
Real time data and communication

ENTSO-E guidance document for national
implementation for network codes on grid connection

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DESCRIPTION

Code(s) and Article(s)

NC RfG : Article 14.5 (d) – EU Regulations 2016/631

NC DCC : Article 18 – EU Regulations 2016/1388

NC HVDC : Articles 31 and 51 – EU Regulations 2016/1447

Introduction

The three Connection Network Codes establish different requirements to the Grid Users in terms of information to be exchanged with the relevant TSO and/or to the relevant system operator of the facilities connected to the network.

The relevant TSO and/or relevant system operator shall receive real time data in order to be aware of the network status at any moment.

Adequate information shall be exchange between system operators, either TSOs, DSOs, and Grid Users (understood here as all equipment subject to applicability of the stated requirements, i.e. generator and demand facilities). The required information is a fundamental prerequisite for system operators in order to maintain system stability and security of supply.

System operators need to have a continued overview over the states of their system, which includes information on the condition and actual state as well as the actual availability of the Grid Users.

Another fundamental aspect of the information exchange process is the capability to communicate between the parties involved in a secure manner.

Taking the latter into account, the mere capability to exchange information is required for all SGU's, except Type A generators and demand facilities. It's recommended to require the communication capability in a non-exhaustive manner, because the detail on the information to be exchanged depends on the operational strategies specified by the relevant system operator and the Relevant TSO.

Through the implementation of the Guideline on transmission system operation (SO GL) a methodology will be created where the generic rules will be specified to the required details.

Concerning the implementation of the various network codes and guidelines involved (NC RfG, NC DCC, NC HVDC, SO GL and NC ER) the following principles, is recommended to be taken into consideration by the relevant system operator:

Allow for third parties to fulfill the requirements on behalf of the end-

	<p>user (aggregators) Authorizing sharing of the information or part of the information between the parties involved to the outmost extend where possible Securing discretion according to the agreed confidentiality level by all parties involved. All technical aspects of the applied protocol and security measures to follow the recommendations published by ENTSO-E.</p>
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NC Frame **NC RfG Article 14.5 (d)**- Requirements for Type B, Type C and Type D power generating modules:

- (a) *with regard to information exchange:*
- (i) *power generating facilities shall be capable of exchanging information with the relevant system operator or the relevant TSO in real time or periodically with time stamping, as specified by the relevant system operator or the relevant TSO;*
 - (ii) *the relevant system operator, in coordination with the relevant TSO, shall specify the content of information exchanges including a precise list of data to be provided by the power generating facility.*

NC DCC. Article 18- Information exchange:

1. *Transmission-connected demand facilities shall be equipped according to the standards specified by the relevant TSO in order to exchange information between the relevant TSO and the transmission-connected demand facility with the specified time stamping. The relevant TSO shall make the specified standards publicly available.*
2. *Transmission-connected distribution system shall be equipped according to the standards specified by the relevant TSO in order to exchange information between the relevant TSO and the transmission-connected distribution system with the specified time stamping. The relevant TSO shall make the specified standards publicly available.*
3. *The relevant TSO shall specify the information exchange standards. The relevant TSO shall make publicly available the precise list of data required.*

NC HVDC- Article 51, Specify a number of minimum parameters to be exchange with the relevant system operator, at both ends of the HVDC system. Operational signals could be, but are not limited to: commands, set-points, measurements, status indication, alarms etc.

NC HVDC- Article 31, States that DC connected PPMs shall comply with the articles of NC RfG, where Art 14.5 (d) applies.

The need and relevance of the requirements is justified as well by:

NC RfG Preamble (21), page 3 states:

Adequate information exchange between system operators and power generating facility owners is a prerequisite for enabling system operators to maintain system stability and security. System operators need to have a continuous overview of the state of the system, which includes information on the operating conditions of power generating modules, as well as the possibility to communicate with them in order to direct operational instructions.

Link to ACER Framework Guidelines

ACER Framework Guidelines establish:

Paragraph 3.1: “... The network code(s) shall set out the procedures and requirements to coordinate and ensure information sharing between ... System operator and significant grid user ...”. “These procedures and requirements shall be defined with the agreement of all affected parties”.

Paragraph 3.2: “... The network code(s) shall set the requirement for every significant grid user to be able and obliged to provide the necessary real-time operational information to the DSO and TSO that their connection has significant impact upon. The network code(s) shall set the requirement for every significant grid user to be able to receive and to execute the instructions sent by the TSO and/or DSO, on a contractual basis or in critical operating state.”

ACER FWGL also states that the network code(s) shall define a harmonized standard according to which information shall be provided for grid connection at the connection point by TSO and DSO.

Similarly, the network code(s) shall define what information and technical data the significant grid user has to provide to the TSO or DSO to which it is connected and how this data is to be provided to ensure the operational security of the system.

Further information

ENTSO-E RfG and DCC Justification Outlines:

<http://www.acer.europa.eu/Media/News/Documents/121221-DCC%20-%20Justification%20Outlines.pdf>

<http://www.acer.europa.eu/Media/News/Documents/120626%20-%20NC%20RfG%20-%20Justification%20outlines.pdf>

Requirements for all categories of information to be exchanged are covered in data exchange methodology created under the scope of the SO GL as well as the NC ER.

ENTSO-E statement on the IEC61850 standard – link:

<https://www.entsoe.eu/about-entso-e/research-and-development/standardisation/IEC61850/Pages/default.aspx>

And the following report: SGCG/M490/G_Smart Grid Set of Standards, Version 3.1, Oct 31th 2014.

ENTSO-E statement on SysSmart activities – link:

<https://www.entsoe.eu/about-entso-e/research-and->

[development/standardisation/Pages/default.aspx](https://www.entsoe.eu/development/standardisation/Pages/default.aspx)

In order to create a seamless, efficient and secure information exchange it is necessary to apply harmonized standards at various stages, as the number of entities and/or parties is dramatically increased– TSOs, DSOs, RSO, Grid Users, Third party service providers etc.

The ENTSO-E recommended standards to be applied for market related and structural data exchange of information can be found on ENTSO-E website via the following link:

<https://www.entsoe.eu/major-projects/common-information-model-cim/Pages/default.aspx>

Recommendations on applicable standards for information security and best practice on handling confidential information can be found in the IEC 62351, ETSI X.501 as well as the ISO27000 standard series. The global best practice recommended to be applied can be found in the following report: Smart Energy Grid – Coordination Group Cyber Security & Privacy, SEG-CG/CSP-Draft Report-V07.pdf

INTERDEPENDENCIES

Between the CNCs	This document covers the published NC RfG; NC DCC and NC HVDC.
With other NCs / GLs	<p>The requirements set by NC RfG, NC DCC and NC HVDC on capability to exchange information in the time frames specified are focused on ensuring that new Grid Users connected to the network have the minimum required capability to comply with the SO GL and the NC ER, with respect to the list of information to be exchanged between the facilities and the relevant system operator.</p> <p>In SO GL, the information exchange requirements and methodology is covered in Title 2. Specifically the various categories of information to be exchanged structural, scheduled and real time data is defined in the SO GL Articles 41 – 53.</p> <p>In NC ER the information exchange requirements is specified in Chapter V. Specifically requirements is stated on access to neighbouring control areas information in case of restoration as well as requirements on voice communication.</p>

COLLABORATION

TSO – MS- NRA	Encourage cooperation between all involved parties
TSO – DSO- CDSO – facility owner	Cooperate to find practical and cost effective solutions to exchange the required information.