
Roadmap on guidance for frequency stability requirements

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Monitoring Project Team / WG CNC

28 February 2017

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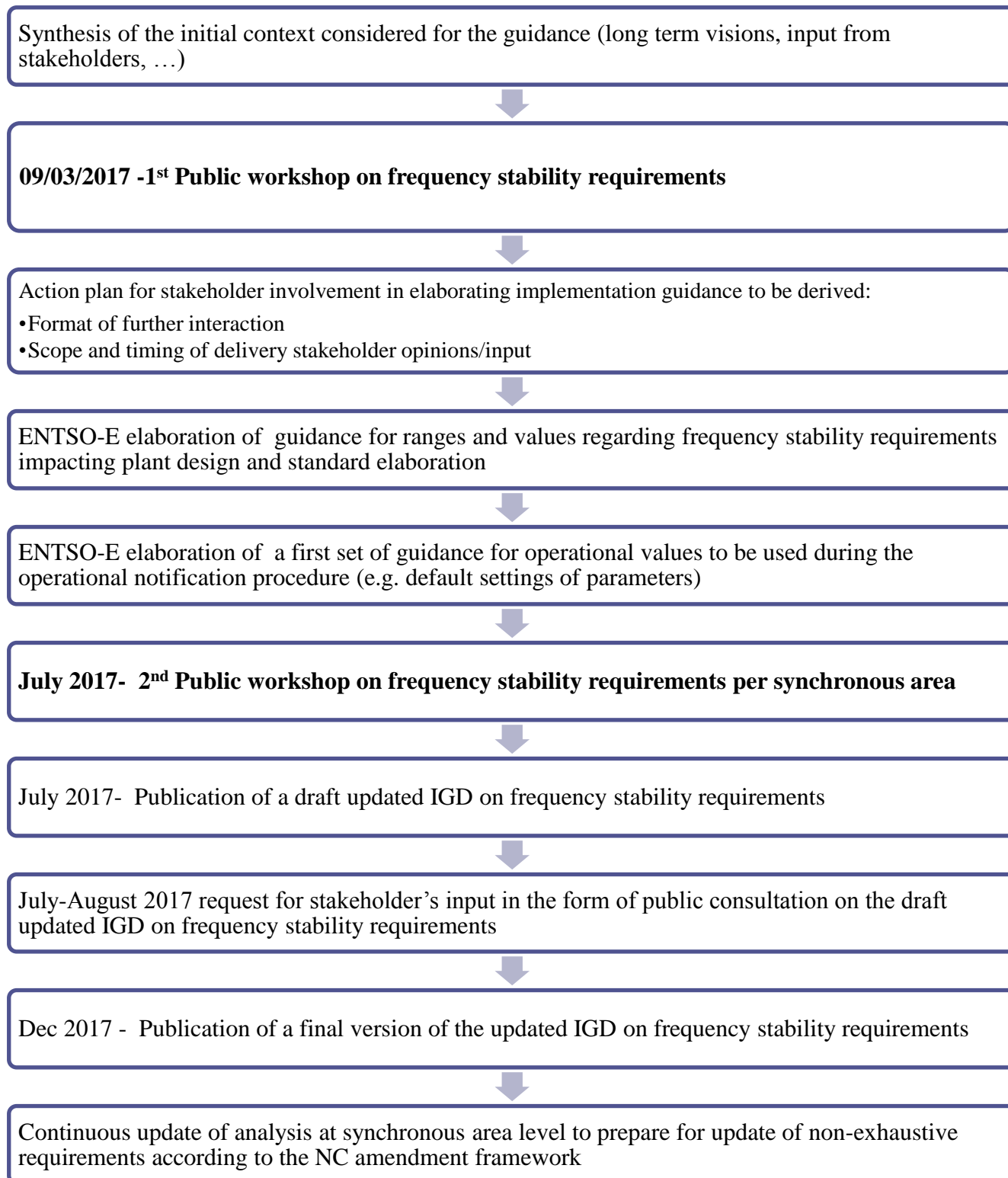
2. Objectives

The main goals of this roadmap are to:

1. Ensure coordinated approach at synchronous area level of the national implementation on frequency related parameters
2. Ensure transparency on the approaches, processes and decisions taken in each country
 - Timing of implementation guidance must be compatible with the timing of each country's national implementation process to be informed by this guidance. The overall timing is driving by the deadlines of NC RfG, which was the first connection code to enter into force.
 - Timing for the elaboration of European standards is also to be considered.
 - Coherence between Connection and Operation code needs to be ensured.

3. High Level roadmap on guidance for frequency stability parameters

The flowchart below covers the main steps for the guidance procedure with regards to frequency stability,



4. Supporting information on the roadmap

The roadmap on guidance for frequency stability parameters entails:

- The first step is to define the hypothesis for the long-term assessment of system needs (e.g. TYNDP visions) and also to collect stakeholder input (expectation, technical constraints, etc.). It includes collection of existing and ongoing studies at synchronous area, regional or national level.
- The public workshop shall explain ENTSO-E's approach on implementation guidance. It shall set the scope, detail on which paragraphs of the Connection Codes Regulations guidance will be provided and propose coordinated ranges/values or methodologies to be recommended for national implementation.
- The elaboration of guidance follows then. It will make use of existing studies and may initiate additional ones taking into account the time constraints for providing implementation guidance. The objective of CNC implementation is to define exhaustively technical capabilities, which are to be understood as features with relevance to plant design. Depending on the matter such a feature is either a range, which can be a sub-range of the range defined by the NC or a definite value of a parameter. In case of ranges, they may include initial (default) values for parameters, which can be reselected as appropriate using the capabilities defined at CNC national implementation. For installations of large volumes a pragmatic approach for parameter settings and their changes is required. Therefore particular attention shall be paid on the long-term perspectives when defining initial (default) values considering in order to limit the need for reselections the value.

Implementation of technical capabilities shall be distinguished from determination of parameters with relevance to operational performance which will be defined during implementation of operational codes/guidelines, before plant commissioning or at operational timescales.

- The next step is to present these first results of coordination at synchronous area level to the stakeholders and collect feedback.
- Based on this feedback ENTSO-e will update the IGD on frequency related parameters with recommendations for values or methods to be implemented at national level. The IGD is expected to hold different sections for each of the synchronous areas.
- ENTSO-E will seek for more detailed feedback from the stakeholders on the updated IGD. With respect to transparency, a public consultation will be launched.
- It is expected that the final document shall be available by December 2017 to inform national processes (the RfG deadline requires TSOs to submit a proposal on the national implementation to the competent authority by mid-may 2018)
- Finally, studies will continue to be performed at synchronous area level and the IGD may be further updated based on evolution of the expected system mix and evolution of the technologies.

5. 1st Public workshop on frequency stability requirements

This workshop is associated with the connection codes (RfG, DCC and HVDC) implementation. It aims at guiding the national implementation processes of each implementing country on choosing the appropriate ranges and values for requirements of each connection code related to frequency stability. In this event ENTSO-E members' experts on system planning and operation with a strong knowledge of system stability aspects will present the specific characteristics and challenges for each synchronous area.

The topics that will be dealt are:

- Future system challenges ahead with high penetration of non-synchronous generation.
- Specific challenges on frequency stability and related studies per synchronous area.

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- What are specific challenges on frequency stability requirements and its parameters for (large) synchronous generators; non-synchronously connected generators (Power Park Modules) and HVDC; electricity generation as a by-product (e.g. CHP and Industrial generation).
 - Which feedback/input shall be given for consideration in studies and parameter determination?

The following requirements are considered to be in the scope in the workshop:

- FSM-Requirements.
- LFSM-O/-U-Requirements.
- Time of operation at frequencies, where not yet defined exhaustively.
- RoCoF withstand capability.
- Admissible active power reduction at low frequencies.
- Frequency ranges of automatic (re-)connection and gradient of active power increase.
- Synthetic inertia.