

Review of the Northern Ireland Transmission System Security and Planning Standards

Consultation

21 April 2023



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Introduction

Under Condition 20 of its Licence to Participate in the Transmission of Electricity (the Licence), SONI is responsible for the planning of the transmission system in accordance with the Northern Ireland Transmission System Security and Planning Standards, the Distribution System Security and Planning Standards, the Grid Code and the Transmission Interface Arrangements, as appropriate to the purpose under consideration, and in accordance with its role under the Transmission Interface Arrangements, and taking into account the Transmission Owner's obligations in relation to developing and maintaining the transmission system in accordance with the Transmission Owner Licence.

Under Condition 20 of the Licence SONI is also required to periodically review the Northern Ireland Transmission System Security and Planning Standards in consultation with the Transmission Owner and, where they are likely to be materially affected, the Republic of Ireland System Operator and other electricity undertakings.

SONI has identified and reviewed those elements that are specific to the Licence and propose to make changes as set out in this report. The purpose of this report is to set out the proposed changes and seek feedback from stakeholders.

Scope

SONI is presently carrying out a full review of the Northern Ireland Transmission System Security and Planning Standards. Any proposed changes will be consulted upon later this year following the conclusion of the review. The most recent version of the Northern Ireland Transmission System Security and Planning Standards is available to download on the SONI website¹.

During the course of the review, it has become apparent there is an urgency to update the criteria regarding the step change voltage limits. Presently, the criteria as set out in the Northern Ireland Transmission System Security and Planning Standards is aligned with Engineering Recommendation (ER) P28. This has been superseded with ER P28/2. It has been decided to hold a separate consultation into this change ahead of the completion of the full review.

This review and consultation is therefore limited to updating the voltage step criteria with those specified in ER P28/2.

¹ TSSPS NI: <https://www.soni.ltd.uk/media/Northern-Ireland-TSSPS-September-2015.pdf>

Review of the Voltage Limits in Planning the Onshore Transmission System

Table 6.2 in the TSSPS sets out the voltage step change limits allowed for secured faults and switching events. The table is reproduced below.

Table 1: reproduction of table 6.2 from the NI TSSPS

Transmission secured fault or switching event	Voltage fall	Voltage rise
Following the loss of a single circuit	- 6%	+ 6%
Following the loss of double a circuit overhead line	- 10%	+ 6%
Operational switching less frequent that specified in ER P28	- 3%	+ 3%
Operational switching covered by ER P28	In accordance with ER P28	

The existing voltage limits standard is set out in **Appendix A**.

Comparison with NIE Networks

A review by NIE Networks of the distribution planning standards resulted in ER P28/2 replacing the use of ER P28/1 in the Distribution System Security and Planning Standards. It is proposed that for consistency across the whole system, the TSSPS should be updated to adopt the use of requirements set out in ER P28/2.

Updated Transmission Standards

To provide for the standards necessary to cover power quality issues, it is proposed to replace any reference to ER P28 with one to ER P28/2 and apply voltage step change limits with those described in ER P28/2.

The proposed voltage limits standard is set out in **Appendix B**.

Next Steps

Stakeholders are invited to express a view on the proposed changes to the Northern Ireland Transmission System Security and Planning Standards set out in this paper. Responses should be received by SONI no later than **17:00 on Friday 19 May 2023**. The consultation is available online and responses can be submitted there. Should any stakeholder prefer to respond in writing, responses should be addressed to:

Michael McClure

SONI

12 Manse Road

Belfast

BT6 9RT

Email: michael.mcclure@soni.ltd.uk

During the consultation period, should any stakeholder:

- have any specific queries on any aspect of this document;
- have any specific queries on the proposed changes; or
- require a meeting with SONI.

They should contact SONI as set out above.

SONI will collate all responses received to this consultation as part of its report to the Utility Regulator.

Appendix A: Current TSSPS

6 Voltage Limits in Planning the *Onshore Transmission System*

Voltage Limits in Planning Timescales

6.1 The *pre-fault planning voltage limits* on the *onshore transmission system* are as shown in table 6.1

Table 6.1: Assumed *pre-fault planning voltage limits*

Nominal voltage	Minimum	Maximum
400 kV	370 kV	410 kV Note 1
275 kV	261 kV	289 kV
110 kV	105 kV	120 kV

Notes

1. 420 kV (+5%) is permissible for no longer than 15 minutes

6.2 A voltage condition on the *onshore transmission system* is unacceptable in planning timescales if, after either

6.2.1 a *secured event*, or

6.2.2 operational switching,

and the affected site remains directly connected to the *onshore transmission system* in the *steady state* after the relevant event above, either of the following conditions applies:

6.2.3 the voltage step change at an interface between the *onshore transmission system* and a customer exceeds that specified in table 6.2, or

6.2.4 there is any inability following such an event to achieve a *steady state* voltage as specified in table 6.3 at *onshore transmission system* substations or GSPs using manual and/or automatic facilities available, including the switching in or out of relevant equipment .

6.3 The *steady state* voltages are to be achieved without widespread post-fault generation transformer re-tapping or post-fault adjustment of SVC set points to increase the reactive power output or to avoid exceeding the available reactive capability of generation or SVCs.

6.4 The *voltage step change* limits must be applied with load response taken into account.

Table 6.2: The *voltage step change* limits in planning timescales

Transmission secured fault or switching event	Voltage fall	Voltage rise
Following the loss of a single circuit	- 6%	+ 6%
Following the loss of a <i>double circuit overhead line</i>	- 10%	+ 6%
Operational switching less frequent than specified in ER P28	- 3%	+ 3%
Operational switching covered by ER P28	In accordance with ER P28	

Table 6.3: The steady state post fault voltage limits in planning timescales

Nominal voltage	Minimum	Maximum
400 kV	380 kV (95%) Note 1	410 kV (102.5%) Note 2
275 kV	248 kV (90%)	289 kV (105%)
110 kV	Note 3	115 kV (105%)
< 110 kV	Note 3	105%

Notes

1. It is permissible to relax this to 360 kV (-10%) if:
 - the affected substations are on the same radially fed spur post-fault;
 - there is no lower voltage *interconnection* from these substations to other *supergrid* substations; and
 - no auxiliaries of large *power stations* are derived from them.
2. It is permissible to relax this to 420 kV (+5%) if lasting for no longer than 15 minutes.
3. It shall be possible to operate the lower voltage *busbar* of a BSP at 100% of nominal voltage after tap changing.

Appendix B: Proposed changes to TSSPS

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6.2.3 the voltage step change at an interface between the *onshore transmission system* and a customer exceeds that specified in table 6.2, or

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Table 6.3: The *steady state* post fault voltage limits in planning timescales

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