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Dear Anna,

### **SO:TO Optimisation Output Delivery Incentive – 2021/22 Final Report**

This letter and supporting SO:TO Optimisation Output Delivery Incentive ('the ODI') final report represent SSEN Transmission's submission in accordance with Part C of Special Condition 4.7 of the electricity transmission licence and the SO:TO Optimisation Governance Document version 1.0<sup>1</sup>. During 2022/23 we delivered one additional project under STCP 11-4 and within scope of the ODI, in addition to the single project already delivered in 2021/22.

The ODI continues to encourage us to proactively consider solutions in the form of enhanced service provisions that minimise outage impact, and, ultimately, pass cost savings to end consumers. We are confident that during the last three years of the RIIO T2 Plan further opportunity to secure benefits for consumers will arise subject to the incentive extending into years three - five of RIIO T2. We have provided a summary of the solutions and consumer benefit delivered and reported on below.

### **Summary of Solutions and Consumer Benefit**

The Errochty – Killin 132kV Overhead Line (ELW) Protection Overload Scheme allows the ESO to maximise capacity on other circuits which cross the B04 boundary between SSENT and SPT. This new relay device will trip the ELW circuit when it reaches its rating limit, opening up spare headroom capacity on the other 6 circuits to be used by the ESO, thereby increasing the boundary's transfer capabilities. The scheme was installed in July 2021, and has given the ESO the opportunity to reduce constraint costs across the boundary since its installation, with costs savings in the 2<sup>nd</sup> year (2022/23) of the trial period forecast by the ESO at £60m.

The Tealing and Alyth 275kV By-Pass Configurations Scheme will circumvent a 10-month outage on the circuit as a Quadrature Booster (QB) is being installed at the Tealing end of the Kintore – Tealing 275kV Overhead Line (XT2). Our recommendation was for two temporary 275kV circuit by-passes. For 2022/23 the ESOs estimated constraint savings for the scheme was £29,954,468m further demonstrating the significant consumer benefit from delivering the scheme.

The consumer benefit associated with delivering these projects under the SO:TO incentive for regulatory year 2022/23 is an estimated £89,954,468m in forecasted constraint cost savings. After deducting the potential incentive reward of £1.2m for SSENT this results in a net consumer benefit of £88,754,468m.

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<sup>1</sup> As directed by Ofgem on 29 March 2021: <https://www.ofgem.gov.uk/publications/soto-optimisation-governance-document>  
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As required within the SO:TO Optimisation Governance Document, we have provided the required information within Appendix A to this letter.

Yours sincerely,

Subhan Shahid  
*Regulation Analyst*

## Appendix A: SO-TO Optimisation Output Delivery Incentive – 2022/23 Final Report

### Details of Solutions Delivered

**Table 1a: Tealing and Alyth 275kV By-Pass Configurations (Installed in 2022/23)**

Activity	Input
Solution Description	<p>Installation of two temporary 275kV circuit by-passes at Tealing and Alyth 275kV substations, to allow return of all 275kV circuits crossing the B02 and B04 transmission boundaries during installation of a new 275kV quadrature booster (QB) on the XT2 feeder bay at Tealing 275kV substation. The QB is being installed at the Tealing end of the 100km Kintore – Tealing 275kV overhead line, XT2.</p> <p>The new QB requires extensive civil foundations and bases within the existing XT2 bay in Tealing substation. Without provision of temporary circuit by-passes these works would require the XT2 circuit on outage for up to 10 months, to provide sufficient space and safety clearance for construction of the new QB bay. Such a long XT2 outage would significantly diminish the B02 and B04 transfer capabilities and incur constraint costs on the ESO.</p>
Date	Solution proposal submitted by SSENT to the ESO on 16 Jun 2022 and approved by ESO on 03 Aug 2022. Solution installed and commissioned by SSENT by 13 Oct 2022.
Cost of Solution	£112,032
Estimated Constraint Savings	£29,954,468 during 2022/23, based on the B02 boundary circuit XT2 (Kintore – Tealing 275kV circuit 2) not being removed from service.
Demonstration of delivery beyond business as usual	<p>Given the scope of the solution it was possible to work quickly with established supplier partners to advance installation of the scheme and accelerate the potential operational savings for the ESO.</p> <p>The solution takes the form of temporary by-pass arrangements, beyond the scope of the main works in the Tealing QBs project and is considered unique and beyond our normal business as usual.</p>

**Table 1b: Errochty – Killin 132kV Overhead Line (ELW) Protection Overload Scheme (Installed in 2021/22, offering constraint cost savings in 2021/22 and 2022/23)**

Activity	Input
Solution Description	<p>Installation of a protection overload relay at Errochty 132kV Substation, on the 132kV circuit breaker bay (1105) which protects the Errochty – Killin 132kV overhead circuit (ELW).</p> <p>ELW is the lowest rated circuit of the seven circuits which cross the B04 boundary between SSENT and SPT. ELW is always the first circuit across B04 to reach its rating limit, which prevents higher power transfers across the boundary whilst spare headroom capacity remains on the other 6 circuits. With the new relay device installed it will now trip the ELW circuit when flows reach its rating limit, to allow the ESO to maximise capacity on the other higher rated boundary circuits, and thus increase the boundary's transfer capability.</p>

Date	Solution proposal submitted to ESO on 4 May 2021 and approved by ESO on 11 May 2021. Solution installed and commissioned on 14 July 2021.
Cost of Solution	£25,705.
Estimated Constraint Savings	For 2021/22 the ESO estimated constraint savings of £2,777,600.  For 2022/23 the ESO estimated constraint savings of £60,000,000. This is based on seasonal average generation conditions, and SSEN Transmission and SPT's submitted outage programmes.
Demonstration of delivery beyond business as usual	Given the scope of the project it was possible to work quickly with established supplier partners to advance installation of the scheme and accelerate the potential operational savings for the ESO.  Being the only protection overload scheme on SSEN Transmission's overhead line and cable network, the solution is considered unique and beyond our normal business as usual.

**Table 3: Overall consideration of the ODI Value**

Consideration	Input
Benefits of the ODI trial	<p>The ODI trial has helped to embed the STCP 11-4 procedures within the wider TO Business, and beyond just the TO Outage Planning team.</p> <p>The ODI has encouraged Project Designers, Project Managers, and appointed Contractors to consider solutions in the form of enhanced service provisions that minimise outage impact, and pass cost savings to the ESO and the end consumer.</p> <p>A measure of its success is consideration of STCP 11-4 services and solutions as business as usual within the TO’s project management procedures as we plan for RIIO-T2 and -T3.</p>
Unintended consequences and or inefficiencies of the ODI design	<p>The 2-year timespan of the ODI trial is considered too short to incentivise delivery of a sufficient range of services and solutions to reduce the ESO’s operational costs. Normally it requires time to identify and develop suitable solutions, followed by agreement and approval between the TO and ESO, and then a period of detailed design, equipment procurement, site installation, and final commissioning.</p> <p>Extension to the ODI trial period will significantly support delivery of a wide range of STCP 11-4 solutions and services into the later years of RIIO T2 when the major boundary upgrades and potentially expensive outage combinations are currently intended.</p>
Future value of the ODI	<p>The later years of the RIIO T2 Plan include significant outage activity to modernise and upgrade the network, to contribute to GB’s longer term ‘net zero’ targets.</p> <p>It includes major construction and outage activity on the East Coast network, including the B02 boundary circuits, and the B04 cross-border circuits with SPT. It will bring significant challenges to the ESO to balance the GB network, particularly with the added impact of lower baseload generation in Scotland (with recent de-commissioning of Hunterston) and greater reliance of intermittent renewable generation.</p> <p>A further STCP 11-4 solution at Kintore 275kV substation is currently being developed to restore a long 275kV circuit to the south across the B02 and B04 boundaries, whilst work is being undertaken at Kintore to establish the new 400kV substation. This STCP 11-4 solution should be ready for construction in 2023/24.</p> <p>Continuation of the ODI will encourage and promote wider application of enhanced services and solutions provided by TOs to reduce the ESO’s operational costs, whilst balancing the network, and offer savings to the end consumer.</p>