

MODIFICATION PROPOSAL FORM			
Proposer <i>(Company)</i>	Date of receipt <i>(assigned by Secretariat)</i>	Type of Proposal <i>(delete as appropriate)</i>	Modification Proposal ID <i>(assigned by Secretariat)</i>
EirGrid	22nd January 2025	Standard	Mod_01_25
Contact Details for Modification Proposal Originator			
Name	Telephone number	Email address	
Elaine Corcoran			
Modification Proposal Title			
Synchronous Condensers SDP_06			
Documents affected <i>(delete as appropriate)</i>	Section(s) Affected	Version number of T&SC or Agreed Procedure used in Drafting	
T&SC Appendices Glossary	B.7.2.2, B.9.6.1, B.9.6.2, D.3.2.1, Appendix I – 4, 12, Table 2, 14, 15, Appendix O - 6, Glossary	V30	
Explanation of Proposed Change <i>(mandatory by originator)</i>			
<p>The integration of synchronous condensers is a crucial step in enabling Ireland’s transition towards achieving 80% renewable electricity (RES-E) and 95% System Non-Synchronous Penetration (SNSP) by 2030. Synchronous condensers play a vital role in ensuring system stability by providing inertia, reactive power control (both generation and absorption) and voltage support at OMW, as well as addressing short circuits.</p> <p>The current market and scheduling framework does not accommodate the unique characteristics of synchronous condensers, leading to inefficiencies in scheduling and dispatch of these units. Initiative 6 of the Scheduling & Dispatch Programme (SDP_06) seeks to address these issues by introducing a structured approach to the registration and data submission of synchronous condensers within the Trading and Settlement Code (TSC) and establishing optimal scheduling and dispatch mechanisms for synchronous condensers to ensure they meet applicable system service requirements.</p> <p>Synchronous condensers are not accounted for in the TSC at present, meaning multiple workarounds are in place to accommodate current operational synchronous condensers. At present, synchronous condensers are modelled as multi-fuel generator units in the Market Management System (MMS), which does not support negative dispatch instruction for such units, nor does it allow units to be considered “ON” at OMW. To work around this limitation, synchronous condensers are issued a 1MW dispatch instruction, which is unreflective of their unique operational characteristics. Additionally, synchronous condensers are capable of submitting non-zero Commercial Offer Data (COD) in the Balancing Market. As synchronous condensers are not settled in the Balancing Market, they should not have the ability to submit COD. These non-zero costs can force scheduling / dispatch outcomes that may not be optimal for the grid.</p> <p>This modification introduces changes to the TSC, which can be summarised as follows:</p> <ul style="list-style-type: none"> • ‘Synchronous Condenser Units’ is defined in the TSC Glossary. The definition of ‘Generator Unit’ and ‘Fuel Type’ have also been updated. • Registration criteria for Synchronous Condenser Units has been defined in TSC Chapter B. 			

- Synchronous Condenser Units shall not submit Physical Notifications (PNs).
- Synchronous Condenser Units shall not submit Commercial Offer Data (COD).
- Synchronous Condenser Units shall submit Technical Offer Date (TOD) that is relevant to Synchronous Condenser Units. The applicable fields will be defined in TSC Appendix I – Offer Data.
- Instruction Profiling will not be performed for Synchronous Condenser Units.
- Dispatch Quantity data will not be calculated for Synchronous Condenser Units.

The application of Mod_13_19 will remain, meaning that units providing DS3 system services at OMW (including synchronous condensers) will not incur charges for their energy consumption while providing these services.

Note: Changes to ensure optimal scheduling and dispatch mechanisms for synchronous condensers will be required as part of SDP_06 but will not form part of the TSC modification.

Implementing this modification will establish a structured framework for synchronous condensers within the TSC and eliminate the workarounds in place for their registration, scheduling and dispatch. SDP_06 will provide a scalable solution that can accommodate more synchronous condensers as they become operational in Ireland and Northern Ireland. By formalising these changes, SDP_06 will provide an improved and more efficient solution for the stable integration of synchronous condensers into Ireland’s evolving energy market.

This modification proposal outlines one of the options that we are presenting to the panel. The TSOs are also exploring alternative options that will handle Synchronous Condensers outside of the market and will present both to the Committee.

Legal Drafting Change

*(Clearly show proposed code change using **tracked** changes, if proposer fails to identify changes, please indicate best estimate of potential changes)*

From the Code:

B.7.2.2 A Party (or Applicant, as applicable) shall, in a Participation Notice in respect of a Generator Unit, specify if the Unit is:

- (a) a Wind Power Unit;
- (b) an Energy Limited Generator Unit;
- (c) a Pumped Storage Unit;
- (d) a Battery Storage Unit;
- (e) a Demand Side Unit;
- (f) an Aggregated Generator Unit;
- (g) a Trading Unit;
- (h) an Assetless Unit;
- (i) a Dual Rated Generator Unit; ~~or~~
- (j) a Solar Power Unit; ~~or~~
- (k) a Synchronous Condenser Unit.

B.9.6 Synchronous Condensers

B.9.6.1 For each Synchronous Condenser, a Party (or Applicant as applicable) shall register as part of a single Trading Site in accordance with this section B.9:

- (a) the Synchronous Condenser Unit or Units;
- (b) a single Supplier Unit which is a Trading Site Supplier Unit; and
- (c) no other Unit.

B.9.6.2 Any Trading Site with a Synchronous Condenser must meet and continue to meet the following criteria:

- (a) the Trading Site shall have the technical and operational capability to deliver agreed DS3 System Services in response to Dispatch Instructions from the relevant System Operator in accordance with the relevant Grid Code; and
- (b) the Demand Site shall have appropriate equipment to permit real-time monitoring of delivery by the relevant System Operator;

D.3.2 Data Submission

D.3.2.1 The provisions of this section D.3.2 do not apply to any Unit which is:

- (a) an Assetless Unit;
- (b) a Trading Unit;
- (c) an Interconnector Error Unit;~~or~~
- (d) an Interconnector Residual Capacity Unit;or
- (e) a Synchronous Condenser Unit.

From Appendices:

Appendix I : Offer Data

Commercial Offer Data for Generator Units

4. Participants shall not submit Commercial Offer Data in respect of each of the following Generator Units:

- (a) Trading Unit;
- (b) Assetless Unit;
- (c) Interconnector Residual Capacity Unit;
- (d) Interconnector Error Unit;~~or~~
- (e) Generator Unit which is not Dispatchable;or
- (f) Synchronous Generator Unit.

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Technical Offer Data for Generator Units

12. A Participant shall only submit Technical Offer Data to the Market Operator in respect of its Generator Units as provided for in Table 2.

Table 2 – Technical Offer Data Elements

	TYPE OF DATA		SUBMISSION REQUIREMENT BY UNIT				
	Validation Technical Offer Data	Validation Registration Data	Battery Storage Unit	Pumped Storage Unit	Demand Side Unit	<u>Synchronous Condenser Unit</u>	Other Generator Units not included in paragraph Error! Reference source not found. of this Appendix
Minimum On Time (hours)	Yes		Yes	Yes		<u>Yes</u>	Yes
Minimum Off Time (hours)	Yes		Yes	Yes		<u>Yes</u>	Yes
Maximum On Time (hours)	Yes		Yes	Yes		<u>Yes</u>	Yes
Synchronous Start Up Time Hot (hours)	Yes		Yes	Yes			Yes

Synchronous Start Up Time Warm (hours)	Yes		Yes	Yes			Yes
Synchronous Start Up Time Cold (hours)	Yes		Yes	Yes			Yes
Block Load Cold (MW)	Yes		Yes	Yes			Yes
Block Load Hot (MW)	Yes		Yes	Yes			Yes
Block Load Warm (MW)	Yes		Yes	Yes			Yes
Deload Break Point (MW)	Yes		Yes	Yes			Yes
Deloading Rate 1 (MW / minute)	Yes		Yes	Yes			Yes
Deloading Rate 2 (MW / minute)	Yes		Yes	Yes			Yes
Dwell Time Up 1 (minutes)	Yes		Yes	Yes			Yes
Dwell Time Up 2 (minutes)	Yes		Yes	Yes			Yes
Dwell Time Up 3 (minutes)	Yes		Yes	Yes			Yes
Dwell Time Down 1 (minutes)	Yes		Yes	Yes			Yes
Dwell Time Down 2 (minutes)	Yes		Yes	Yes			Yes
Dwell Time Down 3 (minutes)	Yes		Yes	Yes			Yes

Dwell Time Up Trigger Point 1 (MW)	Yes		Yes	Yes			Yes
Dwell Time Up Trigger Point 2 (MW)	Yes		Yes	Yes			Yes
Dwell Time Up Trigger Point 3 (MW)	Yes		Yes	Yes			Yes
Dwell Time Down Trigger Point 1 (MW)	Yes		Yes	Yes			Yes
Dwell Time Down Trigger Point 2 (MW)	Yes		Yes	Yes			Yes
Dwell Time Down Trigger Point 3 (MW)	Yes		Yes	Yes			Yes
End Point of Start Up Period (MW)	Yes		Yes	Yes			Yes
Load Up Break Point Cold 1 (MW)	Yes		Yes	Yes			Yes
Load Up Break Point Cold 2 (MW)	Yes		Yes	Yes			Yes
Load Up Break Point Hot 1 (MW)	Yes		Yes	Yes			Yes

Load Up Break Point Hot 2 (MW)	Yes		Yes	Yes			Yes
Load Up Break Point Warm 1 (MW)	Yes		Yes	Yes			Yes
Load Up Break Point Warm 2 (MW)	Yes		Yes	Yes			Yes
Loading Rate Cold 1 (MW / minute)	Yes		Yes	Yes			Yes
Loading Rate Cold 2 (MW / minute)	Yes		Yes	Yes			Yes
Loading Rate Cold 3 (MW / minute)	Yes		Yes	Yes			Yes
Loading Rate Hot 1 (MW / minute)	Yes		Yes	Yes			Yes
Loading Rate Hot 2 (MW / minute)	Yes		Yes	Yes			Yes
Loading Rate Hot 3 (MW / minute)	Yes		Yes	Yes			Yes
Loading Rate Warm 1 (MW / minute)	Yes		Yes	Yes			Yes
Loading Rate Warm 2 (MW / minute)	Yes		Yes	Yes			Yes

Loading Rate Warm 3 (MW / minute)	Yes		Yes	Yes			Yes
Ramp Down Break Point 1 (MW)	Yes		Yes	Yes			Yes
Ramp Down Break Point 2 (MW)	Yes		Yes	Yes			Yes
Ramp Down Break Point 3 (MW)	Yes		Yes	Yes			Yes
Ramp Down Break Point 4 (MW)	Yes		Yes	Yes			Yes
Ramp Down Rate 1 (MW / minute)	Yes		Yes	Yes		Yes	Yes
Ramp Down Rate 2 (MW / minute)	Yes		Yes	Yes			Yes
Ramp Down Rate 3 (MW / minute)	Yes		Yes	Yes			Yes
Ramp Down Rate 4 (MW / minute)	Yes		Yes	Yes			Yes
Ramp Down Rate 5 (MW / minute)	Yes		Yes	Yes			Yes
Ramp Up Break Point 1 (MW)	Yes		Yes	Yes			Yes
Ramp Up Break Point 2 (MW)	Yes		Yes	Yes			Yes
Ramp Up Break Point 3 (MW)	Yes		Yes	Yes			Yes

Ramp Up Break Point 4 (MW)	Yes		Yes	Yes			Yes
Ramp Up Rate 1 (MW / minute)	Yes		Yes	Yes		<u>Yes</u>	Yes
Ramp Up Rate 2 (MW / minute)	Yes		Yes	Yes			Yes
Ramp Up Rate 3 (MW / minute)	Yes		Yes	Yes			Yes
Ramp Up Rate 4 (MW / minute)	Yes		Yes	Yes			Yes
Ramp Up Rate 5 (MW / minute)	Yes		Yes	Yes			Yes
Soak Time Cold 1 (minutes)	Yes		Yes	Yes			Yes
Soak Time Cold 2 (minutes)	Yes		Yes	Yes			Yes
Soak Time Trigger Point Cold 1 (MW)	Yes		Yes	Yes			Yes
Soak Time Trigger Point Cold 2 (MW)	Yes		Yes	Yes			Yes
Soak Time Hot 1 (minutes)	Yes		Yes	Yes			Yes
Soak Time Hot 2 (minutes)	Yes		Yes	Yes			Yes
Soak Time Trigger Point Hot 1 (MW)	Yes		Yes	Yes			Yes

Soak Time Trigger Point Hot 2 (MW)	Yes		Yes	Yes			Yes
Soak Time Warm 1 (minutes)	Yes		Yes	Yes			Yes
Soak Time Warm 2 (minutes)	Yes		Yes	Yes			Yes
Soak Time Trigger Point Warm 1 (MW)	Yes		Yes	Yes			Yes
Soak Time Trigger Point Warm 2 (MW)	Yes		Yes	Yes			Yes
Start of Restricted Range 1 (MW)	Yes		Yes	Yes		<u>Yes</u>	Yes
End of Restricted Range 1 (MW)	Yes		Yes	Yes		<u>Yes</u>	Yes
Start of Restricted Range 2 (MW)	Yes		Yes	Yes			Yes
End of Restricted Range 2 (MW)	Yes		Yes	Yes			Yes
Hot Cooling Boundary (hours)	Yes		Yes	Yes			Yes
Warm Cooling Boundary (hours)	Yes		Yes	Yes			Yes

Block Load Flag (True or False)	Yes		Yes	Yes		<u>Yes</u>	Yes
Short-Term Maximisation Capability (MW)	Yes		Yes	Yes			Yes
Short-Term Maximisation Time (minutes)	Yes		Yes	Yes			Yes
Registered Minimum Stable Generation (MW)	Yes		Yes	Yes		<u>Yes</u>	Yes
Registered Minimum Output (MW)		Yes	Yes	Yes		<u>Yes</u>	Yes
Pumped Storage Cycle Efficiency (percentage)	Yes			Yes			
Battery Storage Efficiency (percentage)	Yes		Yes				
Pumping Capacity (MW)	Yes			Yes			
Off to Generating Time (minutes)	Yes			Yes			
Off to Spin Pump Time (minutes)	Yes			Yes			

Spin Pump to Pumping Energy Time (minutes)	Yes			Yes			
Battery Storage Capacity (MW)	Yes		Yes				
Minimum Battery Storage Quantity (MWh)		Yes	Yes				
Maximum Battery Storage Quantity (MWh)		Yes	Yes				
Maximum Storage Quantity (MWh)		Yes		Yes			
Minimum Storage Quantity (MWh)		Yes		Yes			
Maximum Ramp Down Rate (MW / minute)	Yes				Yes		
Maximum Ramp Up Rate (MW / minute)	Yes				Yes		
Minimum Down Time (hours)	Yes				Yes		
Maximum Down Time (hours)	Yes				Yes		

Physical Notification Data Submission

14. Each Participant may submit Physical Notification Data to the Market Operator in respect of each of its Generator Units and Supplier Units as follows:

- (a) before Gate Closure 1 in respect of the Trading Day, in accordance with paragraphs 16 and 17 of this Appendix;
- (b) before Gate Closure 2 in respect of the Imbalance Settlement Period, in accordance with paragraphs 16 and 17 of this Appendix.

15. Participants shall not submit Physical Notification Data in respect of each of the following Generator Units:

- (a) Trading Unit;
- (b) Assetless Unit;
- (c) Interconnector Residual Capacity Unit;~~or~~
- (d) Interconnector Error Unit or
- (e) Synchronous Condenser Unit.

Appendix O : Instruction Profiling Calculation

6. Instruction Profiling shall not be performed for Generator Units which are not Dispatchable and not Controllable, Assetless Units ~~or~~ Interconnector Residual Capacity Units or Synchronous Condenser Units, and the values of Dispatch Quantity for these Generator Units, where applicable, shall be calculated as set out in section F.2.4.

From Glossary:

Fuel Type	means the fuel or fuels registered in accordance with the Grid Code as the principal fuel(s) authorised for energy production by the Generator Unit except for Synchronous Condenser Unit where the Fuel Type will be set to 'SYNCHRONOUS_CONDENSER' .
Generator Unit	means one or more Generators, other item of Dispatchable plant or a notional unit registered as a Generator Unit under this Code. For the purposes of the Code a Generator Unit may be any one of the following types: (a) physical: Aggregated Generator Unit, Demand Side Unit, Energy Limited Generator Unit, Hydro-electric Generator Unit, Pumped Storage Unit, Battery

	Storage Unit, Trading Unit, Wind Power Unit, Solar Power Unit, or Dual Rated Generator Unit <u>or a Synchronous Condenser Unit</u> ;
	(b) notional: Assetless Unit, which includes a unit registered by a SEM NEMO or a Shipping Agent under section B.8, an Interconnector Error Unit or Interconnector Residual Capacity Unit.
Synchronous Condenser Unit	a <u>Dispatchable apparatus that provides DS3 System Services only, as agreed with the System Operator.</u>

Modification Proposal Justification
(Clearly state the reason for the Modification)

These changes will allow the TSOs to accommodate synchronous condensers by establishing a structured framework within the TSC and eliminate the workarounds currently in place for their registration, scheduling and dispatch. SDP_06 will provide a scalable solution that can accommodate more synchronous condensers as they become operational in Ireland and Northern Ireland. By formalising these changes, SDP_06 will provide an improved and more efficient solution for the stable integration of synchronous condensers into Ireland's evolving energy market.

Code Objectives Furthered
(State the Code Objectives the Proposal furthers, see Section A.2.1.4 of Pa of the T&SC for Code Objectives)

The aim of this Modification is to further the following Code objectives:

- (c) to facilitate the participation of electricity undertakings engaged in the generation, supply or sale of electricity in the trading arrangements under the Single Electricity Market;
- (g) to promote the short-term and long-term interests of consumers of electricity on the island of Ireland with respect to price, quality, reliability, and security of supply of electricity.

Implication of not implementing the Modification Proposal
(State the possible outcomes should the Modification Proposal not be implemented)

The Scheduling & Dispatch Programme aims to enhance scheduling and dispatch processes in Ireland and Northern Ireland and facilitate low carbon grid technologies such as synchronous condensers. Over the coming years, more synchronous condensers will become operational and if this modification is not implemented, the current limitations and workarounds described for synchronous condenser units will remain in place.

Working Group (State if Working Group considered necessary to develop proposal)	Impacts (Indicate the impacts on systems, resources, processes and/or procedures; also indicate impacts on any other Market Code such as Capacity Market Code, Grid Code, Exchange Rules etc.)
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N/A

Impact Assessment on Market System changes to be provided by the vendor.

Please return this form to Secretariat by email to balancingmodifications@sem-o.com

Notes on completing Modification Proposal Form:

1. If a person submits a Modification Proposal on behalf of another person, that person who proposes the material of the change should be identified on the Modification Proposal Form as the Modification Proposal Originator.
2. Any person raising a Modification Proposal shall ensure that their proposal is clear and substantiated with the appropriate detail including the way in which it furthers the Code Objectives to enable it to be fully considered by the Modifications Committee.
3. Each Modification Proposal will include a draft text of the proposed Modification to the Code unless, if raising a Provisional Modification Proposal whereby legal drafting text is not imperative.
4. For the purposes of this Modification Proposal Form, the following terms shall have the following meanings:

Agreed Procedure(s):	means the detailed procedures to be followed by Parties in performing their obligations and functions under the Code as listed in either Part A or Part B Appendix D "List of Agreed Procedures". The Proposer will need to specify whether the Agreed Procedure to modify refers to Part A, Part B or both.
T&SC / Code:	means the Trading and Settlement Code for the Single Electricity Market. The Proposer will also need to specify whether all Part A, Part B, Part C of the Code or a subset of these, are affected by the proposed Modification;
Modification Proposal:	means the proposal to modify the Code as set out in the attached form
Derivative Work:	means any text or work which incorporates or contains all or part of the Modification Proposal or any adaptation, abridgement, expansion or other modification of the Modification Proposal

The terms "Market Operator", "Modifications Committee" and "Regulatory Authorities" shall have the meanings assigned to those terms in the Code.

In consideration for the right to submit, and have the Modification Proposal assessed in accordance with the terms of Section 2 of Part A or Chapter B of Part B of the Code (and Part A Agreed Procedure 12 or Part B Agreed Procedure 12) , which I have read and understand, I agree as follows:

1. I hereby grant a worldwide, perpetual, royalty-free, non-exclusive licence:
 - 1.1 to the Market Operator and the Regulatory Authorities to publish and/or distribute the Modification Proposal for free and unrestricted access;
 - 1.2 to the Regulatory Authorities, the Modifications Committee and each member of the Modifications Committee to amend, adapt, combine, abridge, expand or otherwise modify the Modification Proposal at their sole discretion for the purpose of developing the Modification Proposal in accordance with the Code;
 - 1.3 to the Market Operator and the Regulatory Authorities to incorporate the Modification Proposal into the Code;
 - 1.4 to all Parties to the Code and the Regulatory Authorities to use, reproduce and distribute the Modification Proposal, whether as part of the Code or otherwise, for any purpose arising out of or in connection with the Code.
2. The licences set out in clause 1 shall equally apply to any Derivative Works.
3. I hereby waive in favour of the Parties to the Code and the Regulatory Authorities any and all moral rights I may have arising out of or in connection with the Modification Proposal or any Derivative Works.
4. I hereby warrant that, except where expressly indicated otherwise, I am the owner of the copyright and any other intellectual property and proprietary rights in the Modification Proposal and, where not the owner, I have the requisite permissions to grant the rights set out in this form.
5. I hereby acknowledge that the Modification Proposal may be rejected by the Modifications Committee and/or the Regulatory Authorities and that there is no guarantee that my Modification Proposal will be incorporated into the Code.