place between SONI, Eirgrid and NGET to manage cross-zonal interconnector schedules. There is an Emergency Instruction arrangement in place with the GB TSO. This service is an emergency service that allows either party to instruct a reduction in interconnector flow towards zero. The service would be utilised during an operational security event such as a circuit overloading and results in the application of a reduced Net Transfer Capacity (NTC) on the interconnector.
- Reserve services - which enable TSOs to share reserves across HVDC interconnectors.

### ***SONI TSO Licence***

The [SONI Licence](#) sets out requirements for cooperation by SONI with the Eirgrid and the NI transmission owner, specifically;

- Condition 18 – Transmission Interface agreements
- Condition 11- Restriction on Use of Certain Information
- Condition 24 – System Operator Agreement
- Condition 33- Transmission System Capacity Statement
- Condition 36- Provision of Information to Other System Operators

Both the Eirgrid TSO licence and the NIEN Transmission System Owner licence contain reciprocal requirements.

### ***Alert Systems Procedure***

The System Alerts Procedure Ireland and Northern Ireland is used by the control centres in both NI and ROI in the event of a change in system state. This procedure ensures that both SONI and Eirgrid communicate a change of state at the earliest opportunity. The respective TSO will also update the EAS, which notifies other European TSOs that the SEM network is in Emergency state.

### ***System Defence Plan***

The SDP details inter-TSO assistance and coordination procedures before and during an emergency state. It also ensures any defence measures will not lead interconnected transmission systems into an Emergency state or Blackout state.

### ***System Restoration Plan***

The PRSP details the agreed measures that allow for a top-down restoration (energisation from other TSOs) in the event of an electricity emergency.

### ***Single Electricity Market Operator (SEMO) arrangements***

The SEMO arrangements include business processes specifically relating to cross border trading.

[BP SO 11.2 CBB Trading between EirGrid SONI and NGET.pdf \(sem-o.com\)](#)

[BP SO 11.3 Interconnector Emergency Actions.pdf \(sem-o.com\)](#)

[BP SO 11.4 Coordinated Third-Party Trading.pdf \(sem-o.com\)](#)

### ***Demand Control Process***

The [Demand Control Process](#) applies where there is insufficient generation or transfers to meet demand in all or any part of another TSO's system where the TSO is able to assist the other TSOs.

## 3.2(b) Technical, legal and financial arrangements for the implementation of cooperation measures

The System Operator Agreement (**SOA**) highlights the technical, legal, financial and governance arrangements that are in place between the TSOs in NI and ROI. Arrangements with NI/ROI and GB are also included as part of the IOPs and at regular IOP meetings.

Under Emergency Assistance (**EA**) the maximum available volume is 180MW and is capped by the Net Transfer Capacity declared at the time of the request, however, the

request for EA must be met by the other party provided that the party providing the EA does not foresee, in meeting such a request, a difficulty in meeting the expected demand /in maintaining security on its own transmission system.

There are firm prices agreed for EA within the Balancing and Ancillary Services Agreement (**BASA**), which forms the binding agreement between the TSOs for financial reconciliation for energy differences from planned operation. Provision of EA is for a maximum of 2 hours unless otherwise agreed by both parties.

(c) Mechanisms for cooperation with other Member States outside of the region as well as with third countries within the relevant synchronous area.

A synchronous system and Single Electricity Market (**SEM**) is in operation across the two jurisdictions on the island of Ireland. The system is interconnected with GB only. This will change when interconnection with France is implemented via the Celtic Interconnector (dated 2026). There are no other Member States or third countries within the synchronous area.

## 4. National Crisis Coordinator

Pursuant to article 11 of the Risk Preparedness Regulation, the role of Crisis Coordinator has been assigned to SONI, the System Operator for Northern Ireland.

### **Contact details:**

SONI Ltd.

12 Manse Road

Belfast

County Antrim

BT6 9RT

Telephone: +44 (0)28 90794336

Email: [info@soni.ltd.uk](mailto:info@soni.ltd.uk)

The crisis coordinator will work to agreed processes as set out in NI Response Strategy to Gas and Electricity Supply Emergencies to ensure an appropriate and timely response to a potential or actual electricity crisis in Northern Ireland. SONI will work jointly with industry and NI Government through NIJRT to ensure that the response is coordinated and implemented effectively.

## 5. Stakeholder Consultation

This Risk Preparedness Plan has been produced in consultation with SONI, NIEN and the NIAUR and shared with Mutual Energy Ltd. Kilroot, Coolkeeragh and Ballylumford power stations for review and comment. It has been forwarded to the Electricity Coordination Group (**ECG**) for further consultation.

## 6. Emergency Tests

As part of the risk preparedness process it is essential that there is a framework for monitoring and assurance. Regular review and testing of the risk preparedness plan will take place at various levels including energy industry, national and regional levels.

### 6.1 RPP Review

The crisis scenarios and risk assessment will be updated every 4 years, or more frequently if necessary and a new crisis comes to light. In line with this, the RPP will also be regularly reviewed and any updates in terms of procedures and measures will be added to the plan accordingly. This review will be undertaken by BEIS with operational input from DfE and with contribution of all the key stakeholders including the TSO, DNO and the NIAUR.

### 6.2 Energy Industry Testing

**Regular testing**, facilitated by the TSO, is already carried out as part of its licence requirements and the requirements within the NCER. These tests involve testing the measures within the SDP and the PSRP as detailed in the [Test Plan for Northern Ireland](#). Such tests include regular capability testing to ensure the proper functioning of the service providers' equipment and capabilities and ensure as far practicable that the service will operate correctly and within the defined time-frame when called upon.

In order to test internal procedures and train personnel both the TSO and DNO have training programmes which include **regular workshops** and **simulations** that are scenario based. These include storm simulations and load shedding simulations.

Black Start tests are carried out **annually**. These are live exercises designed to simulate real time response of electricity crises in order to inform Emergency Planning. They are led by SONI and include other relevant actors including:

- Kilroot, Coolkeeragh and Ballylumford power stations with Black Start capability
- NIEN
- SGUs
- Relevant NI Government Departments including DfE
- NIAUR
- Relevant Public Relations/ media departments/ organisations

Communication protocols are tested through the Power System Emergency Communications Plan (**PSECP**). This forms part of the live exercise carried out on an annual basis. It is the intention to test varying RPR crisis scenarios during the above annual Black Start and PSECP tests.

### 6.3 Regional Testing

There is an intention to undertake regional testing of the RPP every 2 years. This test will involve the simulation of differing crisis scenarios that may have an all island/ regional impact. The test will ensure that existing regional/ bilateral measures and agreed co-operation and assistance mechanisms are robust. It will be carried out as a table top exercise with the aim of testing all island Government to Government protocols. The test will involve the following stakeholders (subject to agreement):

- Transmission system operators for NI (SONI) and ROI (Eirgrid)
- Relevant Government departments in NI (DfE) and in ROI (DECC)
- Competent Authorities for the UK (BEIS) and ROI (CRU)



# Appendix 1

The risk assessment follows the methodology developed by ENTSO-E, pursuant to Article 6(1) of the RPR. Each crisis scenario has been rated according to the likelihood (Table 1) and operational impact expressed in terms of EENS% and LOLE hours<sup>23</sup> (Table 2).

**Table 1. Crisis Likelihood Scale**

Classification	Events per year	1x.....year	Description/ example of initiating event
Very likely	≥ 0.5	2 or less	event expected practically every year, e.g. extreme winds/storms causing multiple failures of overhead lines may be expected nearly every year in some areas
Likely	0.2-0.5	2-5	event expected once in a couple of years, e.g. extreme heat wave causing limits on output of open-loop water-cooled power plants, low water levels at hydro plants, higher load, etc.
Possible	0.1-0.2	5-10	event expected or taken into consideration as a potential threat, e.g. cyber or malicious attack
Unlikely	0.01-0.1	10-100	very rare event with potentially huge impact, e.g. simultaneous floods causing unavailability of generation, distribution and transmission infrastructure
Very unlikely	≤ 0.01	100 or more	event not observed but potentially disastrous, e.g. earthquake causing a huge destruction of transmission, distribution and generation infrastructure

<sup>23</sup> EENS% - Expected Energy Not Served due to insufficient resources to meet demand - expressed as a % of total MW  
 LOLE – Loss of Load expectation expressed in hours

**Table 2- Crisis Impact Scale**

Classification	EENS % (of annual demand)	LOLE [hours]*
Disastrous	≥0,25%	≥168
Critical	≥0,05% and <0,025%	≥48 and <168
Major	≥0,01% and <0,05%	≥12 and <48
Minor	≥0,002% and <0,01%	≥3 and <12
Insignificant	<0,002%	<3

A crisis scenario rating is calculated using the Likelihood / Impact matrix (Table 3) using data obtained from the process highlighted above. A value is then applied to this rating (Table 4).

**Table 3- Likelihood/ Impact matrix**

Impact		Likelihood				
EENS%	LOLE	Very Likely	Likely	Possible	Unlikely	Very Unlikely
Disastrous	Disastrous	Disastrous	Disastrous	Critical	Major	Minor
Disastrous	Critical	Disastrous	Critical	Critical	Major	Minor
Critical	Disastrous	Disastrous	Critical	Critical	Major	Minor
Disastrous	Major	Disastrous	Critical	Major	Major	Minor
Major	Disastrous	Disastrous	Critical	Major	Major	Minor
Disastrous	Minor	Disastrous	Critical	Major	Major	Minor
Minor	Disastrous	Disastrous	Critical	Major	Major	Minor
Disastrous	Insignificant	Disastrous	Critical	Major	Major	Minor
Insignificant	Disastrous	Disastrous	Critical	Major	Major	Minor
Critical	Critical	Disastrous	Critical	Major	Minor	Minor
Critical	Major	Critical	Critical	Major	Minor	Minor
Major	Critical	Critical	Critical	Major	Minor	Minor
Critical	Minor	Critical	Major	Major	Minor	Minor
Minor	Critical	Critical	Major	Major	Minor	Minor
Critical	Insignificant	Critical	Major	Major	Minor	Minor
Insignificant	Critical	Critical	Major	Major	Minor	Minor
Major	Major	Critical	Major	Major	Minor	Insignificant
Major	Minor	Major	Major	Minor	Minor	Insignificant
Minor	Major	Major	Major	Minor	Minor	Insignificant
Major	Insignificant	Major	Major	Minor	Minor	Insignificant
Insignificant	Major	Major	Major	Minor	Minor	Insignificant
Minor	Minor	Major	Minor	Minor	Insignificant	Insignificant
Minor	Insignificant	Major	Minor	Minor	Insignificant	Insignificant
Insignificant	Minor	Major	Minor	Minor	Insignificant	Insignificant
Insignificant	Insignificant	Minor	Minor	Insignificant	Insignificant	Insignificant

A value is then applied to the crisis scenario rating.

**Table 4. Crisis scenario rating**

Crisis scenario rating	Value
Disastrous	10
Critical	5
Major	2
Minor	1
Insignificant	0

Cross border dependency rating is calculated as per the table below.

**Table 5. Cross border dependency rating**

Cross border dependency rating	Value	Description
None	1	The crisis has no impact on other countries, even if they are facing simultaneous crisis.
Minor	1.2	The crisis is susceptible to aggravate a simultaneous crisis in at least one other country, either through direct or indirect causes (cf. Article 3).
Major	2	The crisis is susceptible to generate a cross-border crisis in at least one other country, either through direct or indirect causes (cf. Article 3).

The values of crisis scenario ratings and cross-border dependency ratings are used to compute a national rating for the scenario using the following equation:

$$\text{National Rating} = \text{Crisis Scenario Rating} \times \text{Cross Border Dependency Rating}$$