

SONI Limited

Dynamic Modelling

Grid Code Amendments Consultation Paper

12 December 2013

1. Introduction

- 1.1 The purpose of this consultation paper is to obtain views on proposed Grid Code modifications in respect of the requirements on Users to provide dynamic models of their Plant and Apparatus to SONI. This consultation paper follows on from presentation and discussions held at the Joint Grid Code Review Panel meetings on 4 December 2012 and 1 May 2013, both at the Clarion Hotel, Dublin and a joint workshop on 30 July 2013 at the Crowne Plaza Hotel in Dundalk. A subsequent presentation at the Joint Grid Code Review Panel meeting on 11 September 2013 at the Radisson Blu Belfast discussed the outcomes of the workshop and summarized the joint TSO position on this subject. EirGrid presented a proposed modification to the Ireland Grid Code on 11 September 2013 to their Grid Code Review Panel meeting. SONI undertook to consult on a proposed modification to the Northern Ireland Grid Code.
- 1.2 The proposed redline amended texts of each relevant Grid Code section showing the changes made to the existing version can be found in the “Information Centre” section of SONI’s website. This consultation paper sets out a high-level summary of the proposed changes to the Grid Code and SONI would welcome comments from Users on any aspect of these amendments.
- 1.3 The deadline for the submission of comments is close of business 24 January 2014.

2. Section by Section Review

2.1 Planning Code

The development of a new Appendix D comprises the substantive change in this modification and describes the requirements on Users to provide representative models and supporting documentation for their connected equipment. Minor textual amendments have also been included to address the consequential housekeeping aspects.

2.1.1 General (PC6.3.2)

A minor textual amendment has been made to this existing clause, introducing the requirement for Users to provide the modelling data as part of their Planning Data submission. It highlights that this additional requirement is detailed in Appendix D.

2.1.2 Appendix A Planning Data – Connections to the Transmission System (PC.A2.1.4)

Appendix A of the Planning Code covers the requirement for Users to submit Standard and Detailed Planning Data in respect of Connections to the Transmission System. This new section has been included to specify that Users must also provide the modelling requirements described in Appendix D.

2.1.3 Appendix B Planning Data – Connections to the Distribution System (PC.B2.1.3)

This requirement is similar to 2.1.2 above, but applies to Distribution System Connections.

2.1.4 Appendix D - Scope (PC.D2.1)

The requirement to provide models and supporting information applies to the following Users classifications:

- Generators in respect of Generating Units connected to or seeking connection to the Transmission System,

- Generators in respect of their Centrally Dispatched Generating Units and Controllable Wind Farm Power Stations connected to or seeking connection to the Distribution System,

- Large Demand Customers,

- Interconnector Owners.

2.1.5 Appendix D - General (PC.D2.2)

This section of Appendix D establishes some general principles for the models that all Users in scope are required to provide SONI. Models must accurately represent the behaviour of Users' Plant and Apparatus. Fundamentally, models provided to SONI are required to facilitate assessment of a connection's impact on the Transmission System. These models must demonstrate the performance at the respective connection point to the Transmission or Distribution System. The impact of communication and processor

delays must also be adequately represented. Generators with WFPSs are required to provide a single lumped model to represent an entire Wind Farm installation.

2.1.6 Appendix D - Model Capability (PC.D3)

This section has been included to describe the two types of power system analysis which SONI need to undertake, using the models supplied by Users:

A balanced, root mean square, positive sequence time domain studies, and

A three phase electromagnetic transient and harmonic analysis.

Further description of SONI's analysis requirements has been included to ensure that User models are fit for purpose but do not include additional performance capabilities which SONI may not require.

2.1.7 Appendix D - Model Documentation and Source Code (PC.D4)

This section describes the requirements for Users to provide adequate supporting documentation with their models. Such documentation is required so that models can be redeveloped if SONI implements versions updates of its present power system analysis software applications or migrates to alternative software platforms. A clear explanation of the functionality of the model including the steps required to initialise and utilise the model is also vital. Users may wish to provide SONI with source code but this is not obligatory.

SONI has intentionally omitted any specific references to the software formats for models. This approach has been proposed to avoid the need for Grid Code modification in the event of a software format change.

The proposed drafting in this section provides SONI with the capacity to request further information from Users in certain specified circumstances.

2.1.8 Appendix D - Confidentiality (PC.D6)

This section clarifies SONI's obligations to maintain the confidentiality of Users' proprietary information. This aligns with Condition 11 "Restriction on Use of Certain Information" of the TSO Licence. Condition 11 permits SONI to share Users' confidential information with other parties in order to comply with other conditions in the TSO Licence. Such parties include, but are not limited to EirGrid (the Other TSO), NIE (the DNO) and other third parties which SONI may engage to undertake analysis on its behalf.

In certain circumstances, equipment manufacturers may not wish to provide models to SONI via the respective User. The proposed Grid Code modification provides the option for equipment manufacturers to provide models directly to SONI under the conditions of a standard confidentiality agreement supplied by SONI. However, the ultimate obligation to provide models and supporting information to SONI would remain with the User.

2.1.9 Appendix D - Provision of Information (PC.D7)

This section covers the requirement for Users to update their models and supporting information as required under the Planning Code. This ensures that SONI continually has access to the most up to date information on Users' plant and apparatus, prior to connection and throughout the operating life of the connection.

2.1.10 Appendix D - Validation (PC.D8)

A paragraph covering model validation requirements has been included since SONI must have confidence that User models reflect the actual performance of Users' plant and apparatus. Model validation is achieved through type test certification, site commissioning tests and ongoing monitoring. If SONI observes performance which deviates from actual performance, Users may be required to provide updated models and associated information in a timely manner. Proposed changes to Users' plant and apparatus that may materially impact operation and control must be communicated to SONI to facilitate an adequate impact assessment.

2.1.11 Appendix D - Software Environment

This section describes User obligations to provide updated models following a software environment change by SONI. It would be undesirable to include references to specific power system analysis software applications or versions within the Grid Code. This information would be made available to Users via the SONI website.

2.2 Data Registration Code

The Data Registration Code has been amended to include a requirement for 'Modelling data of the **Users Plant** and **Apparatus** at the **Connection Point**'.

3. **Next Steps**

- 3.1 The consultation period will run for 6 weeks and all responses must be received by close of business on 13 January 2014. Should Users have any queries, these should be

addressed to Brendan Woods at SONI (Email brendan.woods@soni.ltd.uk or phone 02890707542).

- 3.2 At the end of the consultation period, SONI will review the submissions from Users and, in accordance with Condition 2 of its Licence to Participate in the Transmission of Electricity, will send to the Northern Ireland Authority for Utility Regulation (the Authority):

A report on the outcome of the consultation and SONI's subsequent review;

The proposed revisions to the Grid Code which SONI, acting reasonably, thinks fit for the objectives of the Grid Code, referenced in Condition 16 of the SONI Licence and;

Any written representations and objections from electricity undertakings or the Republic of Ireland TSO (including any proposals by such parties for the revisions to the SONI Grid Code not accepted by SONI following its review) arising during the consultation process and subsequently maintained.

- 3.3 Following the end of the consultation period and discussions which may be held with the Authority, revisions to the Grid Code will be finalised and published on the SONI website, following formal approval by the Authority.