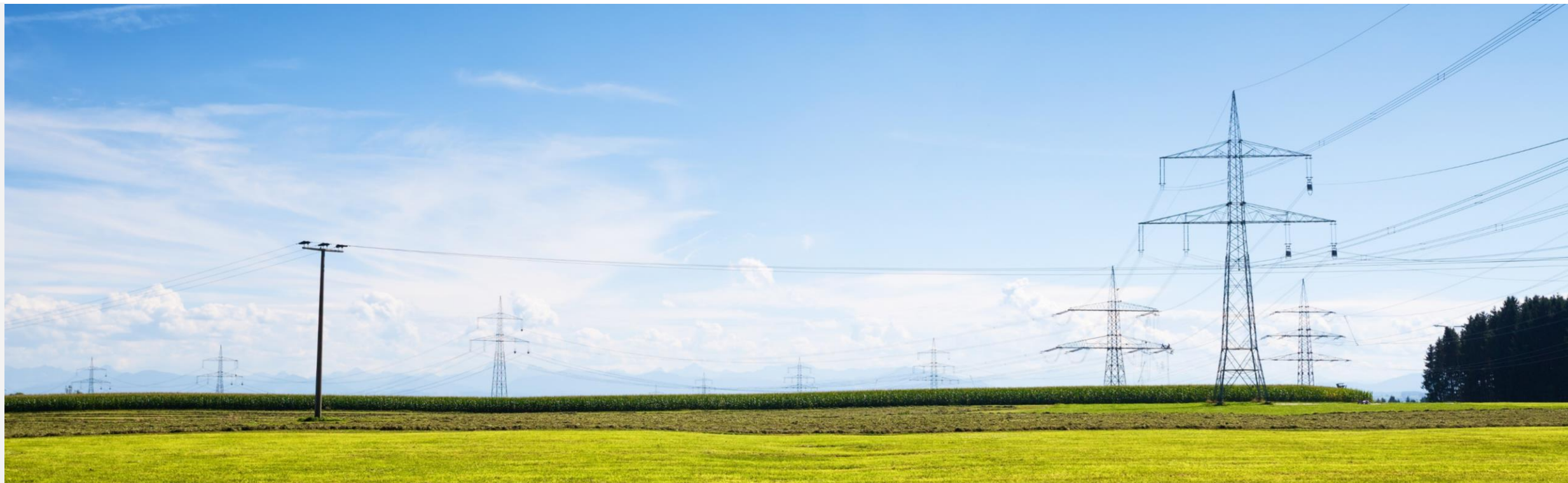


CNC Implementation – ENTSO-E updates

TOP.2

24th GC ESC meeting, 07 December 2021



Ioannis Theologitis, ENTSO-E

Proposed workshop on RoCoF related matters

Proposed workshop on RoCoF related matters

As part of September's GC ESC meeting minutes under the "Assessment of RfG RoCoF values"....

"The Chair then suggests that all these RoCoF aspects under such system split scenarios to be discussed in a dedicated workshop. ENTSO-E can lead the organization of this workshop when also these studies are prepared and are ready to be discussed, because useful comments can come from stakeholders as it has been the case in the past."

Actions taken:

- ENTSO-E presents in December's GC ESC meeting results from an internal investigation related to system splits and respective RoCoF observations
- ENTSO-E proposes a workshop with GC ESC member-organizations on **26 January 2022** or **1 February 2022**
- With respect to the points discussed during September's meeting, tentative agenda proposed is:
 - ENTSO-E will present about the grid incident on 24 July 2021
 - *Under this points we will try to clarify points of how the analysis and RoCoF calculations are conducted*
 - ENTSO-E will touch upon updates on minimum inertia aspects
 - ENTSO-E will present example(s) of national ongoing analysis regarding RoCoF
- The goal is to stir discussions but also channel them to specific objectives

Active Library / Monitoring File updates

Active Library / Monitoring File updates

Actions planned:

- ENTSO-E will review the current content of the Active Library and the Monitoring excel file during the first half of next year
- All stakeholders are invited to send any relevant updates/changes to ENTSO-E during the period of Q1 2022

Note: ENTSO-E plans to substitute the monitoring excel file with a more visual and user-friendly platform. Relevant communication will follow.

ENTSO-E's CNC Implementation Monitoring Report – 3rd edition

ENTSO-E CNC Implementation Monitoring Report 2021

Monitoring Report on Connection Network Codes Implementation



Final Version | 22 November 2021

1 Objective and Scope

1.1 Background of the Monitoring Report derived from the legal Framework

Since the previous Regulation (EU) No 714/2009 has been replaced by Regulation (EU) No 943/2019 the legal obligation by Article 8(8) of Regulation No 714/2009 for monitoring of the three Connection Network Codes (CNC) which are

- Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators (NC RfG),
- Commission Regulation (EU) 2016/1388 of 17 August 2016 establishing a network code on demand connection (NC DC),
- Commission Regulation (EU) 2016/1447 of 26 August 2016 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules (NC HVDC)

has been ceased.

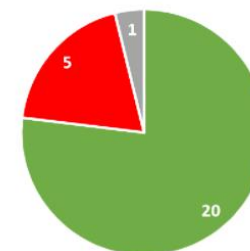
By taking into consideration the withdrawal of the legal framework for monitoring obligations the European Network of Transmission System Operators for Electricity (ENTSO-E) decided to continue with the annual CNC monitoring on a voluntary basis.

The present monitoring report 2021 addresses the identification of any divergences in the implementation of the European Connection Network Codes at national level by each member state.

The 2021 monitoring process deals with the Operational Notification Procedure (ONP) as implemented by the member states for each Connection Network Code.

Country-wise divergences between the national implementation of Network Codes regarding the ONP and the Connection Network Codes themselves are identified and presented in the following chapters of this Implementation Monitoring Report (IMR).

4.2.9 Is the information included in this section of the survey (Interim operational notification (ION)) publicly available in accordance with NC DC Article 22(3)?



■ Yes ■ No ■ Not published yet

				Answer
Belg				individually.
	Romania	Transelectrica - TEL	Yes	Yes
Bulg				
	Slovenia	ELES	Yes	Yes
Cro				
	Spain	Red Eléctrica de España	No	This will be defined individually on a project basis.
Cze Rept				
	Sweden	Svenska Kraftnät	Yes	As only internal connection procedures of HVDC Systems exists today, this is not implemented.
Est				
	Finland	Fingrid	Yes	Upon receiving an interim operational notification (ION), the power generating facility owner shall have the right to operate the power generating facility and generate power to the connection point for not more than 18 months.

ENTSO-E CNC Implementation Monitoring Report 2021

CNCs introduce a number of types of operational notifications to be issued by the relevant system operator:

- RfG (Type A generators): simple approach - installation document
- RfG (Type B and C generators): light approach - power generating module document
- RfG (Type D generators), DCC, HVDC: multi-stage approach
 - ‘energisation operational notification’ or ‘EON’: prior to energisation of its internal network
 - ‘interim operational notification’ or ‘ION’: allows them to operate by using the grid connection for a limited period of time and to initiate compliance tests to ensure compliance with the relevant specifications and requirements;
 - ‘final operational notification’ or ‘FON’: complies with the relevant specifications and requirements, allowing them to operate respectively a power-generating module, demand facility, distribution system or HVDC system by using the grid connection;
 - ‘limited operational notification’ or ‘LON’: had previously attained FON status but is temporarily subject to either a significant modification or loss of capability resulting in non-compliance with the relevant specifications and requirements.

ENTSO-E CNC Implementation Monitoring Report 2021

- The 2021 Implementation Monitoring Report reflects the **national implementation status of the Operational Notification Procedure**. The data were received from each Member State's TSO(s) during 2021.
- Only information which was **released for publication** by the relevant Transmission System Operators is shared in this Implementation Monitoring Report.
- Diagrams offer a statistical overview of the public availability of the requested information across Member States.

Updates on future IGDs

IGD Compliance verification

- General Guidance On Compliance Verification – Use of Simulation Models
 - Will be initiated in Jan 2022
 - Expected to be published in Q2, 2022
- General Guidance On Compliance Verification – Compliance Monitoring after operational notification
 - Will be initiated in Mar 2022
 - Expected to be published in Q4, 2022
- General Guidance On Compliance Verification – Compliance Testing and use of Equipment Certificates
 - Published – Nov 2021

“P=const behavior of some loads connected via power electronics”

ENTSO-E preliminary inputs

“P=const behavior of some loads connected via power electronics” 1/2

Assessment by ENTSO-E

- The arguments mention that „*the negative differential resistance decreases the effective short circuit power in the distribution network*” → aren't these only local phenomena? Maybe is more for the DSOs to reply
- The points refers that P=const also means that “the transmission system in a state near a voltage collapse has a higher risk of actually collapsing? → **This seems to be general enough and cannot be supported. Considerations about 1) which transmission system, 2) at what operating state, and 3) what loading conditions need to made**
- The effectiveness of power system stabilising (PSS) decreases via the chain of command: excitation of synchronous generators at transmission and sub-transmission level, Q-control of HVDC stations and other FACTS installations -> voltage level in EHV+HV -> voltage level in MV+LV -> ohmic loads convert voltage modifications in active power modifications to provide damping power → **The effectiveness of PSS installed at SPGMs is not directly affected neither by the presence or HVDC stations nor of FACTs. If a PSS is carefully tuned, it will serve the purpose of its design, which is to damp electromechanical models of oscillations. If the grid connection conditions of the SPGM change to a degree that the tuning assumption are not anymore valid, then the PSS should be retuned. Moreover, the participation factor of a specific SPGM where PSS is activated depend on many other factors, like the location of the generation in the system with respect to the modes which it has to damp**

“P=const behavior of some loads connected via power electronics” 2/2

Assessment by ENTSO-E

- **(continue)...** cases that the P-Const operation of loads in the medium voltage might affect the PSS have not been revealed. The only case interesting could be if SPGMs are sitting in the middle of transmission corridors, there it might be the case that Q variations might affect. However, all those are to me tuning problems that could be fixed locally
- As for the question if it can be cross border issue → **generally all local issues could be cross border if associated with tripping of units or transmission lines**