

# **Consultation on DS3 System Services Qualification Trial Process**

DS3 System Services Implementation Project

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21 June 2016



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## **Executive Summary**

The purpose of this paper is to provide an overview of the proposed framework of the DS3 System Services Qualification Trial Process, and to offer an opportunity for stakeholders to provide feedback on the proposals.

The Qualification Trial Process set out in this paper is predominantly focused on the first year of the new System Services arrangements. As the System Services arrangements mature and more technology classes become qualified to provide System Services, the need for annual trials will be reviewed. In future years, a smaller-scale, bespoke process may be possible.

The Interim Arrangements for DS3 System Services will be in place from 1 October 2016. The Interim Arrangements will be superseded by the implementation of the Enduring Arrangements, currently envisaged as Enduring Tariff based procurement in 2017, and competitive procurement beginning in 2018. The first year of the Interim Arrangements consists of a Central Procurement Process for 11 of the 14 System Services where “Proven” and “Measurable” service providers can tender for the large-scale provision of System Services. The three remaining System Services, which are not covered by the Interim Arrangements, will form a part of the initial Qualification Trial Process. Through the procurement process for the Interim Arrangements, it may emerge that some technologies and Service Providers may not qualify for the Central Procurement Process.

The initial Qualification Trials will be operational from Q1 2017, following the commencement of the Interim Arrangements in Q4 2016. These initial Qualification Trials will provide a mechanism for both existing and new Service Providers to prove the technical capability (from a service provision and performance monitoring perspective) of technologies or technology classes for a subset of System Services. It is anticipated that the Qualification Trial Process will ultimately facilitate participation of an enhanced suite of technologies and portfolio of Services Providers in the provision of System Services, while ensuring the integrity and security of the power systems of Ireland and Northern Ireland are maintained.

We propose to focus on two distinct aspects in the initial Qualification Trial Process. Firstly, “*Provenability*” trials will afford unproven technologies (unproven from a service provision perspective) an opportunity to demonstrate their capabilities to provide a subset of services. This allows the TSOs to prudently consider large-scale reliance on these technologies in the future.

Secondly, “*Measurability*” trials will be used to establish the necessary measurement approaches so that reliable performance metrics can be established for the provision of services from new or existing Service Providers. This is a necessary and essential step, whether in the Interim Arrangements or the Enduring Arrangements for System Services, to allow for the development of robust, efficient and effective performance payment mechanisms.

EirGrid and SONI welcome feedback on the approach proposed and specific questions posed in this consultation.

## Contents

|  |    |
|--|----|
| Executive Summary .....  | 3  |
| 1. Introduction .....  | 6  |
| 1.1. Purpose of Document .....   | 6  |
| 1.2. Proposed Consultation Process .....                                   | 7  |
| 2. Consultation on the Proposed Qualification Trial Process .....          | 8  |
| 2.1. Purpose of the Qualification Trial Process .....                      | 8  |
| 2.2. Proposed Qualification Trial Process Format .....                     | 8  |
| 2.2.1. System Services to be Trialled .....                                | 8  |
| 2.2.2. Provenability Trials .....  | 9  |
| 2.2.3. Measurability Trials .....  | 10 |
| 2.3. Proposed Volumes of Services in the Qualification Trial Process ..... | 10 |
| 2.4. Proposed Trial Criteria .....   | 12 |
| 2.4.1. Provenability Trial Criteria .....                                  | 12 |
| 2.4.2. Measurability Trial Criteria .....                                  | 13 |
| 2.5. Summary .....   | 14 |
| 3. Summary of Consultation Questions .....                                 | 16 |
| 4. Consultation Responses .....  | 17 |

## **1. Introduction**

### **1.1. Purpose of Document**

The objective of the DS3 Programme, of which System Services is a part, is to meet the challenges of operating the electricity system in a safe, secure and efficient manner while facilitating higher levels of renewable energy.

One of the key workstreams in the DS3 Programme is the System Services workstream, which will transform Ancillary Services to be complementary to public policy objectives. The aim of the System Services workstream is to put in place the appropriate structure, level and type of services to ensure that the system can operate securely with higher levels of non-synchronous renewable generation (up to 75% instantaneous penetration). Operating this way will reduce the level of curtailment for wind farms and will deliver significant savings to consumers in meeting the government energy policy objectives to 2020.

As part of the DS3 System Services approach, there is a need to procure essential System Services from Service Providers, whilst allowing for and facilitating a range of new technology classes to provide these services in the future. We do not want to prejudge which technologies will be successful in the Central Procurement Process. There will be existing Service Providers that will be successful in the Central Procurement Process; however, we are open to new Service Providers and technologies that can demonstrate capability.

Facilitating new technologies to provide System Services on the system will increase competitive pressures on the long-term costs of System Service provision to the consumer by expanding the range of Service Providers. This will enable safe, secure and resilient power system operation across future energy scenarios, including higher levels of non-synchronous renewable generation. We support this facilitation of new technologies for non-energy service provision. However, the large-scale deployment of unproven new technology on a power system could undermine the resilience of the power system. In addition, we are conscious of the potential economic exposure of contracting with technologies over the full range of System Services where robust and efficient measurement approaches to monitor performance do not exist or are not fully proven.

The Qualification Trial Process is the means by which we are proposing to balance the desire to facilitate new technologies in DS3 System Services provision, the duty to manage the security of the system prudently, and to only contract for what can be robustly measured. The Qualification Trial Process is the mechanism by which new unproven technology providers of System Services can ultimately gain access to the next available Central Procurement Process.

## **1.2. Proposed Consultation Process**

An overview of the Qualification Trial Process, trial format, trial criteria and competition format are outlined in the next section, with a number of consultation questions interspersed throughout and repeated in summary form at the end of the paper.

## 2. Consultation on the Proposed Qualification Trial Process

This section describes the proposed Qualification Trial Process in detail with consultation questions included that cover each aspect of the process.

### 2.1. Purpose of the Qualification Trial Process

The Qualification Trial Process is required to gain an understanding of the capability of both new and existing Service Providers to provide a range of new and existing System Services. In this initial Qualification Trial Process, we are seeking two key elements: proof of reliable delivery of service – called ‘provenability’ in this document - and proof of the mechanism to monitor the delivery of that service – called ‘measurability’ in this document.

For Service Providers, the purpose of the initial Qualification Trial Process is to enable new technology classes to qualify for the Central Procurement Process for System Services.

In addition, we as TSOs will use the Qualification Trial Process to input to the development of new codes and standards for new technologies, processes and procedures for commissioning and testing of new technologies, and the design of enduring System Services performance monitoring arrangements.

**Question 1: Do you agree that the Qualification Trial Process should focus on both “Provenability” and “Measurability”?**

### 2.2. Proposed Qualification Trial Process Format

#### 2.2.1. System Services to be Trialled

For the initial Qualification Trial Process, we propose to have six trials to cover a range of System Services from a range of new and existing Service Providers. The trials will commence in Q1 2017.

The 14 System Services can be categorised into five different categories:

- 1) **Reserve** – additional MW output or reduction in demand delivered between 5 seconds and 5 minutes after a frequency event that replaces the generation lost immediately after a system event. This includes POR, SOR and TOR1.

- 2) **Ramping** – additional MW output or reduction in demand delivered over longer timescales to replace generation lost during an event, or to respond to an event, or to manage variability and uncertainty on the system. This includes RM1, RM3, RM8, TOR2, RRS and RRD.
- 3) **Inertia** – inherent characteristic of synchronous electrical machines. The associated system service is called SIR.
- 4) **Fast-acting** – services to respond in the sub-5 second time period to aid recovery of the system during system events. This includes FFR, FPFAPR and DRR.
- 5) **Reactive Power** - steady state reactive power control is important for the control of system voltages and for the efficient transmission of power around the system. The associated system service is called SSRP.

Of the 14 System Services, SIR and SSRP are based on the inherent capability of the technology that is providing the service and it is not intended to have any Qualification Trial Process for these. The initial Qualification Trial Process will focus on two elements – Provenability Trials and Measurability Trials – which cover the remaining 12 services.

### 2.2.2. Provenability Trials

For the Provenability Trials, it is proposed to have three separate trials, each trialling two distinct System Services from two of the five categories of System Services. The three trials will target Providing Units<sup>1</sup> in three technology classes: Wind, Demand Side and 'other technologies'. One System Service each from the Ramping and Reserve categories will be trialled as being “representative” of the capability across all the System Services in those two categories. Each of the three Provenability Trials will comprise of POR, as representative of the Reserve category and/ or RM3, as representative of the Ramping category.

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<sup>1</sup> A Providing Unit is defined as the Generating Unit, Aggregator, Demand Side Unit, Wind Farm Power Station, Power Park Module etc. providing the service, and Service Provider means the company that owns or operates the Unit.

**Question 2: Do you agree that the Provenability Trials should focus on proving only two System Services, as representative of all System Services in those categories of System Services?**

**Question 3: Do you agree that the Provenability Trials should focus on the Reserve and Ramping categories of System Services?**

The three Provenability Trials will target Providing Units in three technology classes: Wind, Demand Side and 'other technologies'. Due to the high levels of wind and demand side integration in Ireland and Northern Ireland power systems, we believe it to be appropriate to explore the provision of System Services from these technologies. Wind and demand side are currently the two largest non-conventional energy providers and have the greatest potential in the short term to provide a range of System Services at scale. The 'other technology' category is intended to cover a range of emerging technologies which may have the capability to provide some System Services. This includes technologies such as energy storage schemes and flywheels amongst others.

**Question 4: Do you agree that the technology classes targeted in the Provenability Trials should be wind, demand side and 'other technologies'?**

### **2.2.3. Measurability Trials**

There will also be three Measurability Trials, which will target the measurability of the services in the Fast-Acting category of System Services. The trials will focus on the measurability of FFR, FPRAPR and DRR. The trials will be open to all Service Providers and will be technology neutral.

**Question 5: Do you agree that the Measurability Trials should be technology neutral?**

### **2.3. Proposed Volumes of Services in the Qualification Trial Process**

We propose that the total volume of POR and RM3 procured from the Providing Units in each Provenability Trial will be as set out in Table 1. We propose that

there will be separate selection processes for Providing Units to provide POR and RM3. Depending on the outcomes of the selection processes, a Providing Unit will be eligible to provide both POR and RM3 or only one of these services in each trial.

| Provenability Trials  | Total Volume in Ireland      | Total Volume in Northern Ireland |
|---|------------------------------|----------------------------------|
| Trial 1 – Provenability of Provision of POR and RM3 from Wind                 | 40MW<br>(20MW POR, 20MW RM3) | 40MW<br>(20MW POR, 20MW RM3)     |
| Trial 2 – Provenability of Provision of POR and RM3 from Demand Side          | 20MW<br>(10MW POR, 10MW RM3) | 20MW<br>(10MW POR, 10MW RM3)     |
| Trial 3 – Provenability of Provision of POR and RM3 from ‘other technologies’ | 20MW<br>(10MW POR, 10MW RM3) | 20MW<br>(10MW POR, 10MW RM3)     |
| <b>Total</b>  | <b>80MW</b>                  | <b>80MW</b>                      |

**Table 1:** Proposed volumes of services to be procured in the trials

It is proposed that there will be one Service Provider per service, per jurisdiction in each Measurability Trial as set out in Table 2. A Providing Unit will be eligible to participate in all three trials if successful in the respective Qualification Trial Processes.

| Measurability Trials              | Ireland                    | Northern Ireland           |
|-----------------------------------|----------------------------|----------------------------|
| Trial 4 – Measurability of FFR    | 1 Service Provider         | 1 Service Provider         |
| Trial 5 – Measurability of FPFAPR | 1 Service Provider         | 1 Service Provider         |
| Trial 6 – Measurability of DRR    | 1 Service Provider         | 1 Service Provider         |
| <b>Total</b>                      | <b>3 Service Providers</b> | <b>3 Service Providers</b> |

**Table 2:** Proposed approach to Measurability Trials

**Question 6: Do you agree with the proposed service provision volumes and proposed number of Service Providers to be included in the Provenability and Measurability Trials respectively?**

#### **2.4. Proposed Trial Criteria**

All trials will be open to Service Providers in Ireland and Northern Ireland and open to all parties, irrespective of connection at transmission or distribution level. If connected at distribution system / distribution network level, agreement with the relevant DSO / DNO on the appropriate operating protocols will be required.

##### **2.4.1. Provenability Trial Criteria**

We propose that the minimum service provision size to participate will be 1MW per Providing Unit, in line with the Interim Arrangements, for the trials for wind and demand side.

In response to feedback from industry stakeholders at the DS3 System Services workshops, the lower minimum service provision level of 100kW is being proposed for the 'other technologies' trial. We believe this gives a wide range of potential Service Providers the opportunity to participate in a Qualification Trial Process – whether in the technology-specific trials for wind and demand side or the open 'other technologies' trial.

The maximum service provision size for participation by a Providing Unit in any trial is proposed to be 5MW. This is to ensure that at least two Service Providers per trial can participate, up to the maximum volume to be trialled for that technology class.

The objective of the Provenability Trials will be to perform in 5 events during the trial period, commencing Q1 2017, which will last up to 6 months. The objective is to observe the capability of the Service Provider operating under real system conditions. Since 2011, there have been 8-10 events per year – though these are not usually spaced out evenly on a month-by-month basis. The target of the Service Provider performing in 5 events over a 6 month period is deemed to be prudent from a system security and power system operation perspective.

Each participant in the Qualification Trial Process for the Provenability Trials will be required to provide the following information:

- Proposal on how POR and/or RM3 will be provided and the proposed volume;
- Proposal on how the System Service(s) can be monitored;
- Proposed price the Service Provider expects to be paid per MWh of service provided (capped at the tariffs for the interim arrangements). No performance scalar will be applied for the duration of the trial.

A detailed scope of work and project plan for delivering the service(s) will be required as part of a submission to participate in the Qualification Trial Process. This will include, but not be limited to, a schedule of works, an outline of the relevant expertise within the delivery team, a proposal for interacting with the TSOs on the development and delivery of the service(s) and all relevant health and safety, commercial and legal requirements.

**Question 7: Do you agree with the minimum sizes of Providing Unit proposed for the Provenability trials?**

**Question 8: Do you agree with the proposed evaluation criteria for the selection of participants to take part in the Provenability Trials?**

#### **2.4.2. Measurability Trial Criteria**

We propose that there will no minimum or maximum service provision size applied for participation in this trial. The objective of the trial will be to demonstrate the measurability of each of the three services in the Fast-Acting category of System Services. We propose that the trial period, commencing Q1 2017, will last 3 months. The objective is to provide evidence of performance in one event during the trial period of up to 3 months from two existing or new Service Providers for each System Service, one in each jurisdiction, resulting in participation by up to six different Service Providers in the Measurability Trials.

Each participant in the Qualification Trial Process for the Measurability Trials will be required to provide the following information:

- Proposal on how FFR, FPRAPR and/or DRR can be measured<sup>2</sup>;
- Proposal on how the provision of the service can be independently verified;
- Proposed commercial terms - the TSO propose a single one-off payment, capped at €25,000 per service. Payment will be subject to successful delivery of the trial.

A detailed scope of work and plan for delivering the service(s) will be required as part of a submission to participate in the Qualification Trial Process. This will include, but not be limited to, a schedule of works, an outline of the relevant expertise within the delivery team, a proposal for interacting with the TSO on the development and delivery of the service(s) and all relevant health and safety, commercial and legal requirements.

**Question 9: Do you agree with the proposed evaluation criteria for the selection of participants to take part in the Measurability Trials?**

**Question 10: Given the stated aims of the Qualification Trial Process, are there different criteria that would better achieve those outcomes than what is proposed here? If so, what are they and how will they work?**

## 2.5. Summary

The overall objectives of the Qualification Trial Process are to enable unproven technologies to prove their System Service capabilities and to facilitate participation in the next Central Procurement Process. It also assists us in the development of new codes and standards for new technology classes, new processes and procedures for the commissioning and testing of new technologies, and the design of enduring System Services performance monitoring arrangements.

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<sup>2</sup> All capital costs relating to measurement equipment incurred by participants in the Qualification Trials will be borne by the participants.

Success in the trials will qualify that new technology class for all System Services in that category, as summarised in Table 3.

| Technology         | Trial                           | Outcome   |
|--------------------|---------------------------------|---|
| Wind               | Provenability of POR and/or RM3 | Technology class qualified for Reserve Category (3 services) and/or for Ramping Category (6 services) |
| Demand Side        | Provenability of POR and/or RM3 | Technology class qualified for Reserve Category (3 services) and/or for Ramping Category (6 services) |
| Other Technologies | Provenability of POR and/or RM3 | Technology class qualified for Reserve Category (3 services) and/or for Ramping Category (6 services) |
| All                | Measurability of FFR            | Measurability approach established and technology class qualified for provision of FFR                |
| All                | Measurability of FPFAPR         | Measurability approach established and technology class qualified for provision of FPFAPR             |
| All                | Measurability of FPFAPR         | Measurability approach established and technology class qualified for provision of FPFAPR             |

**Table 3:** Summary of proposed trials and associated outcomes

### **3. Summary of Consultation Questions**

**Question 1: Do you agree that the Qualification Trial Process should focus on both “Provenability” and “Measurability”?**

**Question 2: Do you agree that the Provenability Trials should focus on proving only two System Services, as representative of all System Services in those categories of System Services?**

**Question 3: Do you agree that the Provenability Trials should focus on the Reserve and Ramping categories of System Services?**

**Question 4: Do you agree that the technology classes targeted in the Provenability Trials should be wind, demand side and ‘other technologies’?**

**Question 5: Do you agree that the Measurability Trials should be technology neutral?**

**Question 6: Do you agree with the proposed service provision volumes and proposed number of Service Providers to be included in the Provenability and Measurability Trials respectively?**

**Question 7: Do you agree with the minimum sizes of Providing Unit proposed for the Provenability trials?**

**Question 8: Do you agree with the proposed evaluation criteria for the selection of participants to take part in the Provenability Trials?**

**Question 9: Do you agree with the proposed evaluation criteria for the selection of participants to take part in the Measurability Trials?**

**Question 10: Given the stated aims of the Qualification Trial Process, are there different criteria that would better achieve those outcomes than what is proposed here? If so, what are they and how will they work?**

#### **4. Consultation Responses**

SONI and EirGrid welcome feedback on the questions posed within this paper, which will be used to inform the development of the Qualification Trial Process and/or additional comments.

Responses should be submitted to [DS3@soni.ltd.uk](mailto:DS3@soni.ltd.uk) or [DS3@EirGrid.com](mailto:DS3@EirGrid.com) using the associated questionnaire template by Tuesday 19 July 2016. It would be helpful if responses to the questions include justification and explanation.

It would be helpful if responses are not confidential. If you require your response to remain confidential, you should clearly state this on the coversheet of the response. We intend to publish all non-confidential responses. Please note that, in any event, all responses will be shared with the Regulatory Authorities.