Consultation on DS3 System Services Protocol Document

4th March 2022

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EXECUTIVE SUMMARY

The purpose of this paper is to provide an opportunity for stakeholders to provide feedback on the proposals to amend the DS3 System Services Protocol document – Regulated Arrangements, Version 3.0, published 1st October 2020.

This paper should be read in conjunction with the accompanying redlined Protocol document. The Protocol document specifies the Compliance Requirements which a service provider must satisfy before qualifying for remuneration for DS3 System Services in respect of its Providing Unit(s), as well as the Performance Monitoring procedures to be applied and the unit(s)' Operational Requirements. The document forms part of the DS3 System Services contractual arrangements.

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1. INTRODUCTION

1.1. EirGrid and SONI

EirGrid and SONI are the Transmission System Operators (TSOs) in Ireland and Northern Ireland. It is our job to manage the electricity supply and the flow of power from generators to consumers.

We have a responsibility to enable increased levels of renewable sources to generate on the power system while continuing to ensure that the system operates securely and efficiently. Our Delivering a Secure Sustainable Electricity System (DS3) programme seeks to address the challenges of increasing the allowable System Non-Synchronous Penetration (SNSP) up to 75%.

A key component of the current DS3 programme is the System Services work stream. Its aim is to put in place the correct structure, level and type of services in order to ensure that the system can operate securely with these higher levels of non-synchronous generation.

1.2. Overview of System Services

EirGrid and SONI have licencing and statutory obligations to procure sufficient system services to enable efficient, reliable and secure power system operation. DS3 System Services are the contractual arrangements in Ireland and Northern Ireland for twelve system services (SIR, FFR, POR, SOR, TOR1, TOR2, SSRP, RRS, RRD, RM1, RM3, and RM8).

These 12 system services are required to support a move to higher levels of nonsynchronous generation. Table 1 provides a high-level summary of the current and proposed DS3 System Services.

Table 1: Summary of DS3 System Services[1]

Service Name	Abbreviation	Unit of Payment	Short Description
Synchronous Inertial Response	SIR	MWs^{2}h	(Stored kinetic energy)*(SIR Factor – 15)
Fast Frequency Response	FFR	MWh	MW delivered between 2 and 10 seconds
Primary Operating Response	POR	MWh	MW delivered between 5 and 15 seconds
Secondary Operating Response	SOR	MWh	MW delivered between 15 to 90 seconds
Tertiary Operating Response 1	TOR1	MWh	MW delivered between 90 seconds to 5 minutes
Tertiary Operating Response 2	TOR2	MWh	MW delivered between 5 minutes to 20 minutes
Replacement Reserve - Synchronised	RRS	MWh	MW delivered between 20 minutes to 1 hour
Replacement Reserve - desynchronised	RRD	MWh	MW delivered between 20 minutes to 1 hour
Ramping Margin 1	RM1	MWh	The increased MW output that can be delivered with a good degree of certainty for the given time horizon.
Ramping Margin 3	RM3	MWh	
Ramping Margin 8	RM8	MWh	
Fast Post Fault Active Power Recovery	FPFAPR	MWh	Active power (MW) >90% within 250ms of voltage >90%
Steady state Reactive Power	SSRP	Mvarh	(MVAr capability)*(% of capacity that MVAr capability is achievable)
Dynamic Reactive Response	DRR	MWh	MVAr capability during large (>30%) voltage dips

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[1] Further detail on the DS3 System Services can be found at: http://www.eirgridgroup.com/how-the-grid-works/ds3-programme/

1.3. Purpose of Document

The purpose of this consultation paper is to set out the proposed amendments to the Protocol document as contained in the marked up version associated with this consultation. The Protocol document specifies the Performance Monitoring procedures to be applied by the TSOs. It also contains operational requirements, specifying minimum standards that Providing Units must meet in order to receive payments for these services.

In order to reduce the number of units that are entering into the Data Poor Performance Scalar assessment category, a proposal has been made to reduce the threshold used to determine when to performance monitor FFR, POR, SOR and TOR1. This will enable an increase in the number of assessments being carried out and therefore reduce the number of units being impacted by the Data Poor Performance Scalar. The threshold used to determine when to performance monitor FFR is proposed to be reduced from 1MW to 0.2MW. The threshold used to determine when to performance monitor POR, SOR and TOR1 is proposed to be reduced from 1 MW to 0.5 MW. These proposals are detailed in section 2.1.

A proposal to modify the assessment of Ramping Performance is included whereby through the use of publicly available Single Electricity Market (SEM) settlement data, we can monitor how accurately a providing unit follows their MW instruction. We believe this to be a more realistic measure of assessment for a Ramping Margin product.

The final proposal put forward in this paper is to align the assessment of the DS3 SS POR service with the average assessment methodology for the SOR and TOR1 services. We believe an assessment of POR based upon a nadir in a 5 to 15 second period is no longer appropriate. The proposed change would take the form of an assessment of the average provision requirements between 5 and 15 seconds.

Minor modifications have been proposed to the Protocol document to ease the understanding of, and further develop the requirements and procedures being presented.

1.4. Proposed Consultation Process

- Section 2 of this paper presents an overview of the main differences between the DS3 System Services Protocol – Regulated Arrangements, 1st October 2020, Version 3.0 and the proposed marked up version accompanying this paper.
- A number of consultation questions address the proposed modifications. These are spread throughout section 2 and repeated in summary form at the end of the paper.

2. Overview of changes to the Protocol document

2.1   Threshold for Performance Monitoring of FFR, POR, SOR and TOR1

In order to reduce the number of units that are entering into the Data Poor Performance Scalar assessment category a proposal has been made to reduce the threshold used to determine when to performance monitor FFR, POR, SOR and TOR1. This will result in an increase in the number of assessments being carried out and therefore reduce the number of units that otherwise would have been impacted by the Data Poor Performance Scalar. The threshold used to determine when to performance monitor FFR is proposed to be reduced from 1 MW to 0.2 MW. The threshold used to determine when to performance monitor POR, SOR and TOR1 is proposed to be reduced from 1 MW to 0.5 MW.

The change has been made to the Protocol document for the POR service (Section 5.8.2.6), the SOR service (Section 5.9.2.5) and the TOR1 service (Section 5.10.2.5).

With regards to the threshold for performance monitoring the FFR service, the reason why a lower metric, 0.2 MW, is proposed is due to higher resolution of data being available for performance assessment of FFR. This change is detailed in Section 5.14.1.2 of the Protocol Document.

This change had previously been presented in the DS3 Protocol Version 3 consultation, however, an error in how it would be applied to the text of the tracked version of the Protocol occurred. This resulted in the change not being recommended due to the industry responses not being favourable. We have since clarified the change and the correct thresholds changed in the tracked version attached to this consultation.

Question 1: Do you have any comments on the proposal to reduce the threshold used to determine when to performance monitor FFR, POR, SOR and TOR1?

2.2   Ramping Margin Performance Assessment methodology revision

As stated in the version 3 Protocol consultation the current Ramping Margin Performance assessment methodology was under review following feedback from industry.

The fail sync process which is currently employed is not an adequate method of assessment for a Ramping Margin product.

We note that monitoring for 3 or 8 hour ramping is almost impossible for certain units. It is our intention therefore, through the use of publicly available SEM data, to monitor how accurately a providing unit follows their MW instruction. We believe this to be a more realistic measure of assessment for a Ramping Margin product. It will also provide more transparency and will simplify the calculation process since the profiling is already built into the half-hourly market settlement data.

The following assessment steps are proposed to be carried out to calculate the performance for each Providing Unit contracted for a ramping product on a monthly basis.

The resulting monthly Ramping Margin Performance Assessment Percentage (RPP) will determine how the Monthly Scaling Factor (Km) will be applied to the Providing Unit.

1.   For each Providing Unit the TSOs will identify the assessible Trading Periods in the reporting month where the DQ (Dispatch Quantity) values were different from those in the previous Trading Periods, which indicates ramping in general.

2.   For each of those assessible Trading Periods, the TSOs will evaluate whether the unit has followed those identified DQs, Yes (Y) or No (N) within a tolerance.

   - Tolerance level = Maximum of [5% of DQ] and [2% of Registered Capacity].

   - Tolerance used for under provision only. Over provision is not penalised.

3.   RPP will be calculated as the percentage in the reporting month of those assessible Trading Periods where the unit is Y.

   - RPP will be calculated to 3 decimal places (XX.XXX%).

The TSOs propose the following approach to determine the **Monthly Scaling Factor (K_m)** for RM1 for all Providing Units:

If the RPP of a Providing Unit is 90% or above then $K_m = 0$,

If the RPP of a Providing Unit is 70% or less then $K_m = 1$,

Otherwise, $K_m = (0.9 - (RPP/100))*5$.

We propose to issue a monthly report of the RPP value to each Providing Unit that is contracted for a DS3 System Service that uses the RM1 Performance Assessment for the calculation of their Performance Scalars.

We acknowledge that for some Providing Units there may be a low number of dispatch instructions in a month. We believe that is adequately accounted for by tolerances in the calculation and the use of the Dynamic Time Scaling Factor (V_m). The Dynamic Time Scaling Factor takes into account the previous 5 months with more emphasis on the most recent months. Section 5.4 of the DS3 Protocol explains the Dynamic Time Scaling Factor (V_m) in greater detail.

We have proposed to remove Section 5.16.2.2 'Measurement Process for Ramping Margin 1 (RM1) Performance Assessment for DSUs'. We are not in position to implement this method of assessment for DSUs and believe the proposed new method of assessment will be appropriate for all technology types.

We do not propose to change at this time the current process whereby the Performance Incident Response Factors for the DS3 System Services listed in Table 2 are aligned with the Performance Incident Response Factor (P_E) calculated for RM1.

DS3 System Service	DS3 Protocol Section
TOR2 (dispatch)	5.11.1.2
RRS (dispatch)	5.12.1.2
RRD (dispatch)	5.13.1.2
RM3	5.17.1
RM8	5.18.1

Table 2

Question 2: Do you have any comments on the proposal to change the method of assessment for the Ramping Margin products?

2.3 Method of Performance Assessment of Primary Operating Reserve (POR)

As the level of inertia scheduled on the system has decreased and the maximum allowed RoCoF increased, frequency nadirs have begun to move closer to the time zero of the Frequency Event. The POR service and its definition is somewhat a legacy service in that the product has been brought forward from Harmonised Ancillary Services Agreements and its definition unchanged.

When the POR definition was first compiled it would have been uncommon to have a frequency nadir occur in a sub 5 second timeframe due to higher system inertia. Thus, performance assessment based on a singular data point at the event nadir would have been deemed appropriate. With RoCoF of up to 1Hz/s, events will occur with nadirs in a sub 1 second timeframe from time zero more frequently. In many cases the fast acting response of service providers will not only have arrested the fall in frequency before the 5 second POR assessment period but will also have returned system frequency to a nominal state.

An assessment of POR based upon a nadir in a 5-15 second period is no longer appropriate and as such the TSOs propose amending the assessment of the DS3 SS POR service to align with the assessment methodology for the SOR and TOR services. This would take the form of an assessment of the average provision requirements between 5 and 15 seconds.

Section 5.8 of the tracked version of the Protocol document accompanying this consultation presents the changes to the methodology.

It should be noted that for Synchronous Providing Units, the POR performance will continue to be assessed taking into account the Inertial Response of the Providing Unit reacting to the positive/negative rate of change of Transmission System Frequency at the time at which the maximum POR frequency deviation occurs in the POR period.

Question 3: Do you have any comments on the proposals to modify the performance assessment of the POR service?

2.4   Minor Modifications – Sections 5.25 and 5.26

Section 5.25 'Providing Units with less than the Minimum Data Records Requirements' and Section 5.26 'Performance Testing Process' have had minor modifications made to them as presented in the tracked version of the Protocol published with this consultation paper.

Figure 9 in the Protocol is proposed to be removed as it does not accurately represent a high-level business process flow chart for the performance scalar process.

We are aware of the need to further clarify and document the testing requirements for a providing unit to rectify its scalar back to 1, after entering into the Data Poor Performance Scalar assessment category. Operationally we are engaging with industry and making enhancements to the current test procedures and process.

We will endeavour to address this area in the next DS3 Protocol consultation.

Question 4: Do you have any comments on the minor modifications proposed to sections 5.25 and 5.26?

3. Summary of Consultation Questions

Question 1: Do you have any comments on the proposal to reduce the threshold used to determine when to performance monitor FFR, POR, SOR and TOR1?

Question 2: Do you have any comments on the proposal to change the method of assessment for the Ramping Margin products?

Question 3: Do you have any comments on the proposals to modify the performance assessment of the POR service?

Question 4: Do you have any comments on the minor modifications proposed to sections 5.25 and 5.26?

4. Next Steps

SONI and EirGrid welcome feedback on the proposed changes to the Protocol document. Responses should be submitted to DS3@soni.ltd.uk or DS3@EirGrid.com by 15th April 2022. It would be helpful if responses to the questions included justification and explanation.

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.