



Fault Ride Through Working Group Terms of Reference

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Overview

Recent interactions between the TSO and a number of generators has highlighted that there may be a lack of clarity on the requirements the fault ride through capabilities in the Grid Code and/or the measures used to identify non-compliance. In addition the TSO has completed a significant series of studies to examine the impact of high penetration of windfarms on the operation of the power system. Because of these recent issues and in light of the renewable policy targets the TSO suggested to the CER that a review of these standards would be timely. This draft terms of reference is for discussion/approval at the next Grid Code Review Panel meeting.

Scope of Working Group

Current fault ride-through requirements (i.e. FRT, the ability of a generating unit to remain synchronised to the power system during and following a transmission system fault) for synchronous generators connecting to the Irish Transmission Network are addressed by Clause CC.7.3.1.1 of the Grid Code. The Grid Code states that all synchronous generating units connecting to the Transmission System will have FRT capability of at least 200ms for a reduction in connection point voltage of up to 95%.

It is proposed that a working group of the Grid Code be established to review the appropriate requirements for Fault Ride Through including as a minimum certain characteristics related to the transmission network and technological aspects such as control and protection systems, and generator design, such as, but not limited to:

- Generation technology dependent variation in FRT capability;
- Fault clearance times for extra high voltage (EHV) and High Voltage (HV) protection systems and the impact of slow fault clearances on transmission system security;
- Coordination of fault clearance for all centrally controlled generation;
- Application of voltage profiles to FRT;
- Assessment of credible contingencies at different transmission voltage levels i.e. assessment of historical data and likely changes;
- Testing and evaluation of synchronous generating units FRT through:
 - disconnection and reconnection of auxiliary supply;
 - dynamic simulation; and
 - online monitoring;
- Active power recovery and damping of power oscillations following clearance of the fault; and
- Consideration of network fault levels for defining the FRT requirements of generating units
- Potential, unintentional impacts on generation type and / or location, financial implications

In addition to the above, the review needs to consider the requirements of the transmission network not only at present, but also moving forward into the future. Ireland is committed to generating 40% of energy through renewable technology by 2020. This presents a significant challenge to the system in which all generator units need to contribute. Consequently, the review should also consider:

- Necessary stability of large synchronous generating units currently providing critical auxiliary services to the transmission network;
- Review of the Facilitation of Renewables Studies and the potential impact on system security; and
- Changes in transmission system and generation design.

Finally, and in line with good utility practice, EirGrid would propose to commission a review of other international Grid Codes, to ascertain the current standard in approaching FRT in other transmission networks. The terms of reference, to be developed and agreed by the working group, should include as a minimum:

- How the minimum standard was established i.e. what are the operating characteristics of the particular transmission network that led to the particular definition of FRT; has the value been changed and if so why
- Voltage levels and length of lines
- Establish the differences, if any, in FRT requirements for interconnected systems and island networks;
- How other Grid Codes propose to deal with a high penetration of asynchronous generation expected through the proliferation of wind turbine generating systems;
- How other countries assess FRT for connection offers;
- The consultant should nominate countries to be compared and the WG would need to review this selection.

Deliverables

- Any changes to CC.7.3.1.1 with supporting documentation: history, technical justification, impacts
- Principles document regarding assessment of Grid Code Compliance Pre and Post Commissioning
- Information Provision: what data currently provided where and any additional information required by IPP at design stage
- International Best Practice Report
- EirGrid Paper on the apparent inconsistency in fault clearance times between the Grid Code and the Transmission Planning Criteria

Administration of the Working Group

The working group will be administered as follows:

ESTABLISHMENT AND OBJECTIVES

The Working Group is established by the chairman and members of the Grid Code Review Panel (GCRP).

The objectives of the Working Group are to:

- a) generally discuss the current Fault Right-Through (FRT) requirements in the Grid Code;
- b) discuss possible changes to the Grid Code arising from such discussions;
- c) make and publish recommendations.

MEMBERSHIP

The Working Group shall consist of:

- a) a chairman appointed by the TSO;
- b) a secretary appointed by the TSO;
- c) each member of the GCRP is entitled to sit on the Working Group; and
- d) Technical advisors, experts or Users who the GCRP consider appropriate for the working group.

It is expected that each member of the working group will reasonably attend each meeting and actively contribute to the working groups as appropriate.

MEETINGS

The Working Group shall meet once per month or at such other regular scheduled times as it may decide. The normal venue for meetings shall be at the TSO's premises, details of which shall be circulated to all the members of the Working Group by the secretary prior to the meetings. The views of Working Group shall not be the view of the GCRP unless discussed and agreed by the GCRP. The Working Group shall report to the GCRP at each meeting of the GCRP as to the progress of the working group.

When the work of the Working Group is complete, and following final review by the GCRP, the TSO shall apply to the Commission for a revision of the Grid Code and in doing so shall include the original proposal and the views and considerations of the GCRP.

NOTICE OF MEETINGS

All meetings shall be called by the secretary on at least ten (10) business days written. The notice of each meeting shall be given to all members of the Working Group and shall contain the time, date and venue of the meeting, an agenda and a summary of the business to be conducted.

MINUTES

The secretary shall circulate copies of the minutes of each meeting to each member of the Working Group as soon as practicable (and in any event within ten (10) Business Days) after the relevant meeting has been held. Each member shall notify the secretary of the member's approval or disapproval of the minutes of each meeting within ten (10) Business Days of receipt of the minutes. A Member who fails to do so will be deemed to have approved the minutes.

If the secretary receives any comments on the minutes, the secretary shall then include those aspects of the minutes upon which there is disagreement into the agenda for the next meeting of the Working Group.