

Annual Audit of the Scheduling and Dispatch Process

2020 and 2021 Terms of Reference

25 March 2021



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1. Introduction

In compliance with Paragraph 9 of Condition 10A and Condition 22A of the respective Transmission System Operator Licences, EirGrid plc and SONI Limited ('the Transmission System Operators') are required to undertake a periodic audit of the operation and implementation of the scheduling and dispatch process.

The licence conditions state that -

'The Licensee shall arrange for the carrying out of a periodic audit of the scheduling and dispatch process, its operation and implementation in accordance with directions given to it from time to time ... in respect of such matters as ... (the Commission for Regulation of Utilities and the Utility Regulator (collectively referred to as 'the Regulatory Authorities'))... considers appropriate, including.....

(A) the frequency, audit period, process and timetable for the audit;

(B) the selection, appointment and tenure of a person or firm to carry out the audit;

(C) the terms of reference for the audit;

(D) the publication of the audit report and of any other relevant materials;

This document describes the terms of reference for the audit of the scheduling and dispatch process as it was implemented during the 2020 and 2021 audit periods. Its publication follows a public consultation on the proposed scope.

2. Consultation Report

The Transmission System Operators received five submissions during the consultation period which closed on 12th February 2021. Submissions were received from Bord Gáis Energy, Bord na Móna, ESB Generation and Trading, SSE and Wind Energy Ireland. The Transmission System Operators would like to thank these parties for their representations, all of which are published with this document and which were forwarded to the Regulatory Authorities and the Auditor.

While the consultation sought feedback on the proposed scope for the 2020 and 2021 audit periods the Transmission System Operators received additional representations both in relation to the audit process and the scheduling and dispatch process. We have addressed all representations in the interests of providing clarity.

The following table summarises the representations received on the matter of the scope for the 2020 and 2021 audit periods.

Representations on the Scope	Transmission System Operators' Response
<p>One representation assumed 'that an assessment of any related but relevant requirements has been made' in relation to regulations not explicitly included in the scope.</p>	<p>Only regulations specifically noted in the scoping table are included in scope. As detailed on page 10 of the 2018/2019 report, the following is excluded :</p> <p>"Any regulations which are cross referenced within the regulations listed as the criteria but not specifically identified as criteria themselves, other than those specifically referenced in the table above as documented in paragraph 5 of this document".</p> <p>The scope must be explicit and specific to ensure an open ended audit process is not initiated. Exclusions are included in the terms of reference for clarity.</p>
<p>One representation queried the outputs from the optimisation engines and how these outputs are used in the scheduling and dispatch audit process.</p>	<p>Insofar as they are relevant to the scope of the audit, the inputs into the scheduling and dispatch process and the outputs from the optimisation engines form part of the scope of the audit. The optimisation outputs are utilised in a significant portion of the audit procedures.</p> <p>For the purposes of clarity, the optimisation engine itself is not included within the scope of the audit.</p>
<p>One representation queried why the requirements described in Trading and Settlement Code Part B, APPENDIX N: Flagging and Tagging, System Operator and Non-Marginal Flagging, Paragraphs 4 and 5 were not included in the scope. These relate to the publication of a methodology for determining System Operator and Non-Marginal Flags.</p>	<p>Paragraphs 4 and 5 of the Trading and Settlement Code Part B, APPENDIX N: Flagging and Tagging, System Operator and Non-Marginal Flagging, have been added to the scope of the 2020 and 2021 audit.</p>

<p>Two representations queried the exclusion of the optimisation engines or changes to the optimisation engines from the scope.</p>	<p>The optimisation engines and associated algorithms within the Market Management System are proprietary, third-party systems which the Transmission System Operators cannot provide access to. The exclusion of the optimisation engines and associated algorithms was discussed and agreed with the Regulators before the commencement of the 2018/2019 audit. The exclusion has been retained for the 2020 and 2021 audit periods.</p> <p>There has been no change to the optimisation engines since go-live.</p> <p>Insofar as they are relevant to the scope of the audit, the inputs into the scheduling and dispatch process and the outputs from the optimisation engines form part of the scope of the audit. The optimisation outputs are utilised in a significant portion of the audit procedures.</p> <p>If any changes occurred to the optimisation engines and associated algorithms within the 2020/2021 audit periods, these changes will be included in the scope of the engagement under Pillar 6, Information Technology General Controls where the audit team will complete testing over the change management process undertaken to the optimisation engines' associated algorithms. This would consist of testing IT general controls supporting the change. It would not include the performance of any independent code review.</p>
<p>One representation sought confirmation on the meaning of two proposed exclusions: actions taken to resolve performance issues and engineering decisions.</p>	<p>The performance issues referenced are unit issues such as not responding to set points or other Grid Code requirements.</p> <p>Engineering decisions referenced are decisions made by those operating the scheduling and dispatch process in real time.</p>

One representation considered it was appropriate that the publication of data be included in an audit.	An audit over the completeness and accuracy of data publications to external websites is not a specific regulatory requirement included in the scope of the scheduling and dispatch process audit. Data reporting including website reporting is however in scope for the Trading and Settlement Code audit.
One representation requested that the scope would include a quantitative analysis both across a set of constraint groups for constraint application and a set of geographically diverse windfarms for curtailment application to confirm an even distribution of curtailment and constraint.	<p>Providing analysis over constraint and curtailment events will not be an appropriate test procedure to ensure that the Transmission System Operators complied with their specific regulatory requirement included in the scope of the scheduling and dispatch process audit.</p> <p>Please refer to test procedure 18 Curtailment Events and 19 Constraint Events (Pillar 1: Priority Dispatch and Cross Zonal Actions) on page 12 of the published Independent Assurance Report on compliance with specified elements of the Scheduling and Dispatch process for the 15 month period ended 31 December 2019 which outlines the test procedures that will be completed in relation to Curtailment and Constraint events.</p> <p>The populations used to complete samples selections will be considered separately for both test procedures. When samples are selected, the auditor will consider different constraint groups and geographically diverse windfarms.</p>
One representation requested the inclusion of the Imbalance Pricing process on the understanding that it influences dispatch.	It is not possible to accurately predict in real time the impact of a dispatch decision on the Imbalance Price due to the Imbalance Price processing. Imbalance Pricing is in scope for the Trading and Settlement Code audit.
One representation requested clarity on the inclusion of Condition 10A - Paragraph 3 of the EirGrid TSO licence and Condition 22A - Paragraph 3 of the SONI TSO licence (operation of merit orders).	The entire Paragraph 3 is in scope.

<p>One representation requested that 'Engineering Decisions' are not excluded from the scope.</p>	<p>Engineering decisions referenced are decisions made by those operating the scheduling and dispatch process in real time.</p> <p>To aid clarity, it is not possible to subsequently perform test procedures over a real time decision made by an engineer based on the status of the network at that time. It is also not the role of the auditor to challenge whether alternative technically feasible decisions could have been made with the data available to the control room at that point in time. However, in performing a number of procedures the auditor does seek explanations for why certain engineering decisions might have been made and then requests supporting evidence to substantiate the logic provided as the basis of the decision.</p> <p>Examples where explanations are sought for selected samples:</p> <p>Pillar 1: Priority Dispatch and Cross Zonal Actions - Test procedure 18(a) Curtailment Events and 19(a) Constraint Events</p> <p>Explanations and supporting evidence will be sought for any curtailment or constraint event applied to a sample day to support the engineering decision made at that point in time.</p> <p>Pillar 3: Merit Order – Test procedure 30(a)</p> <p>If it was noted by the Auditor that if the TSOs selected one generator above another in the merit order with a more expensive cost, supporting evidence and explanations as appropriate will be requested from the TSOs to support the engineering decision made at that point in time.</p> <p>If a reasonable explanation and supporting documentation cannot be provided to the Auditor to substantiate an engineering decision, the lack of</p>

	<p>evidence will be considered as possible noncompliance.</p> <p>Excluding engineering decisions is in line with industry practice e.g. National Grid UK balancing services review.</p>
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The following table summarises the representations received on other matters for the 2020 and 2021 audit periods.

Representations on the Auditor, Audit Procedures, Materiality and Clarifications	Transmission System Operators' Response
<p>One representation requested clarity on the treatment of System Operator to System Operator (interconnector) trades in the merit orders.</p>	<p>The merit orders do not include interconnector trades. The merit orders advise dispatch actions. The interconnectors are not dispatched but ramp according to a reference programme per market or trade outcomes.</p> <p>Elements of Interconnector schedules and trades are tested in test procedure 18 Curtailment Events (Pillar 1: Priority Dispatch and Cross Zonal Actions) to confirm if Interconnector trading was considered before a curtailment event occurred and in test procedure 28 Interconnector Reference Programs (Pillar 2: Dispatch Instructions (+Schedules)) where Interconnector Reference Programs are checked against the LTS schedules and their operating limits.</p>
<p>One representation requested a change to the scheduling and dispatch process, proposing an 'actions for energy first' principle.</p>	<p>Changes to the scheduling and dispatch process are outside the scope of the audit.</p>
<p>Two representations included commentary on the requirements of the Auditor.</p>	<p>The Auditor was appointed following an OJEU public procurement process which sought the services of a suitable, independent, organisation to undertake an audit to specific, appropriate international standards.</p> <p>The Transmission System Operators are satisfied that the provider has the necessary capability and skills to perform this work under the International</p>

	<p>Standard on Assurance Engagements 3000 (Revised), 'Assurance engagements other than audits or reviews of historical financial information' issued by the International Auditing and Assurance Standards Board (hereinafter referred to as ISAE 3000).</p> <p>The chosen PwC team includes both auditors and subject matter experts with appropriate energy utility experience.</p>
<p>Two representations requested that a published, defined materiality threshold is applied to the scheduling and dispatch audit with one citing the Trading and Settlement Code audit as an example.</p>	<p>The Trading and Settlement Code includes formulaic tests which accommodate a quantitative materiality test i.e. financial impact of outcome X versus outcome Y. The scheduling and dispatch process is more appropriately subjected to a blend of quantitative and qualitative materiality tests. Further, it may not be possible to accurately quantify the impact of an action or decision due to degree of post-processing that takes place for pricing and settlement.</p> <p>The Transmission System Operators have passed on all representations to the Auditor for their consideration.</p>
<p>Two representations requested that materiality is considered both on an individual unit basis and on the basis of the scheduling and dispatch process as a whole.</p>	<p>The assurance engagement is planned and performed so as to be able to provide reasonable assurance under ISAE 3000 that the Transmission System Operators have operated the specified elements of the scheduling and dispatch process in all material respects in accordance with the requirements.</p> <p>Misstatements, including omissions, are considered to be material if they, individually or in the aggregate, could reasonably be expected to influence relevant decisions of intended users, in this case the Directors of EirGrid and SONI Limited, taken on the basis of the subject matter information. The possible effect of misstatements on specific users, whose information needs may vary widely, is not ordinarily</p>

	<p>considered.</p> <p>When assessing a potential failure on the Transmission System Operators' part to comply with the requirements, quantitative and qualitative factors will be considered. One of the factors will be considering the potential non-compliance against a quantitative materiality, if applicable. However, given the nature of the audit is a compliance audit performing a qualitative evaluation will in most cases be more appropriate.</p> <p>This is in line with ISAE 3000.</p>
<p>One respondent recommended testing if actions to minimise curtailment including minimising conventional generation output and interconnector trading were implemented.</p>	<p>Per the independent assurance report for 2018/19, these tests are included in the audit procedures.</p> <p>Please refer to test procedure 18 Curtailment Events and 19 Constraint Events (Pillar 1: Priority Dispatch and Cross Zonal Actions) on page 12 of the published Independent Assurance Report on compliance with specified elements of the Scheduling and Dispatch process for the 15 month period ended 31 December 2019.</p>
<p>Two representations discussed the wind dispatch methodology including the appropriateness of the distribution and application of dispatch volumes.</p>	<p>It is not the purpose of an audit to develop methodologies such as those which seek to implement policy decisions and Regulations but to test against methodologies which are in place.</p>
<p>One representation requested the publication of additional information on the analysis and data used in the audit.</p>	<p>The published Independent Assurance Report on compliance with specified elements of the Scheduling and Dispatch process for the 15 month period ended 31 December 2019 complies with paragraph 69 of ISAE 3000 setting out minimum Assurance Report requirements.</p> <p>The Approach Document which accompanied the 2018/19 Independent Assurance Report provided a significant amount of detail which is not typical for</p>

	<p>similar audits. The Transmission System Operators have passed on all representations to the Auditor for their consideration.</p>
<p>One representation recommended that data for the full audit period is used for the audit rather than a sample.</p>	<p>The audit of the scheduling and dispatch process is a Reasonable Assurance Engagement performed in accordance with the requirements of International Standard on Assurance Engagements 3000 (Revised), 'Assurance engagements other than audits or reviews of historical financial information' issued by the International Auditing and Assurance Standards Board.</p> <p>The audit procedures are designed to comply with the standard including in relation to data populations and sample selections. It should further be noted that it will not be feasible to test each piece of information for a 12 month period, further also considering that LTS schedules are run typically six times a day and RTC and RTD schedules every 15 minutes and every 5 minutes respectively on every day.</p> <p>The auditor will therefore select samples based on their assessment of population and risk. Please refer to the next point for a description of how sample days are selected.</p> <p>The Transmission System Operators have passed on all representations to the Auditor for their consideration.</p>
<p>One representation requested an opportunity to propose specific periods for inclusion in the audit process.</p>	<p>The auditor selects days/periods of interest independently. The auditor will select a sample of Settlement Days for testing. The days reviewed will be based on the Auditor's assessment of risk. It will represent a mixture of "normal" days and other days where they identify unusual factors (e.g. outages, System Alerts, generator trips, weekends, high wind days or days around a specific system / market event) which, in their view, represent a risk as to compliance with internal operating procedures.</p>

	<p>The Transmission System Operators will pass on any specific periods identified by participants as being of interest for the Auditor’s consideration for the 2021 audit. The Transmission System Operators will seek this input at the appropriate participant forum.</p>
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3. Scope of the 2020 and 2021 Audits

The audit of the scheduling and dispatch process is separate to the SEM market audit and the SEM capacity market audit. The obligations for those audits are set out in the Trading and Settlement Code and the Capacity Market Code. The Transmission System Operators intend that the scope of those audits remains separate to the audit of the scheduling and dispatch process.

The scope of the scheduling and dispatch process audit will consist of an assessment in respect of our compliance with regulatory requirements (collectively called ‘the requirements’) as they relate to specified elements of the scheduling and dispatch process during the audit period i.e. calendar year.

It is the responsibility of the Auditor, to assess on a sample basis, the compliance of the Transmission System Operators with the requirements in respect of the specified elements of the scheduling and dispatch process as noted below.

Following on from the consultation and representations received, the requirements outlined below, as they relate to specified elements of the scheduling and dispatch process, will be considered within the scope for the 2020 Audit and subsequent 2021 Audit.

#	In Scope Items	Criteria EirGrid ¹	Criteria SONI ¹
1	Priority Dispatch and Cross Zonal Actions	<p>EirGrid Transmission System Operator Licence (“EirGrid TSO Licence”) Condition 10A – Para. 4(a)/(b) & 5(f), (i)</p> <p>Other requirements: SEM-11-062</p>	<p>SONI Transmission System Operator Licence (“SONI TSO Licence”) Condition 22A – Para. 4(a)/(b) & 5(f), (i) Condition 9A</p> <p>Other requirements: SEM-11-062</p>
2	Dispatch Instructions	<p>EirGrid TSO Licence Condition 10A – Para. 2, 4 and 5</p> <p>Other requirements:</p> <p>For 2020 Audit Period: SEM-19-065 Trading and Settlement Code Scheduling and Dispatch Parameters 2020 Decision Paper</p> <p>For 2021 Audit Period: SEM-20-075 Trading and Settlement Code Scheduling and Dispatch Parameters 2021 Decision Paper</p> <p>EirGrid Grid Code CC. 8.2.1</p>	<p>SONI TSO Licence Condition 22A – Para. 2, 4 and 5</p> <p>Other requirements:</p> <p>For 2020 Audit Period: SEM-19-065 Trading and Settlement Code Scheduling and Dispatch Parameters 2020 Decision Paper</p> <p>For 2021 Audit Period: SEM-20-075 Trading and Settlement Code Scheduling and Dispatch Parameters 2021 Decision Paper</p> <p>SONI Grid Code CC. 5.3.1</p>
3	Merit Orders	<p>EirGrid TSO Licence Condition 10A – Para. 3</p> <p>Other requirements:</p> <p>EirGrid Grid Code SDC 1.4.7.3 / SDC1.4.7.4 and SDC2.4.2.14</p>	<p>SONI TSO Licence Condition 22A – Para. 3</p> <p>Other requirements:</p> <p>SONI Grid Code SDC 1.4.8.3 / SDC1.4.8.4 and SDC2.4.2.14</p>
4	Operational Constraints	<p>EirGrid TSO Licence Condition 10A – Para. 4(a)(b) & 5(d)</p>	<p>SONI TSO Licence Condition 22A – Para. 4(a)(b) & 5(d)</p>
5	Constraint Flagging	<p>Trading and Settlement Code – Part B Flagging of Accepted Bids and Offers E.3.3.1</p> <p>Trading and Settlement Code Part B Appendices, APPENDIX N: Flagging and Tagging, System Operator and Non-Marginal Flagging Paragraph 1-5</p>	<p>Trading and Settlement Code – Part B Flagging of Accepted Bids and Offers E.3.3.1</p> <p>Trading and Settlement Code Part B Appendices, APPENDIX N: Flagging and Tagging, System Operator and Non-Marginal Flagging Paragraph 1-5</p>

¹ Links to current versions of licences and codes provided for clarity. All versions of cited licences and codes which are in effect during an audit period will be in scope.

6	IT General Controls required to support the areas noted in items 1-5 above	While not specifically discussed in the regulations, maintaining IT General Controls over key systems supporting items 1-5 above is key to the overall testing approach.
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In the interests of clarity, the following is specifically excluded from the Assurance Engagements:

- The algorithms associated with the optimisation engines, which produce the Long-Term Scheduling (“LTS”), Real Time Commitment (“RTC”) and Real-Time Dispatch (“RTD”) schedules, used in the scheduling and dispatch process;
- The Imbalance Pricing process which takes place after the scheduling and dispatch process has ended;
- Validation of data submitted to the Transmission System Operators by participants;
- Inputs such as forecasts which are provided by third parties;
- Inputs such as transmission and generator outage plans;
- The derivation of operational constraints;
- Actions taken with market participants by the Transmission System Operators to resolve performance issues during the scheduling and dispatch process;
- Resolution and validation of known system issues and defects which were not resolved in advance of the Revised Market Arrangements go-live²;
- An assessment of the compliance of the Transmission System Operators in relation to any regulations other than those specifically referenced in the table above;
- An assessment of the compliance of the Transmission System Operators in relation to the Regulation on Wholesale Energy Markets Integrity and Transparency (REMIT) pending the implementation of a full solution, at which time it will be considered for inclusion;

²Any known system issues and defects which are a factor in the completion of the testing procedures performed over the specified elements of the scheduling and dispatch process will be acknowledged and listed in the Assurance Report, where necessary.

- Any regulations which are cross referenced within the regulations listed as the criteria but not specifically identified as criteria themselves, other than those specifically referenced in the table above;
- Validation that data published in relation to the specified elements of the scheduling and dispatch process on the EirGrid (www.eirgridgroup.com), SONI (www.soni.ltd.uk), and SEMO (www.sem-o.com) websites is complete and accurate unless specifically included in testing procedures, for example, Operational Constraint Updates
- An assessment of the engineering decisions that The Transmission System Operators make when actioning internal operating procedures relevant to the specified elements of the scheduling and dispatch process; and
- Validation that system security has been maintained at all times.

4. Reporting Requirements

The outcome of the 2020 audit and the 2021 audit, which will be undertaken by an independent external Auditor, will be an Assurance Report for each audit period which opines over the Transmission System Operators' compliance with specific regulatory requirements as they relate to specified elements of the scheduling and dispatch process for the audit periods.

The engagement will be a Reasonable Assurance engagement in line with the International Standard on Assurance Engagements 3000 (Revised), - 'Assurance engagements other than audits or reviews of historical financial information' issued by the International Auditing and Assurance Standards Board.

The Assurance Report will consist of an Opinion which refers to an Approach Document which may include detailed information on the terms of the engagement, the applicable criteria that were used, findings identified in relation to particular aspects of the engagement, details of qualifications identified, details of the experience of the practitioner and the individuals involved in the engagement, disclosure of materiality levels, and any recommendations of note.

Findings identified, if applicable, will be any material weaknesses in the Transmission System Operators' systems or other business matters which come to the Auditor's notice during the course of their work and which they consider should be brought to the attention of the interested parties of the report.

The intention is that the audit Assurance Report and Approach document will be issued to the Regulatory Authorities within six months of the end of each audit period. The Auditors reports will subsequently be published by the Transmission System Operators.

Working arrangements which are currently in place and are subject to ongoing review and change in the context of the evolving COVID-19 pandemic may impact on intended timelines.

The Transmission System Operators will inform the Regulatory Authorities in a timely manner should any delay to reporting be expected.