

# SSEN Transmission RIIO- T1 Network Output Measures (NOMs) Incentive Closeout Performance Report



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# 1 Executive Summary

During RIIO-T1 SSEN Transmission invested over £313.4m in lead asset interventions delivering a monetised risk output equivalent to 165% of the price control target. This investment addressed assets at, or approaching, the point of failure and resulted in an overall reduction in combined average fault rates. The RIIO-T1 price control marked the start of asset health output measurement development, a foundation on which the Network Asset Risk Metric (NARM) targets for RIIO-T2 are based.

SSEN Transmission has a post-normalised Absolute Monetised Risk Target of R£1,280.8m and has delivered a post-normalised Monetised Risk Output of R£1,148.8. Thus, has **over-delivered against our T1 NOMs monetised risk target** by circa **R£132m**. Alongside the over-delivery against targets, we have overspent £99.3m against our T1 allowances.

The key driver for the over-delivery and (proportionally less) over-spend is significantly more work undertaken on Overhead Lines (OHLs) during the RIIO-T1 period, which includes OHL Conductor, OHL – Fittings and OHL – Towers.

As a responsible Network Operator, we have adapted our planned programme of works to respond to asset condition and deliver the best value for customers. As part of this we have undertaken a number of changes both within asset categories and across asset categories and can justify our over delivery position. Further detail on these changes is provided later in this narrative and significantly more detail and evidence will be provided in our Stage 5 report when justifying our over-delivery.

## 2 Introduction

This Network Output Measures (NOMs) incentive close out report provides an overview of Scottish Hydro Electric Transmission plc's (SSEN Transmission's) performance of NOMs delivery, following the completion of the 8-year RIIO-T1 Price Control.

NOMs provide a means to monitor and assess the network management outcomes that network companies deliver, and we are required to demonstrate how our expenditure is linked to managing our network risk, both at the beginning and end of the RIIO-T1 price control period.

We are obliged to deliver these targets (or an equivalent) considering risk trade-offs. The Licensees are therefore incentivised to deliver the targets, but have the flexibility to amend work programmes and to make appropriate asset management decisions that are both based on the latest information and in the interest of consumers

In RIIO-T1 the TOs were obliged (under special licence condition 2L) to work together to develop and submit a Common Network Output Measures Methodology to convert the risk measure into monetised terms. This is the multiplication of the probability of asset failure by the monetised value of the consequences. The use of monetised risk helps overcome the limitations of using physical quantities of assets in priority bands by:

- defining asset risk in accordance with a common currency for all network assets, enabling meaningful comparison and prioritisation across the full asset base, and
- expressing in monetary terms the expected direct and indirect consequences for consumers of asset failures, enabling a balance between costs and benefits.

This report along with the accompanying RIIO-T1 NOMs data tables constitutes our submission of our performance against this Common NOMS Methodology and the obligations under the following Regulatory requirements:

- Our "Performance Report" as required under paragraph 2M.6 of Special Licence Condition 2M - Specification of Network Replacement Outputs of the RIIO-T1 licence.
- Our report as required under paragraph 7.10.3 of Special Licence Condition 7.10 – Close Out of RIIO-T1 Network Outputs (NOCot) of the RIIO-T2 licence.
- Our stage 1 and stage 2 NOMs submission as required under the NOMs Incentive Methodology Version 2.2 dated 18 June 2021.

### 3 RIIO-T1 NOMs Background

The new RIIO framework adopted for the RIIO-T1 price control identified six key Output Categories (Customer Satisfaction, Safety, Reliability and Availability, Conditions for Connection, Environmental impact, and Social Obligations). The Network Output Measures (NOMs) are secondary deliverables for the Reliability Output Category, whilst Energy Not Supplied (ENS) was confirmed as the primary output in this area. It's important to note and recognise that the RIIO-T1 price control was the first time the concept of NOMs was introduced into the Transmission sector and it was implemented in order to provide Ofgem with a measure to monitor and assess transmission owners (TOs) asset renewal performance over the longer-term. They are a leading indicator of asset performance.

NOMs targets were originally introduced into the TOs licence as Non-Load Related (NLR) volumes-based targets, and Special Licence Condition 2M set out the NOMs target for RIIO-T1 which the TO was funded to deliver. This licence condition obliged TOs to deliver these targets (or a materially equivalent delivery, considering trade-offs) for consumers.

When setting the RIIO-T1 targets, Ofgem anticipated and expected TOs to make asset management decisions which are based on the latest information, and in the best interests of consumers. Therefore, TOs were permitted to make trade-offs both within asset categories and between asset categories in order to deliver an equivalent, or better outcome, to the NOMs target.

SSEN Transmission has made changes to its planned delivery programme which is to be expected considering three factors: a) the NOMs mechanism was a new and immature mechanism, b) our policy of intervening in the best interests of the network/consumers, and c) the delivery programme was submitted up to 10 years ahead of need and network conditions will clearly change over this long period. In delivering our T1 delivery programme SSEN Transmission did not undertake "trade-offs" in the sense of identifying one asset in plan and trading this off with another asset out of plan. Instead, we undertook a delivery programme that was based on the latest information, responding to updated asset information, unforeseen events and delivering interventions in the best interests of customers. These decisions are described within this performance report and will be justified in more detail as part of our 1 December 2021 Stage 5 submission, when we will be justifying our over-delivery against target.

From the outset of the RIIO-T1 price control it was expected that the NOMs mechanism would develop, and this included the expectation for TOs to develop the original volumes-based targets into monetised risk for the TOs to be able to justify its trade-offs and for Ofgem to be able to assess trade-offs between asset categories.

On the 3 December 2020, Ofgem made its decision to approve Rebased Network Replacement Outputs and to modify Special Condition 2M of the electricity transmission licences<sup>1</sup>. The new monetised risk targets became the baseline used to assess the actual delivery programmes of the TOs, however, it is important that Ofgem acknowledges the timing of the rebasing exercise and that the vast majority (if not all) of the asset interventions undertaken by the TOs will have been made under the old NOMs methodology.

In 2018, Ofgem introduced the NOMs Incentive Methodology for implementing close out of the RIIO-T1 incentive arrangements relating to NOMs. This document introduced the general principles for all sectors for the NOMs Incentive Methodology including the seven stages of the methodology which

#### 1.1

<sup>1</sup> [Cover letter: Decision to approve Rebased Network Replacement Outputs and to modify Special Condition 2M of the electricity transmission licences held by the onshore electricity transmission network operators \(ofgem.gov.uk\)](https://www.ofgem.gov.uk/cover-letter-decision-to-approve-rebased-network-replacement-outputs-and-to-modify-special-condition-2m-of-the-electricity-transmission-licences-held-by-the-onshore-electricity-transmission-network-operators)

will be followed, but there was number of outstanding issues that required further clarification ahead of the Close Out process. This included the rebasing of targets and the setting of a materiality threshold (deadband) around target performance. These were expected to be addressed as part of amendments made in 2021 and the revised version of the NOMs Incentive Methodology v2.2. However, Ofgem did not decide upon a materiality threshold and will only do so after the network companies submit their stage 1 and 2 reports.

## 4 Asset Interventions & Definitions

During the T1 period SSEN Transmission has delivered a Non-Load investment programme which consists of asset replacement activities only. Refurbishment activities were not included in the original Business Plan, and we have not carried out any refurbishment activities in our T1 Delivery Plan. This section provides an explanation of the asset and intervention definitions which we have applied, plus the assumptions used in order to report data in accordance with the definitions.

- **Asset Replacement:** An activity undertaken by a network company to remove an existing asset(s) and install a new asset. The asset replacement activity includes:
  - the installation of replacement assets
  - the dismantlement of existing assets where the dismantlement is undertaken as part of the asset replacement works<sup>2</sup>.
- **Asset Refurbishment:** A one-off activity undertaken on an asset that is deemed to be close to end of life or is otherwise requiring intervention that extends the life of that asset or restores its functionality. This activity does not result in the recording of a new or disposed asset in the Asset Register but may improve the health indicator (or probability of failure) of the asset. Refurbishment can include the replacement or reconditioning of components of an asset<sup>3</sup>.

It should be noted for SSEN Transmission that asset replacements include two instances where there was an addition but no existing asset removal. These two occasions occurred for Non-Load circuit breaker (CB) asset replacements: 1) one extra CB was added at Sloy Switching Station (a project in the original Business Plan); and 2) two extra CBs were added at Abernethy (a project substituted into the business plan).

It should also be noted that our Non-Load asset replacements have only been included in the NOMs Close Out Data table where the asset being removed was commissioned prior to the start of RIIO-T1, i.e. formed part of the *Original (Start RIIO-1) NOMs Asset Base*. There is one CB project at Shin where 3 assets were replaced but only 2 have been included in the data table and 5 of the 10 reactor replacements which have not been included in the data table due to this reason.

There are some asset replacements where the asset being replaced appears to be in good condition in the data tables, but the replacement is still necessary. One example of this is the Transformer replacement at Lunanhead. This asset was 11 years old when it failed unexpectedly from what turned out to be a manufacturing defect. Visual condition assessments and oil analysis were all showing the asset to be performing as expected right up until the moment it failed. As a result, there are no poor condition indicators in CBRM to model the asset at an elevated risk.

### 1.1

<sup>2</sup>RIIO-2 Business Plan Data Template (BPDT) Guidance for Network Asset Risk Measure (NARM) Tables – for Electricity Transmission, Gas Transmission, and Gas Distribution

Publication date: 20 September 2019

<sup>3</sup> RIIO-2 Business Plan Data Template (BPDT) Guidance for Network Asset Risk Measure (NARM) Tables – for Electricity Transmission, Gas Transmission, and Gas Distribution

Publication date: 20 September 2019

## 5 General Assumptions

To ensure that all Monetised Risk values and consequence of failure (CoF) values are reported in same price base as the licensee's most recently approved rebased targets none of the financial CoF parameters have been updated. These values have experienced negligible change since rebasing was completed and so will have little effect on the overall numbers. This also removes non-material change from the outputs and the possibility for errors when trying to identify and exclude them.

The system CoF has been fixed as per the configuration of the network as per the start of RIIO-T1. This ensures that no adjustment needs to be made to account for CoF changes to Non-Load assets as a result of load related network changes.

To maintain consistency with the RIIO-T1 rebasing SSEN Transmission has included Wood Poles in the 132kV OHL Towers category, Wood Pole Tops in the 132kV OHL Line Fittings category and Wood Pole Conductor in the 132kV OHL Line Conductor category.

Tabs 3.2 and 3.2.1 Delivery are split into two sections: "Total Network Asset Base (i.e., asset base at the end of RIIO-T1)" and "Original (the start of RIIO-T1) NOMs Asset Base". As per the email from Ofgem on the 17th of May 2021, SSEN Transmission is only submitting the "Original (Start RIIO-T1) NOMs Asset Base" on the 31st of July 2021 with the "Total Network Asset Base (i.e., asset base at end RIIO-T1)" submission following on the 14th of September 2021. However, to ensure that the Ofgem formula in the NOMs Incentive Closeout Template works for the July submission the values of both risk and volumes in the Total Network Asset Base Section are a copy of the values from the Original NOMs Asset Base. This can simply be undone by removing all values in the Total Network Asset Base if it is not required.



## 6 RIIO-T1 Targets

The information contained in table 3.1 and 3.1.1 in the RIIO-T1 NOMs Closeout Data Template is a direct copy of the “SHET Rebasing Data” file output available on the Ofgem Website<sup>4</sup>. The only modification is that the monetised risk values have been divided by 1 million to convert them from R£ into R£m to be consistent with the instructions for populating the pack.

Table 1 – Summary of pre-normalised Targets

Asset Category	Units	Without Intervention	With Intervention	Delta	Units	Replacement Off Intervention Volume	Replacement On Intervention Volume
132kV Circuit Breaker	£m	159.8	109.3	50.6	#	27.0	28.0
132kV Transformer	£m	64.1	52.8	11.3	#	16.0	16.0
132kV Reactors	£m	-	-	-	#	-	-
132kV Underground Cable	£m	29.4	10.7	18.7	km	14.7	14.7
132kV OHL line Conductor	£m	284.7	166.1	118.6	km	927.1	927.1
132kV OHL line Fittings	£m	273.3	273.3	-	#	-	-
132kV OHL Towers	£m	397.3	397.3	-	#	-	-
275kV Circuit Breaker	£m	33.3	31.5	1.8	#	1.0	1.0
275kV Transformer	£m	10.3	10.3	-	#	-	-
275kV Reactors	£m	8.4	8.4	-	#	-	-
275kV Underground Cable	£m	0.1	0.1	-	km	-	-
275kV OHL line Conductor	£m	9.6	9.6	-	km	-	-
275kV OHL line Fittings	£m	13.4	13.4	-	#	-	-
275kV OHL Towers	£m	83.8	83.8	-	#	-	-
400kV Circuit Breaker	£m	-	-	-	#	-	-
400kV Transformer	£m	-	-	-	#	-	-
400kV Reactors	£m	-	-	-	#	-	-
400kV Underground Cable	£m	-	-	-	km	-	-
400kV OHL line Conductor	£m	-	-	-	km	-	-
400kV OHL line Fittings	£m	-	-	-	#	-	-
400kV OHL Towers	£m	-	-	-	#	-	-

Table 1 above shows a summary of the pre-normalised targets set during rebasing and the associated intervention volumes attributable to the risk changes. This has been created using the data contained within tab 3.1\_Targets\_ET and 3.1.1\_Targets\_Volumes\_ET in the RIIO-T1 NOMs Closeout Data Template.

### Without Intervention Risk Values:

These are the forecasted end of T1 risk values, calculated in 2018 during Rebasing, assuming no interventions are made to the assets during the price control and the assets follow the deterioration curves set by the NOMs models taking them from their 2013 starting position to their 2021 ending position. The monetised risk was calculated for every specific plant asset and every span or structure for OHL assets that existed on the network as per the 31st of March 2013 and summed per asset category.

### With Intervention Risk Values:

Where the Business Plan identified an asset or route of OHL assets as being replaced during the price control these assets had their condition set to “as new” and all inspection records and condition measurements removed. This then calculated the monetised risk for a brand-new asset, therefore

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<sup>4</sup> [Statutory consultation on a proposal to approve Rebased Network Replacement Outputs and to modify Special Condition 2M of the electricity transmission licences held by the onshore electricity transmission network operators | Ofgem](#)

modelling the asset replacement. All assets not being intervened on had the same value as the without intervention data set.

During the close out process a few very small issues were identified with the Rebased Targets, these have been identified in the Rebasing Corrections part of the Relevant Risk Changes section and further explained.

#### *Delta:*

Whilst the Transmission Special Licence Condition 2M target is an absolute target the delta between without intervention and with intervention shows that the RIIO-T1 Business Plan set out to deliver a R£201m risk reduction.

#### *Replacement Off/On Intervention Volumes:*

The Replacement Off/On Intervention Volumes show the number of assets being intervened on in more granularity and provides the total volume of work set out in the Business Plan to achieve the risk reduction. Typically, the significant contribution to risk reduction is by removing the old assets, whilst the significant contribution to costs is by installing the new assets.

## 7 RIIO-T1 Delivery

### Without and With Intervention Risk Values

The information contained in table 3.2 and 3.2.1 in the RIIO-T1 NOMs Closeout Data Template has been calculated using the same approach as the Rebased Targets.

Table 2 – Summary of pre-normalised Delivery

Asset Category	Units	Without Intervention	With Intervention	Delta	Units	Replacement Off Intervention Volume	Replacement On Intervention Volume
132kV Circuit Breaker	£m	146.5	104.0	42.6	#	20.0	23.0
132kV Transformer	£m	60.8	41.4 (39.4)	19.4 (21.4)	#	11.0 (15.0)	11.0 (15.0)
132kV Reactors	£m	-	-	-	#	-	-
132kV Underground Cable	£m	33.5	17.2	16.4	km	14.7	20.4
132kV OHL line Conductor	£m	229.2	215.9 (157.9)	13.3 (71.3)	km	484.5 (573.7)	474.7 (554.6)
132kV OHL line Fittings	£m	239.0	201.1 (176.5)	37.9 (62.5)	km	731.1 (820.3)	724.0 (803.9)
132kV OHL Towers	£m	543.6	542.6 (536.3)	1.0 (7.3)	#	28 (253)	16 (394)
275kV Circuit Breaker	£m	24.1	19.8	4.3	#	3.0	3.0
275kV Transformer	£m	13.1	11.5	1.6	#	1.0	1.0
275kV Reactors	£m	8.0	1.7	6.3	#	5.0	5.0
275kV Underground Cable	£m	0.1	0.1	-	km	-	-
275kV OHL line Conductor	£m	8.5	8.5	-	km	-	-
275kV OHL line Fittings	£m	10.8	10.8	0.0	km	100.6	100.6
275kV OHL Towers	£m	65.2	65.2	-	#	-	-
400kV Circuit Breaker	£m	-	-	-	#	-	-
400kV Transformer	£m	-	-	-	#	-	-
400kV Reactors	£m	-	-	-	#	-	-
400kV Underground Cable	£m	-	-	-	km	-	-
400kV OHL line Conductor	£m	-	-	-	km	-	-
400kV OHL line Fittings	£m	-	-	-	km	-	-
400kV OHL Towers	£m	-	-	-	#	-	-

Table 2 above shows a summary of the pre-normalised delivery achieved through undertaking asset interventions, throughout RIIO-T1, and the associated intervention volumes attributable to the risk changes. The values in brackets indicate the values with the COVID delayed schemes included. This has been created using the data contained within tab 3.2\_Delivery\_ET and 3.2.1\_Delivery\_Volumes\_ET in the RIIO-T1 NOMs Closeout Data Template, and data table source data to quantify the COVID delayed schemes.

#### *Without Intervention Risk Values:*

This is the same asset base informing the RIIO-T1 Target “without intervention risk values” but recalculated with the latest condition information available on the 31<sup>st</sup> March 2021. The purpose of this is to replace the rebasing forecast with an actual realised position.

Any variances between the Target and Delivery without intervention position have been identified and detailed in 3.1.1\_Normalisations\_Targets.

#### *With Intervention Risk Values:*

This is the current monetised risk value of the Network, based on the Original (Start RIIO-1) NOMs Asset Base. This includes all the Non-Load asset interventions which have occurred during the Price Control. All assets not being intervened on have the same value as the without intervention data set and checks were made to ensure that the only change in risk has come from the specific assets that have been intervened on.

### Delta:

The delta between without intervention and with intervention shows that during RIIO-T1 SSEN Transmission delivered a pre-normalised risk reduction of **£233.7m** including COVID delayed schemes, £142.8m excluding these schemes. These will be further explained later in the report. The target for RIIO-T1 is an absolute target, so this delta only gives an indication of performance against the Business Plan, with the overall performance set out in the next section.

### Replacement Off/On Intervention Volumes:

The Replacement Off/On Intervention Volumes show the number of assets being intervened on in more granularity and provides the total volume of work set out in the Business Plan to achieve the risk reduction. Typically, the significant contribution to risk reduction is by removing the old assets, whilst the significant contribution to costs is by installing the new assets.

There are variances due to some activities, e.g., circuit undergrounding removing assets from OHL and adding them to UGC.

## SSEN Transmission's Overall Asset Risk Performance During RIIO-T1

Table 3 – Extract of Tab 1.1\_Performance\_Absolute\_Target

		Pre-Normalisation	Post-Normalisation	Difference
Metric	Units			
Risk Without Intervention	£m	1,367.50	1,479.80	112.3
Risk With Intervention (Target Assumed)	£m	1,166.60	1,280.80	114.3
Target	£m	1,166.60	1,280.80	114.3
Risk Output Delivered (With Intervention - Actual)	£m	1,239.60	1,148.80	-90.7
Risk Benefit (Delta) Delivered	£m	128	331	203

Deadband Percentage*	%	0.00%	0.00%
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\* To be advised at Stage 4

		Pre-Normalisation	Post-Normalisation	Difference
Metric	Units			
Deadband Upper Threshold	£m	1,166.60	1,280.80	114.3
Deadband Lower Threshold	£m	1,166.60	1,280.80	114.3

Delivery Scenario	text	Under Delivery	Over Delivery
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Delivery Performance Value (Pre Deadband)	£m	-73	132
Delivery Performance Value (from Deadband)	£m	-73	132

The pre-normalised risk output delivered shows SSEN Transmission with a £73m under delivery for the RIIO-T1 Price control, however with the addition of the COVID delayed schemes this changes to an over delivery of £17.9m. It has been made clear to SSEN Transmission that Ofgem's policy position is that for projects that have suffered short delays because of COVID, will be treated as if delivered.

As will be demonstrated below, a key driver of this over-delivery was due to significantly more work undertaken on OHL projects than originally anticipated at the start of the T1 price control.

**SSEN Transmission has over-delivered against our T1 NOMs Monetised Risk Target by £132m.**

In addition to more work done, a large proportion of this post-normalised over delivery is a net reduction of asset risk, circa R£97.5m, as a result of slower deterioration than forecasted. As illustrated in the Appendix to NGET's Final Proposals<sup>5</sup> deterioration is at the risk of TOs (slower or faster) and it is for the TOs to justify over/under delivery.

Whilst some asset categories have experienced greater deterioration than forecast, for example towers, others have experienced less. The total is a change in less than 7% of the total Network Risk. Given the long-term nature of asset management planning, coupled with improvements to asset data and analysis minor changes such as this are to be expected.

During the RIIO-T1 Price Control SSEN Transmission has undertaken a substantial number of trade-offs both within asset categories and across asset categories.

All the asset interventions were driven by the condition of the assets and the priority of the intervention. Upon further analysis and/or other intervention some assets which were in the original Business Plan were able to have their end of life extended and therefore were deferred, whilst other assets not in plan required immediate intervention, such as transformer failures, assets heavily leaking SF<sub>6</sub>, and OHL schemes requiring full replacement.

A long-term asset manager seeking to ensure the network performs safely and reliably and ensure long-term value for customers, trade-offs and undertaking more / different work than originally anticipated has resulted in an over-delivery against our NOMs target which also correlates with an overspend against our T1 NOMs allowance.

## Trade-offs Between Asset Categories/Schemes

An outline of the trade-offs at an Asset Category Level are summarised below, specific details can be found in the Deferred and Substituted Schemes Section:

### *Circuit Breaker:*

There were 28 x 132kV circuit breakers 1 x 275kV circuit breaker in the original T1 Business Plan.

23 x 132kV CBs have been commissioned compared to the 28 in the original Business Plan. This has delivered a pre-normalised risk reduction of R£43m compared to a target of R£50m. 17 of the original CBs in plan have been completed with the further 6 x 132kV CBs coming from new schemes substituted into plan.

The CBs substituted out of plan were forecast to make a risk reduction of R£12.1m whilst the options substituted back in only made back R£4.3m. A significant proportion of this difference to target comes from removing St Fergus Gas CB replacement from the plan; this would have delivered R£6m risk reduction. The decision not to undertake the works was made when the old NOMs methodology applied, so the contribution to the target was not so significant.

Faster and slower deterioration of the Business Plan CBs also contributed to a change in the risk deduction delivered.

A further 132kV CB has been replaced under Non-Load at Shin, due to excessive gas leakage. However, as the asset was commissioned in the first months of T1 it is not possible to account for it through NOMs. This asset developed severe gas leaks and could not be left on the network.

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<sup>5</sup> Appendix 1 of RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas, 17 December 2012.

3 x 275kV CBs have been delivered compared to 1 in plan. This has delivered a pre-normalised risk reduction of R£4.3m compared to a target of R£1.8m.

As a result of delivering slightly fewer CBs, particularly the deferral of St Fergus Gas, this asset category is slightly under-delivering on pre-normalised risk reduction.

#### *Transformers:*

16 x 132kV Transformers were in the original Business Plan, delivering a forecast risk reduction of R£11.3m. During RIIO-T1 11 x 132kV Transformers have been completed with a further 4 x 132kV transformers forecast to complete due to COVID delays. Including the 4 COVID delayed Transformers, a pre-normalised risk reduction of R£19.4m will be delivered for 132kV assets. An additional R£1.6 pre-normalised risk reduction has been achieved by the replacement of an additional 1 x 275kV transformer.

Of the 16 planned interventions 7 (including 2 COVID delayed units at Lochay) were in the original Business Plan with the remaining 9 (including 2 COVID delayed units at St Fergus Gas) being added in. Of these changes 2 were due to the disruptive failure of assets necessitating immediate replacement.

The projects changed out of the Business Plan were forecast to deliver a risk reduction of R£2.7m, however, the new schemes undertaken will produce a pre-normalised risk reduction of R£14.1m (including the COVID delayed works). The largest contributor to this is Ardmore with a pre-normalised risk reduction of R£7.9m.

As a result of delivering the planned volumes, including COVID delayed projects, and making changes to replace assets carrying more risk, this asset category is overdelivering pre-normalised risk reduction.

#### *Reactors:*

There were no Reactor replacements in the original RIIO-T1 Business Plan, but 5 replacement projects were introduced in to deliver a pre-normalised risk reduction of R£6.3m.

Five further replacements were also completed, however, the reactors being replaced were load additions commissioned after the start of RIIO-T1, where a type of defect rendered the new units unsuitable. Due to the assets not existing at the start of the price control they do not have a NOMs monetised risk value attributable.

As a result of completing projects in this asset category, where none were in Plan, an over delivery pre-normalised risk reduction can be seen.

#### *Underground Cable:*

There were 3 main UGC schemes, where fluid filled cable were replaced for solid cable, totalling 14.7km of replacements with a forecast with a risk reduction of R£18.7m. These schemes were delivered exactly as per the Business Plan.

However, a small number of undergrounding schemes pushed up the delivery to 20.4km UGC with the pre-normalised risk reduction reduced to R£16.4m. This is due to the undergrounding works removing OHL assets, and risk, whilst adding new UGC assets, and risk, back into this category. It should also be noted that three of these undergrounding schemes were paid for by the developer and will be removed from the normalised delivery.

This asset category saw delivery mostly in line with plan, however the additional undergrounding schemes pushed up the risk in this asset category leaving an under delivery of pre-normalised risk reduction.

### *OHL Line Conductor:*

The RIIO-T1 Business Plan contained 19 re-conductoring schemes with a total volume of 927.1km of replacement conductor forecast to deliver a risk reduction of R£118.6m. During T1 7 of these schemes were deferred, with no new OHL Conductor schemes brought into plan, resulting in a delivery of 573.7km and a pre-normalised risk reduction of R£71.5m. This includes the 2 OHL projects which have been delayed due to COVID.

The reasons for deferring the schemes will be covered in more detail in the subsequent sections.

There were three OHL COVID delayed schemes reported to Ofgem earlier in the year. Beaulieu – Inverness – Nairn which made its outage and completed commissioning before the end of RIIO-T1, Inverary – Port Ann which missed its original commissioning outage but has since been commissioned on the 26th of July and Fort Augustus – Quoich where the line was fully constructed prior to the end of RIIO-T1 but missed its commissioning outage which is now scheduled for August 2021.

The 10 OHL Line Conductor project completed from the Business Plan delivered an actual pre-normalised risk reduction of R£13.3m compared to R£16.7m in the Business Plan for completing the same works. This is due to slower than forecast deterioration of the OHL Line Conductor giving a lower than forecast without intervention monetised risk value.

For the same reason, but more extreme due to the configuration of the network on the West, the 2 COVID delayed schemes will deliver R£58m monetised risk reduction when commissioned but should have delivered R£97.6m according to Business Plan.

Finally, the 7 schemes deferred from RIIO-T1 would only have contributed an additional R£4.1m monetised risk reduction had they been completed, this reinforces the decision to amend our plan and undertake priority works.

As a result of delivering fewer kilometres of re-conductoring and slower than forecast deterioration, this asset category is under-delivering on pre-normalised risk reduction, even when including the COVID delayed projects. However, it should be noted that the schemes with the greatest benefit have been delivered as they have contributed a greater proportion towards the risk target for this asset category.

### *OHL Line Fittings:*

The RIIO-T1 Business Plan contained no OHL Line Fittings replacement projects, however 803.9km OHL fittings have been delivered with a pre-normalised risk reduction of R£62.7m. Most of these schemes were added in during the re-conductoring works as the existing fittings were deemed to be unsuitable due to condition or not technically capable of carrying the replacement conductor.

There were 3 OHL conductor schemes in the Business Plan where the conductor condition did not require replacement during RIIO-T1, however the fittings did. A further 2 new fittings only schemes were added into Plan as emergency works.

The under delivery in OHL Line Conductors has been offset by a significant over delivery in OHL Line Fittings. The inclusion of many kilometres of fittings replacements has reduced a significant amount of additional risk and compensated for the reduced volumes of conductor replacement by enhancing the scope of the conductor schemes delivered.

### *OHL Towers:*

The RIIO-T1 Business Plan contained no OHL Tower replacement projects, however 394 new OHL structures have been delivered with a pre-normalised risk reduction of R£7.3m. Except for the undergrounding works which required new terminal towers, these tower replacements came from two schemes Fort Augustus – Quoich and Inverary – Port Ann. Both these schemes are COVID delayed



but are physically constructed, with Inverary – Port Ann now commissioned and Fort Augustus - Quoich waiting for an outage to commission.

The under delivery in OHL Line Conductors has also been offset by an over delivery of OHL Towers. The inclusion of 2 Tower Line rebuilds has compensated for the reduced volumes of conductor by enhancing the scope of the schemes delivered, once the COVID delayed schemes are accounted for.

## Trade-offs between Different Types of Intervention

The SSEN Transmission RIIO-T1 Business Plan contained only asset replacement works; there were no refurbishment projects. During the delivery of the Business Plan asset replacement projects have been deferred out and substituted into Plan, but there have been no trade-offs with refurbishment activities as they were not deemed to be the correct course of action on any of the delivered schemes. We provide detailed justification below.

## Deferred and Substituted Scheme

### *Circuit Breaker:*

Ofgem Scheme	Named Scheme	Reason for deferral from Business Plan
SH-00153	Persley	The immediate condition issue is being managed and the replacement will become part of the whole system plan for Aberdeen.
SH-00156	Milton of Craigie switchgear replacement	The immediate condition issue is being managed and the replacement will become part of the whole system plan for Dundee.
SH-00157	St Fergus Mobil CB's	The ongoing corrosion issues were not adequately addressed by the initial proposed solution and is currently being managed on site. A permanent solution has been developed for T2.
SH-00155	Keith 132kV CBs	The project was originally developed to address the need to replace 4x 132kV circuit breakers that were suffering from SF6 leakage, this was later amended to the emergency replacement of one CB only. CB 405 was completely removed as part of the LT000099 works. CB 505 and CB 705 replacement were deferred to RIIO T2 period as part of the Keith 132kV Substation project, LT000246. CB 605 developed a serious fault and was replaced with a new unit.

Ofgem Scheme	Named Scheme	Reason for adding to Business Plan
SH-00504	Keith 275kv CB	The need for intervention on the CB was identified as a result of an increasing rate of SF6 leakage, which could not be mitigated.
SH-00411	Abernethy CB (on GT1 & GT2)	The need for intervention came about because of problems reported with the operating mechanism and conditions assessment giving the assets a poor health score.



SH-00412	Brechin CB	The need for intervention came from SF6 leaks of the circuit breaker
SH-00646	Shin 132kv CB's	The need for intervention came from the consistent SF6 leaks the dead tank circuit breakers suffered from.
SH-00410	Foyers L35	This was an additional CB left over from the GA10 "airblast" replacement project predominantly completed in the previous price control.

#### *Transformer:*

Ofgem Scheme	Named Scheme	Reason for deferral from Business Plan
SH-00146	Dudhope GSP	The transformers were in better condition than initially expected. The replacement will be considered as part of the whole system plan for Dundee.
SH-00150	Milton of Craigie GSP	The transformers were in better condition than initially expected. The replacement will be considered as part of the whole system plan for Dundee.
SH-00151	Nant PS	The replacement need was downgraded following detailed condition assessments in 2015, and the project was planned to be cancelled for delivery within RIIO T1.
SH-00152	Sloy PS and GSP	<ul style="list-style-type: none"> <li>An additional pre-intervention condition assessment of the assets had identified the assets had not deteriorated as projected during RIIO T1 period and could safely remain in service until the T2 regulatory period.</li> <li>A requirement to prioritise other emergent projects which were not accounted for in the original RIIO T1 Period Business Plan.</li> </ul>
SH-00159	Willowdale GSP	The transformers were in better condition than initially expected. The replacement will be considered as part of the whole system plan for Aberdeen.

Ofgem Scheme	Named Scheme	Reason for adding to Business Plan
SH-00425	Harris TX replacement	The "Harris TX replacement" was originally developed to address the need to intervene at the site to address the extensive and persistent issues associated with corrosion on the transformers due to its proximity to the coast and therefore high saline environment.
SH-00426	Ardmore TX replacement	The "Ardmore TX replacement" was originally developed to address the need to intervene at the site to address the extensive and persistent issues associated with corrosion on

		the transformers due to its proximity to the coast and therefore high saline environment.
SH-00432	Tealing SGT1 replacement	The “Tealing SGT1 replacement” was originally developed to address the need to intervene at the site due to troubling and persistent test results indicating the imminent failure of the super grid transformer
SH-00433	Brora GT Replacement	The “Brora GT Replacement” was originally developed to address the need to intervene at the site due to the poor asset health found during routine testing.
SH-00435	St Fergus Gas GT Replacement	The “St Fergus Gas Terminal Grid Transformer Replacement” was originally developed to address the need to replace the transformers suffering from age related deterioration accelerated by the extreme coastal environmental conditions.
SH-00507	Stornoway Transformer Replacement	The “Stornoway Transformer Replacement” was originally developed to address the poor asset health of the grid transformer. The criticality of the transformer and surrounding electrical infrastructure also influenced the urgency of the intervention as the assets are at the end of a long radial circuit
SH-00563	Nant Emergency	The “Nant TX - Emergency” was not originally developed in the T1-Plan. However, a catastrophic failure due to a fire occurred in September 2017 requiring an intervention to bring the transformer and substation back to an operable state.
SH-00651	Lunanhead GT2 Tx replacement	A disruptive failure of the Oil Containment system. Transformer replacement was immediately required.

#### Reactor:

Ofgem Scheme	Named Scheme	Reason for adding to Business Plan
SH-00432	Tealing 33kV Reactor Installation	The 33kV reactor was also changed as part of the SGT works, as there was a requirement to rebuild the transformer bund, and this was not possible with the current position of the reactor. It is not advisable to reposition a unit of this vintage and the call was made to replace the unit.
SH-00508	Kintore 33kV Reactor Installation	The reactors were experiencing issues with on-going high levels of noise / vibrations. A type defect was identified which would lead to the failure of the asset.
SH-00509	Fort Augustus 33kV Reactor Installation	The reactors were experiencing issues with on-going high levels of noise / vibrations. A type defect was identified which would lead to the

		failure of the asset. (These replacements have not been included in the NOMs data tables.)
SH-00510	Beauly 33kV Reactor Installation	The reactors were experiencing issues with on-going high levels of noise / vibrations. A type defect was identified which would lead to the failure of the asset. (These replacements have not been included in the NOMs data tables.)
SH-00511	Dounreay 33kV Reactor Installation	The reactors were experiencing issues with on-going high levels of noise / vibrations. A type defect was identified which would lead to the failure of the asset.

#### *Underground Cable:*

Ofgem Scheme	Named Scheme	Reason for adding to Business Plan
SH-00522	Sooty Wells Diversion	The "Sootywells Diversion" was originally developed to address the need to re-route this section of the line that runs through Sootywells Farm due to health and safety concerns for both the operation of the farm, and the safety and security of the OHL.

#### *OHL Line Conductor:*

Ofgem Scheme	Named Scheme	Reason for deferral from Business Plan
SH-00172	Beauly - Deanie 132kV OHL reconductoring	There were a number of clearance infringements that required intervention to maintain statutory clearances, in order to meet current design standards. It would have been necessary to replace or raise a number of towers and upgrade several foundations along with significant steelwork changes. This was not possible due to environmental restrictions around the circuit. The project was deferred to RIIO T2 to allow for a whole system plan to be developed for the area.
SH-00174	Charleston - Elmwood 132kV OHL reconductoring	It was decided to defer the CGN/CGS OHL refurbishment from RIIO-T1 and re-evaluate it as part of an overall upgrade strategy for the wider Dundee City Transmission network.
SH-00181	Inveraray - Taynuilt 132kV OHL reconductoring	Generation connection agreements in the North Argyll area have redistributed loading on the Kintyre network such that the Inveraray – Ardbrecknish 132kV OHL element is no longer required. Deferred into RIIO-T2 as part of the whole system strategy for the Argyll network.
SH-00185	Nant tee 132kV OHL reconductoring	Works on Nant Tee line were planned to coincide with the replacement of the transformer in Nant Power Station. However, a disruptive failure of the transformer in Nant Power Station required emergency replacement of the transformer.

SH-00186	Shin - Cassley 132kV line reconductoring	After condition surveys it was determined that the OHL conductors did not require replacement, however fittings were added to scope for replacement due to condition.
SH-00187	Shin-Mybster 132kV OHL reconductoring	The priority was to provide ongoing security on the existing Shin to Mybster OHL and address those critical assets that required urgent attention. Therefore, replacement of the fittings across the line were prioritised while the reconductoring works were deferred.
SH-00190	Whistlefield - Dunoon 132 kV line reconductoring	A subsequent detailed asset condition evaluation; identified further deterioration of circuit earth conductors and circuit insulators, and better than anticipated phase conductor condition. Intervention was limited to fittings replacement.

#### *OHL Line Fittings:*

Ofgem Scheme	Named Scheme	Reason for adding to Business Plan
SH-00450	Quoich to Broadford	Condition assessment of this single circuit 132kV Quoich to Broadford (QB1) overhead line in 2013 identified significant wear on the phase and earth fittings in particular shackles, U bolts and phase conductor ball end links.
SH-00454	Kintore Blackhillock Polymeric replacement	Emergency works required due to condition of the fittings. A condition assessment of the line has revealed a marked deterioration in mechanical performance of the fittings.

In addition to the above-named schemes added into the plan, the scope of many existing OHL Line Reconductoring works was enhanced during project development to include OHL Line Fittings replacements.

#### *OHL Line Tower:*

There were no new OHL Tower Schemes added, but during project development for the Fort Augustus – Quoich and Inverary - Port Ann OHL Line Reconductoring projects it was identified that the OHL Tower Structures should be replaced adding to the scope of the existing projects.

### Other Non-NOMs Intervention Activities

There were three undergrounding schemes during RIIO-T1 which contribute to our Monetised Risk Reduction but were funded by the developer.

- Between Fiddes and Craigiebuckler (CF) a 0.6km section was undergrounded for the Aberdeen By-pass, this was funded by Aberdeen Council.
- Between Nairn and Elgin (NEN - NES) a 1.8km section was undergrounded for a housing developer, this was funded by the developer.
- Between Kintore and Craigiebuckler (XCN/XCS) a 0.4km section was undergrounded for an Industrial development, this was funded by the developer.

These schemes are made up of the removal of the original OHL assets and the addition of new Terminal OHL assets and UGC. This will have a monetised risk reduction not funded through RIIO-T1 NOMs. Therefore, the risk reduction has been removed from the post-normalised delivery so that it is

excluded from the NOMs Incentive Closeout. Further details are included in the Covered by Other Mechanisms part of the Relevant Risk Changes Section.

## 8 Relevant Risk Changes

During the population of the data table the following Relevant Risk Changes have been captured, with further details below.

During this process it was ensured that the outcome of applying all Relevant Risk Changes enable the normalised delivery and normalised targets to be compared on a like-for-like bases suitable for the purpose of implementing the NOMs Incentive Mechanism.

### Normalisations Targets:

#### Data Cleanse

Data cleanse normalisations have been applied where it has been discovered that there were errors in the data that was used to calculate the Rebased Targets. These are outlined in more detail below:

##### *132kV Circuit Breaker:*

<b>132kV Circuit Breaker</b>	<b>Data Cleanse - Without Intervention (R£m)</b>	<b>Data Cleanse - With Intervention (R£m)</b>
<b>Total</b>	<b>-0.5</b>	<b>-1.4</b>
Brechin 320	-1.4	-1.4
Brechin 110	0.9	0.0

An error was identified where an asset condition data point was applied to the wrong asset in Rebasing, which has subsequently been corrected in the latest data set. This condition data meant Brechin CB 320 was showing a worse condition in Rebasing than Close Out, whilst Brechin CB 110 was showing in better health.

The error was fixed by running CBRM with the condition data applied and removed from both assets to calculate the variance caused by it, allowing the data cleanse monetised risk value to be quantified. The additional risk caused was then removed from CB 320 on both the with intervention and without intervention views and the additional risk added back on to the CB 110 without intervention view. CB 110 was replaced during the RIIO-T1 price control and so no correction is required to them with intervention view as it is a different asset.

##### *132kV Underground Cable:*

<b>132kV Underground Cable</b>	<b>Data Cleanse - Without Intervention (R£m)</b>	<b>Data Cleanse - With Intervention (R£m)</b>
<b>Total</b>	<b>3.5</b>	<b>3.5</b>
CGN	2.1	2.1
CGS	1.4	1.4

An error was identified in the Charleston – Glenagnes (CGN & CGS) circuit underground cables which affected their Monetised Risk Values. During Rebasing the condition information for this circuit had not applied correctly in CBRM so the asset showed a better-than-expected condition in Rebasing than Close Out, where the error had since been corrected. Due to this being a fluid filled cable, which carries a much higher risk, a small change to the asset PoF is magnified into a large risk change.

This was corrected by removing the additional risk from both the without and with intervention monetised risk values and has been applied as data cleanse. The data was not new information, but information held that didn't flow through the model properly during Rebasing.

This is a cable that has not undergone any intervention in RIIO-T1, and the normalisation applies to both with and without intervention, this effectively excludes this correction from having an impact to the post-normalised Delivery Position.

#### *132kV OHL Line Conductor:*

<b>132kV OHL Line Conductor</b>	<b>Data Cleanse - Without Intervention (R£m)</b>	<b>Data Cleanse - With Intervention (R£m)</b>
<b>Total</b>	<b>0.0</b>	<b>0.0</b>
CF	0.0	0.0

It was identified that OHL Conductor span CF 87-88 on the Craigie Buckler – Fiddes (CF) line had not been added back into the without intervention Rebasing data set. This span was removed due to some undergrounding works carried out during the Price Control but would have been present at the start.

The correction is R£2,557 being added back on to the without intervention normalisation to remove the impact of this.

#### *132kV OHL Line Fittings:*

<b>132kV OHL Line Conductor</b>	<b>Data Cleanse - Without Intervention (R£m)</b>	<b>Data Cleanse - With Intervention (R£m)</b>
<b>Total</b>	<b>0.0</b>	<b>0.0</b>
CF	0.0	0.0

It was identified that OHL Fittings span CF 87-88 on the Craigie Buckler – Fiddes (CF) line had not been added back into the without intervention Rebasing data set. This span was removed due to some undergrounding works carried out during the Price Control but would have been present at the start.

The correction is R£5,039 being added back on to the without intervention normalisation to remove the impact of this.

#### *132kV OHL Towers:*

<b>132kV OHL Towers</b>	<b>Data Cleanse - Without Intervention (R£m)</b>	<b>Data Cleanse - With Intervention (R£m)</b>
<b>Total</b>	<b>109.3</b>	<b>109.2</b>
QB1	109.3	109.2
CF	0.0	0.0

There was an error identified with the Quoich – Broadford (QB1) OHL towers, where a naming error in the condition information file prevented it from being correctly applied to the CBRM model in Rebasing. The condition values had used the QB1 – (x), to denote a double circuit tower strung on one side, but this was not used in the asset register where the nomenclature QB1 had been used causing the data sets not to match.

Although this comes though as a large data cleanse it is isolated to a single 63km tower line with 301 towers. As has been discussed previously with Ofgem, the radial circuits on SSEN Transmission's network out to the islands cause huge System Consequence values due to the large demand on un-reinforced single circuits. A relatively small change in PoF causes a large change in Monetised Risk which is then compounded by the 301 structures on that route, where the failure of any single one is enough to cause an outage.

This is also the likely reason the error was not spotted in Rebasing, as the circuit already carried a very high risk.

This has been applied as data cleanse as the data was not new information. It was information that held that didn't flow through the model properly during Rebasing.

The OHL Towers on this line have not undergone any intervention in T1 and the normalisation applies to both with and without intervention. This effectively excludes this correction from having an impact to the Normalised Out-Turn Position.

The other error identified was Tower 87 on the Craigie Buckler – Fiddes (CF) line had not been added back into the No-Intervention Rebasing data set. This tower was removed due to some undergrounding works carried out during the Price Control but would have been present at the start.

The correction is R£18,861 being added back on to the without intervention normalisation to remove the impact of this.

#### *275kV Underground Cable:*

<b>275kV Underground Cable</b>	<b>Data Cleanse - Without Intervention (R£m)</b>	<b>Data Cleanse - With Intervention (R£m)</b>
<b>Total</b>	<b>0.0</b>	<b>0.0</b>
BC1	0.0	0.0
BC2	0.0	0.0

An error was identified in the Beaulay – Knocknagel (BC1 & BC2) circuit underground cables which affected their Monetised Risk Values. In rebasing the data set had each with a circuit length of 4.2km, when in fact the actual length used in the T1 Close Out data set is 1.3km.

The error came about as the rebasing data set had summed all three phases triple counting the length, which had been corrected by the time of closeout. Since the monetised risk of an underground cable is a function of the length, the monetised risk value had reduced between Rebasing and Closeout as the length reduced. However, due to this being a solid cable the risk is very small and so the impact almost negligible. The correction is -R£589 for BC1 and -R£486 for BC2.

This is a cable that has not undergone any intervention in RIIO-T1, and the normalisation applies to both with and without intervention. This effectively excludes this correction from having an impact to the Normalised Out-Turn Position.

### Methodology Change

In August 2018 Ofgem made the decision not to reject the modified Transmission NOMs Methodology<sup>6</sup>. Following on from this SSEN Transmission submitted a first draft of T1 NOMs Rebased Targets using this methodology in July 2019, these targets were then accepted by Ofgem in December 2020<sup>7</sup>.

With the methodology change and agreement of the Rebased Targets occurring towards the end of the price control there has been no significant further work undertaken on the NOMs Methodology. Therefore, there is no component of Relevant Risk Change due to Methodology Change.

All work is done using the most recent methodology so zero is entered in this column.

#### 1.1 \_\_\_\_\_

<sup>6</sup> [Decision to not reject modified electricity transmission Network Output Measures \(NOMs\) Methodology Issue 18 | Ofgem](#)

<sup>7</sup> [Decision to approve Rebased Network Replacement Outputs and to modify Special Condition 2M of the electricity transmission licences held by the onshore electricity transmission network operators | Ofgem](#)



## Consequence of Failure (CoF) Changes

As explained in the General Assumptions Section all CoF parameters and the Network configuration have remained fixed since Rebasing to ensure that there are no CoF changes. For this reason, zero is entered in this column.

## Pre-RIIO-T1 Work True-Up

During Rebasing in July 2019 SSEN Transmission used a roll-back approach to derive the network risk at the start of RIIO-T1. For this approach a dataset was created containing all the assets that existed on the network as of the start of the Price Control. This was achieved by undoing any asset replacements and removing any load related works which had occurred up to this point. This took care of any true-up that otherwise might have been needed between submitting the Business Plan and starting the Price Control. As a result, a Trued Up RIIO-T1 starting position was achieved during rebasing for setting the targets and carried forward into the Close Out process.

As a result of this all values in this column are entered as zero.

## Slower/ Faster Deterioration (GD)

As per the Guidance, for the transmission companies, slower/faster deterioration will not be reported as a Relevant Risk Change and is reported as zero in this column.

## Rebasing Corrections

There were a small number of assets where the without intervention and with intervention values showed a very small variance in the Rebasing data set. This wasn't picked up at the time as the numbers are so small in the context of the whole Network Risk totals, but when accounting for every risk change in the T1 Closeout Data Table they have been identified and the effect removed to ensure that all the values tie up and risk changes are only attributable to asset interventions.

<b>132kV Underground Cable</b>	<b>Rebasing Correction - Without Intervention (R£m)</b>	<b>Rebasing Correction - With Intervention (R£m)</b>
<b>Total</b>	<b>0</b>	<b>2.9</b>
RFE	0	1.5
RFW	0	1.5

It was noticed that the Redmoss to Clayhills (RFE – RFW) UGC was showing a risk reduction in the with intervention targets data despite this cable undergoing no intervention. The risk was added back in to ensure that the without intervention and with intervention numbers were identical, therefore removing this issue.

<b>132kV OHL Line Fittings</b>	<b>Rebasing Correction - Without Intervention (R£m)</b>	<b>Rebasing Correction - With Intervention (R£m)</b>
<b>Total</b>	<b>0.0</b>	<b>0.0</b>
FFE	0.0	0.0
FFW	0.0	0.0
IN	0.0	0.0

The Fort Augustus – Fort William (FFE-FFW) and Nant Tee (IN) circuit fittings showed some changes between the with intervention and without intervention risk totals in the Rebasing data set. Overall, it is a very small amount with -£2,147 (FFE – FFW) and -£1895 (IN) being removed to account for the difference and remove any effect. During Rebasing the condition data has matched wrongly to a small number of spans causing the variance on fittings where there should have been none as there were no fittings interventions in plan for FFE – FFW and IN.

<b>275kV OHL Line Fittings</b>	<b>Rebasing Correction - Without Intervention (R£m)</b>	<b>Rebasing Correction - With Intervention (R£m)</b>
<b>Total</b>	<b>0.0</b>	<b>0.0</b>
VH	0.0	0.0
HK1	0.0	0.0
XH2	0.0	0.0

There is a short 2.4km stretch between Blackhillock – Keith (VH – HK1/XH2) which has undergone considerable re-configuration under Load-Related project delivery. These changes caused the condition data to incorrectly match during the rebasing and cause a difference between the with intervention and without intervention risk values where there should have been no difference. Overall, it is a very small amount with -R£1,799 being removed to account for the difference and remove any effect.

### Impact of Change in Asset Base Over RIIO-T1

This column is automatically calculated by comparing the difference between the Non-Load assets data set and the Full Network position data sets. For the 31<sup>st</sup> of July Submission the Full Network Position has not been reported but will be submitted on the 14th of September<sup>8</sup>. Currently the Non-Load network is reported twice in Tab 3.2.1 in both the “Total Network Asset Base (i.e., asset base at end RIIO-T1)” and “Original (Start RIIO-T1) NOMs Asset Base” sections to prevent the spreadsheet from breaking and allow us to check the data table has been populated accurately. As a result, these columns sum to zero for this submission, but will show a variance when re-submitted on 14th of September<sup>9</sup>.

### Normalisations Delivery:

#### COVID Delayed Schemes

The without intervention and with intervention Monetised Risk values were calculated for all the assets in the COVID delayed schemes. However, to allow Ofgem to view the effect of these delays on SSEN Transmission’s RIIO-T1 delivery they have been excluded from the pre-normalisation delivery values.

The with intervention risk values have been replaced by the without intervention data to show no risk change associated with these projects. The risk reduction achieved by carrying out the works has then been added back into the Tab 3.3.2 so that these schemes contribute to our Post Normalisation Delivery. The values are negative as they show a net reduction in risk for the asset replacements.

The totals reported in this table are made up of the following asset categories and schemes:

<b>132kV Transformer</b>	<b>COVID Delayed Schemes With Intervention (R£m)</b>
<b>Total</b>	<b>-2.0</b>
Lochay	-0.9
St Fergus Gas	-1.1

1.1

<sup>8</sup> As per Ofgem email 17 May 2021.

<sup>9</sup> As per Ofgem email 17 May 2021.

Lochay is a scheme to replace 2 x 132kV transformers on the original RIIO-T1 Business Plan whilst St Fergus Gas was added into plan based on the need to replace the 2 x 132kV transformers suffering from age related deterioration accelerated by the extreme coastal environment. These projects have both experienced delays due to COVID and were not delivered by the 31st of March 2021.

<b>132kV OHL Line Conductor</b>	<b>Data Cleanse - With Intervention (R£m)</b>
<b>Total</b>	<b>-58.0</b>
Inverary - Port Ann	-0.14
Fort Augustus - Quoich	-57.81

<b>132kV OHL Line Fittings</b>	<b>Data Cleanse - With Intervention (R£m)</b>
<b>Total</b>	<b>-24.6</b>
Inverary - Port Ann	-0.04
Fort Augustus - Quoich	-24.53

<b>132kV OHL Towers</b>	<b>Data Cleanse - With Intervention (R£m)</b>
<b>Total</b>	<b>-6.3</b>
Inverary - Port Ann	-0.01
Fort Augustus - Quoich	-6.32

Inverary – Port Ann was originally in the Business Plan as a reconductoring project; however, the scope was increased to a complete line re-build during RIIO-T1. The Project experienced delays due to COVID and the line was **fully commissioned on the 26th of July 2021**.

Fort Augustus – Quoich was also originally in the Business Plan as a reconductoring project, however, the scope was increased to a complete line re-build during RIIO-T1. The Project experienced delays due to COVID and whilst construction was completed before the 31st of March 2021 no outage could be taken. A new outage window has now been **planned with SHEPD for August 2021**.

The Inverary – Port Ann project gives a combined risk reduction of R£0.2m whilst Fort Augustus – Quoich gives a combined risk reduction of R£88.7m. Any other Non-Load schemes previously reported to Ofgem as delayed by COVID were able to commission the assets **before the 31st of March 2021** and deliver the outputs during the RIIO-T1 Price Control.

### Covered by Other Mechanisms

There were three undergrounding schemes during RIIO-T1 which contribute to our Monetised Risk Reduction but were funded by the developer and so are being removed from our delivery. The risk reduction achieved by carrying out the works has then been added back into the Tab 3.3.2 so that these schemes do not contribute to our Post Normalisation Delivery. The values for OHL assets are positive as they show a net increase in risk for undoing the asset removals and UGC is negative as the additional risk created by adding new cable needs to be removed.

<b>132kV Underground Cable</b>	<b>Covered by Other Mechanisms With Intervention (R£m)</b>
<b>Total</b>	<b>-0.0</b>
CF	0.00
NEN / NES	0.00
XCN / XCS	0.00

<b>132kV OHL Line Conductor</b>	<b>Covered by Other Mechanisms With Intervention (R£m)</b>
<b>Total</b>	<b>0.0</b>
CF	0.01
NEN / NES	0.00
XCN / XCS	0.00

<b>132kV OHL Line Fittings</b>	<b>Covered by Other Mechanisms With Intervention (R£m)</b>
<b>Total</b>	<b>0.0</b>
CF	0.01
NEN / NES	0.00
XCN / XCS	0.00

<b>132kV OHL Towers</b>	<b>Covered by Other Mechanisms With Intervention (R£m)</b>
<b>Total</b>	<b>0.1</b>
CF	0.02
NEN / NES	0.11
XCN / XCS	0.00

Between Fiddes and Craigiebuckler (CF) a 0.6km section was undergrounded for the Aberdeen Bypass. This was funded by Aberdeen Council and R£28,738 has been removed from our delivery to account for it.

Between Nairn and Elgin (NEN - NES) a 1.8km section was undergrounded for a housing developer. This was funded by the developer and R£11,2034 has been removed from our delivery to account for it.

Between Kintore and Craigiebuckler (XCN/XCS) a 0.4km section was undergrounded for an Industrial development. This was funded by the developer and R£6,921 has been removed from our delivery to account for it.

For these schemes this total is made up of the removal of the original OHL assets and the addition of new Terminal OHL assets and UGC.

## 9 Methodology for Deriving Associated Costs

In order to calculate the costs associated with any over or under-delivery, the subsequent steps should be followed which are relatively straightforward:

- **Identify overall delivery (inc. any over or under delivery):** Identify what over or under-delivery against targets exists for the network companies, if any at all, via an assessment of the asset intervention data and relevant risk changes (noting this requires clarity regarding the deadband).
- **Identify specific project substitutions and additions:** Account for any substitutions made within and across asset categories. This stage will identify what projects were substituted in and out in order to meet the NOMs target and, any additional asset interventions undertaken by the Network Company.
- **Identify the interventions which contribute to the over/under delivery:** Then any additional, or shortfall in, asset interventions should relate to the network company's over or under-delivery.
- **Allocate costs to the over/under delivery on a project-by-project basis:** There should be clear examples of projects, or parts of projects, which would contribute to the over or under delivery and therefore have clear project costs which can be apportioned to the over or under delivery.

SSEN Transmission has over-delivered against target. As responsible asset managers, SSEN Transmission has undertaken asset interventions where necessary including in asset categories where there were no planned interventions in the original RIIO-T1 Business plan, such as reactors, fittings, and towers. There are clear examples of individual projects which relate to this over-delivery and the costs associated with these projects and asset interventions should be included in the second price control period allowances, regardless of whether it is justified or not (as per Table 2 in SpC 2M of the RIIO-T1 licence and Appendix 1 of SpC 7.10 of the RIIO-T2 licence).

As outlined above, a key driver of this over-delivery was due to significantly more work undertaken on OHL projects than originally anticipated at the start of the T1 price control. In addition, interventions were required on Reactors installed, through load-related works, during RIIO-T1 that subsequently began to fail and had to be replaced under Non-Load. As a result, Non-Load work was undertaken and Capex incurred, without any NOMs monetised risk reduction.

## 10 Conclusion

As can be seen in the RIIO-T1 NOMs Closeout Data Tables, which this narrative accompanies, SSEN Transmission has over-delivered against its T1 NOMs monetised risk target by circa R£132m. During RIIO-T1 SSEN Transmission invested over £313.4m in asset replacement and refurbishment delivering a monetised risk output of equivalent to 165% of the price control target.

Table 4 – Comparison between Business Plan and Actual Delivery Risk Reduction and Allowances

Asset Category	Post-Normalised Targets		Post-Normalised Delivery		Delta	
	Business Plan Risk Reduction (R£m)	Business Plan Allowance (£m)	Delivery Risk Reduction (R£m)	Delivery Actual Spend (£m)	Over/Under Delivery (R£m)	Over/Under Spend (£m)
Circuit Breaker	53.3	19.3	68.9		15.6	
Transformer	11.3	64.5	23.5		12.2	
Reactors	0.0	0.0	6.7		6.7	
Underground Cable	15.8	12.2	15.8		-0.1	
OHL line Conductor	118.6	118.1	127.9		9.3	
OHL line Fittings	0.0	0.0	99.4		99.4	
OHL Towers	0.0	0.0	-11.2		-11.2	
<b>Total</b>	199.0	214.1	331.0	313.4	132.0	99.3

Further detail on these amendments and significantly more detail and evidence will be provided in our Stage 5 report when justifying our over-delivery.

The key driver for the over-delivery and over-spend is due to significantly more work undertaken on Overhead Lines (OHLs) during the RIIO-T1 period, which includes OHL Conductor, OHL – Fittings and OHL – Towers. Our asset interventions were driven by the condition of our assets and the priority of the intervention. Some assets which were in our original plan, were in better condition than anticipated upon further inspection and therefore deferred, whilst other assets out with our plan required immediate intervention, such as transformer failures, assets heavily leaking SF6, and OHL schemes requiring full replacement.

Trade-offs, and having to undertake more work than originally anticipated, has resulted in an over-delivery against our NOMs target which also correlates with a significant overspend against our T1 NOMs allowance.

SSEN Transmission can justify this over delivery and expect Ofgem to adjust the relevant allowances in recognition of this.