

SPID 07_2024 Synchronous Condenser Units (SCU) Modification

Grid Code Modification Report

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Summary

This report and the supporting documentation follows on from a public consultation on the proposed Synchronous Condenser Units (SCU) Modification to the SONI Grid Code and our ensuing engagement with industry stakeholders. This modification would establish SCUs as a distinct unit type, with SCU Operators being established as a distinct User description.

Since both SONI and EirGrid have developed modification proposals for SCUs, we focused our engagement with industry by way of the Joint Grid Code Review Panel. This facilitated the alignment of our technical requirements across both jurisdictions for this new unit type. This modification also includes proposed changes to the Scheduling and Dispatch Codes which are areas under common governance. The modification was presented and discussed at several Joint Grid Code Review Panel (JGCRP) meetings. Both TSOs have engaged openly with industry to ensure that we provide a suitable Grid code standards for SCUs whilst also recognising the specific constraints of providing the technology in a cost-effective manner.

SONI consulted on the SCU Modification proposal for a period of 7 weeks from 20/12/2024 until 07/02/2025. We received feedback to our consultation raising the same concerns as were highlighted to both TSOs via the JGCRP. Over the course of several months, SONI proactively engaged with stakeholders in conjunction with EirGrid with the aim of resolving the outstanding concerns and arriving at an agreed position. Alternative options were openly discussed with industry representatives. They ultimately agreed that we retain the TSOs' original technical requirements in our modification proposals.

At the time of the public consultation, the TSOs included updates to the Scheduling and Dispatch Codes that reflected the participation of SCUs in energy markets. This was based on the best information available to the TSO Grid Code teams at the time and meant that SCUs would be required to submit negative Physical Notifications (PNs). We were subsequently advised by the Scheduling and Dispatch Programme (SDP) that SCUs would not be required to submit PNs. The Grid Code modification proposal was updated to reflect the latest position. SONI did not conduct further public consultation on these changes to the SDC since they are necessarily driven by the market design and are not likely to be materially impacted by further consultation.

The updated proposal was presented to the JGCRP meeting on 26 June 2025. Each of the jurisdictional GCRP meetings agreed that the respective modifications should be submitted to the respective Regulatory Authorities for consideration and approval.

The SONI draft modification was subsequently amended to correct some clause numbering inconsistencies within the SDC1 section. There was clear misalignment with the equivalent clauses in the EirGrid Grid Code. This misalignment has been corrected in the attachments to this report.

The red-line and green-line versions of the proposed SDC modification are submitted alongside this report as supporting documentation, with all supporting documentation for the modification proposal listed in Appendix A.

The modification proposal is submitted for UR approval.

Modification Proposal: SCU Modification

Overview

This modification proposes the incorporation of SCUs into the Grid Code. This modification proposal also includes all changes required under the Scheduling and Dispatch Programme and aligns with the requirements within the Trading and Settlement Code.

Background

The Synchronous Condenser Grid Code Implementation Note was published in October 2022. In the absence of a specific modification for SCUs, this note provided guidance on how the Grid Codes would be applied to SCUs connection applications in Ireland and Northern Ireland. The Implementation Note did not propose any Grid Code modifications at that time. It allowed for the submission of stakeholder feedback on its contents with the intention of explicitly implementing SCUs into the Grid Codes at a future date.

The TSOs' presented their initial views on the integration of Synchronous Condenser Units (SCUs) into the Grid Codes as a new User type at the Joint Grid Code Review Panel Meeting (JGCRP) of 20th March 2024.

Draft red-line and green-line versions of both the SONI and EirGrid Grid Codes demonstrating SCU incorporation were circulated to JGCRP members following that meeting. The JGCRP members were asked to submit feedback on the documentation by 3rd May 2024. Upon receiving feedback from industry, the TSOs issued a response document on 26th July 2024 and requested further feedback by 16th August 2024. After TSO review of the additional feedback, further engagement was required between the TSO, industry and OEMs to solidify the voltage regulation requirements for SCUs, which was communicated to JGCRP members at the JGCRP meeting on 24th September 2024.

These SCU modification proposals for the SONI and EirGrid Grid Codes were presented to the JGCRP meeting on 3 December 2024. The respective Grid Code Review Panels supported the progress of the modification proposal towards approval. SONI conducted a public consultation in accordance with the SONI Grid Code Constitution which ran from 20 December 2024 to 31 January 2025. This was extended to 7 February 2025 at the request of UR.

Feedback to the consultation was received. This focused on concerns over the voltage / reactive power profile. Similar feedback was provided to EirGrid via their GCRP membership. Both EirGrid and SONI proactively engaged with the relevant stakeholders with the aim of addressing the concerns raised whilst ensuring the integrity of the Grid Code requirements. These discussions comprised a number of conference calls and email exchanges with SCU developers and OEMs. At the end of these discussions, the industry stakeholders agreed that the original technical requirements should be retained.

The proposed SONI Grid Code modification which was put out for public consultation assumed that SCU Operators would be required to submit Physical Notifications. This was the best information available to the TSO Grid Code teams at the time. It subsequently came to light via the Scheduling and Dispatch Program (SDP) that SCUs would not participate in the energy markets. As a result SCU Operators will not be required to submit Physical Notifications as part of their Technical Offer Data (TOD). The modification of the Scheduling and Dispatch Codes sections were amended in order to align with this approach. Since this variation of the SDC sections of the modification proposal is simply aligning the data submission requirements with the equivalent Trading and Settlement Code modification, we believe that there is no merit in seeking feedback via further public consultation.

The updated drafts of the SCU Grid Code modifications were presented by both TSOs to the JGCRP meeting on 26 June 2025. The subsequent jurisdictional GCRP meetings on this date agreed that these modification proposals should be submitted to the respective regulatory authorities for their consideration and approval.

In the case of the SONI Grid Code modification, it subsequently came to light during final review, that the numbering of several clauses within SDC1 were incorrect. It appears that this misalignment had occurred at some point prior to the modification under consideration. This impacts an area of the Grid Code under common governance so we are keen to restore alignment the correct between the SDC sections within the EirGrid and SONI Grid Codes. This inconsistency has been corrected in the redline and greenline drafts which accompany this report.

We propose to present a separate SCU Settings Schedule at the upcoming SONI GCRP meeting in September 2025 as a separate modification proposal. This will detail the signals and testing requirements for SCUs connecting to the NI Transmission Network.

Analysis & Opinion

This modification will ensure that all remaining sections of the SONI Grid Code align with the requirements of the SCU Grid Code Implementation Note and account for relevant feedback from industry representatives including OEMs and SCU developers. The provisions of this Grid Code modification proposal are intended to set minimum technical requirements for SCUs but they do not preclude SCU developers from offering enhanced capabilities under the provisions of separate contractual arrangement for system services.

Conclusion

This modification proposal builds on the provisions of the SCU Implementation Note by putting forward specific requirements for SCUs which reflect their specific characteristics, capabilities and limitations. It also reflects the requirements for the scheduling and dispatch of SCUs.

~~This modification will ensure that Grid Code requirements for Battery ESPS low frequency response align with the requirements of Article 15 of Commission Regulation (EU) 2017/2196. Since the original submission, further modifications have been added to this proposal to:~~

~~Correct a conflicting clause within the Scheduling and Dispatch Code 1 (SDC1.4.8.7) and~~

~~Include specific technical requirements to ensure the disconnection of ESPSs acting as Demand when they are unable to automatically change over to Generation and there is a sustained frequency of less than 49.5 Hz.~~

Consultation responses to proposed SCU Modification

SONI received one response to this proposed modification. This submission reflected a similar representation by a member/observer of the EirGrid GCRP. It reflected the concerns raised regarding the drafting in EirGrid's proposed SCU modification. As previously mentioned, these concerns were focused on the voltage range over which an SCU would be required to provide full positive and negative reactive power capability. It also queried the way in which an SCU is declared as available or not. In response to this formal feedback to our public consultation, SONI actively engaged with this stakeholder and OEM representatives to understand the concerns raised and resolve the issue at hand.

Following these discussions, the parties agreed that we should proceed with the voltage / reactive power requirements as originally presented in the modification proposals for both Grid Codes.

Assessment against Grid Code Objectives

This modification supports the Grid Code objectives by enabling the efficient operation of the Northern Ireland transmission system. The intent of this modification is to ensure that the Grid Code aims sets out appropriate minimum technical requirements. It does not preclude the provision and contracting of higher standards for the provision of system services to SONI.

The proposed modification supports the objectives of the Grid Code as it;

- will permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;
- facilitates competition;
- promotes the security and efficiency of the Northern Ireland electricity transmission systems; and
- promotes efficiency in the implementation and administration of the Grid Code arrangements.

SONI requests for Utility Regulator approval of SCU Modification

SONI recommends that the Utility Regulator approve this Grid Code modification in its entirety. SONI would highlight that this modification impacts on sections of the Grid Code which fall under common governance.

SONI believes that the approval of this modification will:

- Ensure the accuracy of the Grid Code
- Ensure that the SONI Grid Code is suitable for direct application to SCUs and SCU Operators.

Proposed Implementation Date

SONI would suggest that the implementation date is coordinated with the Regulatory Authority in Ireland since this proposed modification impacts on areas of the Grid Code under common governance.

Appendix – Supporting Documentation

- SONI Consultation on Synchronous Condenser Units (SCU)
- Response to the SONI Consultation
- SPID_07_2024_SONI_SCU_Grid Code_Mods_(GreenLine)_based_on_Dec23_V2
- SPID_07_2024_SONI_SCU_Grid Code_Mods_(RedLine)_based_on_Dec23_V2