# EXPLANATORY NOTE RELATED TO THE TEST PLAN

14/10/2019

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# 1. Practical information

This note aims to contextualize the Test Plan to be submitted by ELIA as required by Regulation EU 2017/2196 establishing a network code on electricity emergency and restoration (NC ER).

At the end of the public consultation, all comments will be made public on Elia's website, with an explanation of how Elia responded to these remarks or the reasons why they were not considered. Elia will respect the potential request for confidentiality and/or anonymity of respondents.

Comments concerning items outside the scope of the documents will not be considered by Elia.

The Test Plan submitted for consultation can be consulted on the Elia website.

Stakeholders have one month to comment. Reactions must be sent no later than Thursday 14/11/2019 using the online form available on the Elia website.

Questions and / or other remarks concerning the documents concerned can be sent to the following email address: consultations@elia.be.

# 2. Introduction

Regulation (EU) 2017/2196 establishes requirements for the management, coordination and operation of the network in the European Union in a state of emergency, blackout or restoration. These requirements are intended to maintain operational safety and prevent the spread of an incident on the power grid that could result in a widespread failure.

In accordance with this regulation, Elia makes the Test Plan available.

This explanatory note gives a brief description of the main principles of Test Plan and justifies the way these principles have been developed.

In accordance with article 259 of the Federal Grid Code, ELIA will submit the Test Plan (in Dutch and French) for approval to the minister of Energy, by December 18th 2019.

In case the System Defence Plan or the Restoration Plan are updated and rely on new services, a new version of the Test Plan will be submitted for approval.

# 3. Legal framework

The Test Plan is elaborated by ELIA, taking into account the prescriptions of Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration (NC ER) and taking into account relevant legislation (national federal grid code) as well as possible local specificities and other Network Codes (NC)

- Regulation (EU) 2016/631 establishing a network code on requirements for grid connection of generators (NC RFG)
- Regulation (EU) 2016/1388 establishing a Network Code on Demand Connection (NC DCC)
- Regulation (EU) 2016/1447 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules (NC HVDC)

The test plan shall follow the methodology laid down in the NC RfG, in the NC HVDC and in the NC DCC for the corresponding tested capability. However, for SGUs existing before the entry into force of these codes, the NC ER foresees that the test plan shall follow the provisions of national law. Regarding that Belgian law does not foresee any methodology, ELIA follows the methodology laid down in the three sub-mentioned NCs for both existing and new installations.

It is nevertheless important to mention that Article 263 of the Federal Grid Code authorizes Elia to organize tests in order to assess the performances of the measures identified in the System Defence Plan and in the Restoration Plan. This provision also stipulates that the tests have to be organized in concertation with the stakeholders and at Elia's costs.

The Test Plan of ELIA identifies equipment and capabilities relevant for the System Defence Plan and the Restoration Plan that have to be tested. The Test Plan also describes the tests that should be executed for the relevant equipment.

# 4. Test plan explanation

## 4.1. Introduction

The Test Plan aims to identify equipment and capabilities relevant for the System Defence Plan and Restoration Plan that have to be tested. Article 43(3) of NC ER gives more details on the Test Plan's content and stipulates that the Test Plan shall include the periodicity and conditions for the test outlined in Article 44 to 47 of NC ER. These articles relates to:

- Power Generating modules delivering black start and/or quick resynchronisation services (Article 44)
- Demand facilities providing demand side response (Article 45)
- HVDC system delivering a black start service (Article 46)
- Low frequency demand disconnection relays (Article 47)

## 4.2. Compliance testing of Power Generating Modules capabilities

According to Article 44 of NC ER a test should be described in the Test Plan for the following services provided by PGMs which are RSPs:

- Black start service
- Quick resynchronisation service.

### 4.2.1. Black Start services

The section of the Test Plan related to the test to be executed by Restoration Service Providers (RSPs) providing Black Start services are based on the first version of the Terms and conditions to act as a Restoration Service Provider submitted to the CREG for approval on December 18th, 2018. CREG has commented the terms and conditions and a new version is also submitted in the context of this public consultation. The Test Plan and the new version of the Terms and Conditions to act as a Restoration Service Providers are aligned and take the comments made by CREG into account.

The Test Plan also proposes the following changes compared to the tests to be executed in the first version of the T&C RSP:

- **Test 4 as standard Black Start compliance test:** The previous version of the tests included 5 types of test that could be asked by Elia to verify compliance. These tests can go from a simple verification (Test 0) to a complete start-up, connection and re-energization of a dead busbar (Test 4). To avoid confusion and discrimination between Restoration Service Providers, Elia proposes to define Test 4 as the standard test to verify black start compliance. If, due to particular circumstances, Test 4 cannot be executed, another test will be realized. The choice of the test will be made in concertation with the RSP.
- **Clarification of the test periodicity to at least 3 year:** Article 44(1) of NC ER requires that a black start capability test occurs at least every 3 years. This periodicity has been specified in the Test Plan. Apart from the periodic test every three years, ELIA preserves the right to request the RSP to perform intermediate tests among those described above, if deemed necessary by ELIA.

- **Introduction of a Reference Date:** The concept of a Reference Date has been introduced to clarify the test date. The Reference Date is defined as the furthest date forward between:
    - The date of entry into force of the RSP Contract plus six months
    - The date of the previous Black Start capability tests on the same Restoration Facility plus three years.

  The test can occur up to 3 months before and up to 3 months after the Reference Date.
- **Clarification of the tests' descriptions:** The wording of the test description has been improved to avoid ambiguities. However, no requirements have been added and/or deleted.

The Test Plan only gives a description of the tests. The consequences of a failed test are contractual matters and therefore included in the Terms and Conditions to act as a Restoration Service Provider only.

### 4.2.2. Quick resynchronisation services

In the current version of the Restoration Plan, ELIA does not contract quick resynchronisation services. Hence, no test is described for such services in this version of the Test Plan. However, according to Article 15(5)(c) of NC RfG, PGM of type C & D shall be capable of quick resynchronisation in line with the protection strategy agreed between the relevant system operator, ELIA and the power generating facility.

If, in the future, ELIA contracts RSP which are PGM providing a quick resynchronization service, a test procedure will be developed considering the minimal requirements laid down in Article 44(2) of the NC ER, Article 45(6) and Article 15(5)(c) of the NC RfG. In that case, a new version of the Test Plan will be submitted for approval.

## 4.3. Compliance testing of demand facilities providing demand side response

According to Article 45(1) and Article 45(2) of NC ER, Defence Service Provider (DSP) delivering demand response or LFDD shall execute a demand modification test or LFDD test. However, the current version of the System Defence Plan, does not include measures to be executed by DSPs delivering demand response or LFDD. Hence, no test is described for such services in this version of the Test Plan.

If in the future, actions of the System Defence Plan should rely on actions from DSPs delivering demand side response, a dedicated test will be developed in concertation with the stakeholders and taking into account the minimum requirements laid down in Article 45(1) of the NC ER and Article 41(1) of the NC DCC. In that case, a new version of the Test Plan will be submitted for approval.

If in the future, actions of the System Defence Plan should rely on actions from DSPs applying LFDD, a dedicated test will be developed in concertation with the stakeholders and taking into account the minimum requirements laid down in Article 45(2) of the NC ER and Article 37(4) of the NC DCC. In that case, a new version of the Test Plan will be submitted for approval.

## 4.4. Compliance testing of HVDC capabilities

According to Article 46 of NC ER, each RSP which is an HVDC system delivering a black start service shall execute a black start capability test. However, in the current version of the

Restoration Plan, ELIA does not rely on HVDC systems delivering black start capabilities. Hence, no test is described for such services in this version of the Test Plan.

If, in the future, ELIA contracts RSPs which are HVDC systems providing black start capabilities, a test procedure will be developed on a case by case basis, based on the RSP capabilities and considering the minimal requirements laid down in Article 46 of the NC ER, Article 71(11), Article 37(2) and Article 37(3) of the NC HVDC. In that case, a new version of the Test Plan will be submitted for approval.

## 4.5. Compliance testing of low frequency demand disconnection (LFDD) relays

According to Article 47 of NC ER, each DSO & TSO shall execute testing on LFDD relays implemented on its installation in order to demonstrate the technical capability of the transmission-connected distribution facilities/demand facilities to operate from a nominal AC supply specified by ELIA.

Due to the criticality of such equipment, Elia tests the equipment at three different moments even if this is not explicitly required in the NC ER:

- Execution of a **qualification test** taking place before the installation of the LFDD relay
- Execution of a **commissioning test** taking place at least when a new LFDD relay is installed
- Execution of a **periodical test** taking place at least every 10 years if the relay has not been tested during this period.

As the NC ER only specifies requirements for a periodical test, the qualification and commissioning tests are not described extensively in this Test Plan.

Two values are specified for the test:

- A **maximum operating time of 150 ms** as specified in Article 19(1)(c)(ii) of NC DCC
- A **test periodicity of 10 years** based on the qualified lifetime of the relays of 20 years.