

RIO-T1 Close Out – Stage 5 Submission

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Executive Summary

During RIIO-T1 we have delivered material improvement in the risk, and therefore reliability, of the transmission network in the north of Scotland on which our demand and renewable generation customers rely.

- Network risk reduction - **21% better** than the reduction in risk for which we were funded - R£54.3m better than our target
- Total remaining network risk - **4.53% better** than the total level of remaining network risk (our Absolute Target) which we were funded to deliver (R£54.3m improvement)
- A more reliable network - over **R£100m reduction** in network risk during RIIO-T1 (including changes in deterioration) with **99.999% network reliability**

This paper provides evidence, justification and conclusions in three key areas of the RIIO-T1 NOMs Close Out assessment process:

1. **Basis of target:** That evidence now confirms the RIIO-T1 settlement did not include all OHL fitting volumes and consequently the delivered risk reduction must be included in our outturn delivery (not be valued at zero).
2. **Materiality of deadband:** That an appropriate deadband for the NOMs Close Out process would be +/- 0.7% of an Absolute risk target, which is equivalent to +/- 5% of a funded Relative risk target and therefore consistent with the policy intent set out by Ofgem in the RIIO-T1 settlement.
3. **Justification of delivery:** We include evidence of all project interventions undertaken in RIIO-T1, demonstrating the need based on network condition and the necessity for replacement during the period. This confirms that we did what Ofgem required of networks – *‘We expect TOs to make asset management decisions which are based on the latest information, and in the best interest of consumers.’ⁱ*

The RIIO-T1 NOMs policy which Ofgem set out was that it *‘expect[ed] TOs to make asset management decisions which are based on the latest information, and in the best interest of consumers’* and would *‘encourage any justified variations to the NOMs target overall’ⁱⁱ*. Ofgem confirmed that in all circumstances, recovery of delivery costs would occurⁱⁱⁱ.

We believe the core principle, that remains consistent with the RIIO-T1 policy, should be that if we can demonstrate that we did the right thing in respect of our network reliability obligations and delivered that work efficiently, then customers should fund that investment.

In delivering an outturn secondary deliverable measure 4.53% better than our Absolute target, 21% better than the funded improvement, we have incurred £99.3m (£72.9m 09/10 prices) of additional Totex. We are seeking recovery of that sum through the mechanisms provided for in the RIIO-T1 settlement. The evidence provided in this submission (see supporting Engineering Justification Papers) demonstrates the driver for intervention during RIIO-T1. Customers have therefore benefited from the reliability that this investment has brought and therefore should fund that incremental expenditure.

Additional information requests

Over the recent months, during the process development a number of additional steps, not in the NOMs Close Out methodology, have been added by Ofgem. We have addressed these within this submission.

- Section 3 and Appendices A and B of this submission provide that additional information.
- OHL fittings (Appendix A): We demonstrate clear evidence, which supports our existing position, that OHL Fittings were not included within our original T1 Business Plan.
- Deadband methodology (Appendix B): We outline and justify our proposal that a dead-band of $\pm 0.7\%$ against our absolute target is appropriate for our specific Transmission network. This is justified by identifying the original policy intent of Ofgem, identifying the pitfalls where a deadband is set by reference to Absolute measures of remaining risk and benchmark against equivalent targets set for relative measures in Transmission and Distribution networks.

Clarity in progress through Stage 5

This paper, and the associated suite of supporting documents, provides Ofgem with the information needed to assess our RIIO-T1 Close Out stage 5 submission. It confirms that we have materially over delivered on our funded RIIO-T1 targets.

We believe the next steps in this assessment process are clear.

- Ofgem can use a correctly calibrated deadband to control what levels of performance are taken forward for a review of justified delivery. We have shown that performance of $\pm 0.7\%$ of our Absolute risk achieves that.
- Ofgem is then able to review, and will find evidence of and justification for, our delivered activity. It will be able to conclude that our investment decisions have been driven by the right response to the need of our network and customers, that corresponding investment did occur and therefore that allowances should be recovered.
- It can then determine whether the over delivery warrants an additional incentive reward and can choose to confirm that or not.

We do not believe that it is a valid outcome for Ofgem to conclude the work was required but that consumers should not pay for it.

We remain ready to support Ofgem in this review process and are able to provide any further clarification required to allow it to conclude assessment of our Stage 5 submission.

1 Background & Context: T1 and Close Out

1.1 Non-Load RIIO-T1 Settlement

RIIO-T1 Licence

Network Companies were funded to deliver the Non-Load Outputs specified in their RIIO-T1 Business Plans. The Outputs were defined into licence by taking the volumes of assets in each lead asset category and forecasting which Replacement Priority these assets would be in at the end of the RIIO-T1 price control when undertaking the asset interventions outlined in the Business Plan. This created Table 1, “Network Replacement Outputs” specified in Special Licence Condition 2M which we had to deliver over the course of the RIIO-T1 price control. In addition, the licence specified that a licensee shall also be deemed to have delivered its outputs if by the end of the Price Control Period they can demonstrate:

- a materially equivalent output;
- a justified material over-delivery; or
- a justified material under-delivery.

Ofgem’s assessment of a licensee’s delivery would take into account any trade-offs between asset categories which the licensee is able to demonstrate has or is likely to deliver an equivalent or better set of Network Replacement Outputs to those specified in Table 1 of this condition.

If the licensee is determined to have under or over-deliver against its Network Replacement Output targets then Ofgem specified the following treatment:

Incentives	Justified	Unjustified
Material over-delivery	<p>Cost of over-delivery shall be included in the second price control period allowances</p> <p>The financing cost incurred by the licensee in advancing investment shall be reimbursed</p> <p>Reward of 2.5 per cent of the additional costs associated with the material over-delivery</p>	<p>Cost of over-delivery shall be included in the second price control period allowances</p> <p>The licensee shall incur the financing cost of earlier investment</p>
Material Under-delivery	<p>Cost of under-delivery shall be excluded from the second price control period allowances</p> <p>The licensee shall benefit from the financing cost of delayed investment</p>	<p>Cost of under-delivery shall be excluded from the second price control period allowances</p> <p>The benefit arising to the licensee from the financing cost of delayed investment shall be clawed back</p> <p>Penalty of 2.5 per cent of the avoided costs associated with the material under-delivery</p>

This table highlights a fundamental point - that if TOs have over-delivered, and we have, we do not have to justify that over-delivery to recover the costs. Rather, we only have to justify it if we are seeking a reward. Nonetheless, we have provided in this submission significant evidence in the form of Engineering Justification Packs (EJPs) to justify our interventions during RIIO-T1 which should leave Ofgem in a clear position to now include the spent allowances for such interventions in the RIIO-T2 allowances.

RIIO-T1 Final Determinations

The RIIO-T1 framework set a NOMs output which was an Absolute target, as opposed to a Relative target set for DNOs, with Ofgem's rationale for the difference being that TOs had much better data on the health of their assets compared to the DNOs. In setting the NOMs target for TOs, Ofgem provided the following clarity in the RIIO-T1 Final Proposals on how it would treat and assess NOMs delivery vs target:

- The TOs were obliged to meet these targets, or an equivalent, taking into account trade-offs, and it was always acknowledged that a rebasing exercise would be required in order to create some form of output which would allow Ofgem to assess trade-offs across asset categories.
- Ofgem acknowledged that asset management decisions should be made **based on the latest information and be in the best interest of consumers**. Ofgem stated that TOs could trade-off across asset categories in order to deliver an equivalent or better outcome to the NOMs target and that these trade-offs would not be limited.
- Ofgem also stated it would be for the TOs to justify why they needed to over-deliver in one asset category and under-deliver in another.
- In relation to a deadband for T1, Ofgem stated that it was not proposing to set out a mechanistic dead-band around the NOMs targets and that it will ask TOs to provide evidence to justify their achievement of the NOMs target when we compare the outturn NOMs against the targets.

This was the NOMs framework which TOs were set to deliver against over the eight years of the RIIO-T1 price control period. No further policy on NOMs was developed until December 2018 (Year 6 of an 8-year price control), when the first version of the NOMs Incentive Methodology was introduced.

1.2 RIIO-1 T1 Close Out Framework

Ofgem first introduced a version of the NOMs Incentive Methodology in Year 6 of the 8-year price control. At this point there remained fundamental issues such as the size of any materiality threshold (deadband) and a methodology for determining associated costs of over or under-delivery which remained undefined.

In 2020, the Electricity Transmission sector undertook a rebasing exercise to translate its volume-based targets in SpC 2M of the licence into rebased Monetised Risk targets. This process was concluded in December 2020 (Year 7 of the 8-year control). Therefore, TOs had no opportunity to influence plans in order to undertake trade-offs which could deliver a better output for less cost, and monetised risk was introduced solely for the purpose of Ofgem undertaking its assessment of asset trade-offs across different asset categories.

The final version of the NOMs Incentive Methodology was introduced on the 18 June 2021, after the RIIO-T1 price control ended. At this stage, Ofgem had still not determined on fundamental decisions of the NOMs Close Out process, which includes:

- *Use of a materiality threshold (deadband) around target performance:* Ofgem notified Network Companies of the materiality threshold that it intended to apply to its delivery by the 16 September 2021 after the companies had submitted its Delivery position for RIIO-T1 on 31 July 2021. It is not only unacceptable for the deadband to be set retrospectively after network companies have submitted their final NOMs outturn position and having no opportunity to revise their plans and interventions, but the level set is prejudicial to SSEN Transmission, not aligned with deadbands set for other sectors in RIIO-1 or in line with the precedent set in other price controls, such as DPCR5 and RIIO-T2.
- *Calculation of costs associated with over-delivery and under-delivery:* Ofgem decided not to set a methodology for deriving the costs associated with over and under-delivery. Instead, it requested the network companies to propose a methodology as part of its stage 1 and 2 submissions on 31 July 2021.

Bearing in mind that the first version of the NOMs Incentive Methodology was only introduced in Year 6 of an 8 Year price control, Ofgem then introduced the sort of justification it was expecting to receive from network companies for any Stage 5 submission (Justification of over/under-delivery). This included information such as Cost Benefit Analysis (CBA) on an intervention lifetime basis; information and tools which were never indicated had to be used in RIIO-T1 and were only developed for RIIO-2 purposes.

Ofgem went further on the 30 November 2021 by developing a CBA template which should be used by SSEN Transmission to justify its interventions. This CBA template is a modified version of the RIIO-2 Business Plan Data Tables CBA template. This document did not exist in RIIO-T1; it was not used in any decision making during RIIO-T1. It is inappropriate, after the event, to be expected TOs to provide justifications in this new format for interventions we made in the past. It is inappropriate for Ofgem to suggest that Network Companies should retrospectively apply RIIO-T2 CBA to determine whether the interventions it has already undertaken were the correct interventions to undertake. In addition, Monetised Risk was not established in RIIO-T1 until Year 7 of the price control, at which point all asset interventions had either already been completed or were programmed to be completed prior to the end of the price control.

Therefore, we have provided the information which we used to determine what the right intervention was for each project undertaken. In all circumstances this includes the optioneering considered and in many cases, there was only one suitable solution for the asset interventions required.

Following, the publication of the Final Version of the NOMs Incentive Methodology, Ofgem then informed SSEN Transmission on the 3 December (two days after a Stage 5 submission was meant to be submitted under the NOMs Incentive methodology) via email of two additional steps to the Close Out process which is not set out in any formal Close Out methodology. These additional Steps include:

- *Step 1 - Determine Fittings Valuation Treatment:* to determine whether Ofgem should change its view that OHL Fittings should be valued at zero. If evidence is not sufficient to change its view then Ofgem stated the assessment process will end at Step 1.

- *Step 2 - Review Deadband Case:* Ofgem will then review the deadband case contained in our Step 2 Appendix, as well as any relevant supporting data. Ofgem's current view was that the threshold deadband value for progression to Step 3 (i.e. Stage 5 submission) would be 4.5% of our absolute target.

We have provided the information which Ofgem has requested, however we disagree with Ofgem's approach of adding further stages to the NOMs Incentive Methodology in such an informal manner and only applying this process to SSEN Transmission. It is fundamental that Ofgem assesses our full Stage 5 submission and provides a clear conclusion on its assessment of all the evidence and justification which we have provided. These two steps include the determination of OHL Fittings Valuation Treatment and a review of the Deadband Case. We have provided this information in Sections 3.1 and 3.2 of this paper and appendices A and B.

2 Background & Context: RIIO-T1 Asset Management Strategy

Ofgem requested that we “provide the rationale for the high-level strategic asset management decision to materially over/under-deliver including a high-level CBA/lifetime costing, where appropriate, to justify that this is an efficient outcome/delivers better value to consumers.”

We did not drive our asset management strategy in RIIO-T1 in order to over or under deliver on the T1 NOMs targets (not least because as noted in Section 1 it was not possible as it was not yet developed). Rather, our approach was based primarily on replacing or refurbishing assets that were at or approaching end of life, or had serious operational issues, to deliver a safe and secure network for our consumers. As asset management data improved throughout the period, we intervened where necessary and did not where it was not required. This ensured overall efficiency and value for consumers.

The detail of the decision-making process is contained within the Engineering Justification Papers (EJPs) accompanying this submission. This was guided by sound asset management principles and competencies, which are set out in this section below. We also set out how we applied these within our T1 decision making (section 2.2), which ultimately resulted in significantly lower risk across our network with the interventions we took (section 2.3).

2.1 Asset Management Principles and Competence

2.1.1 Principles

Throughout the RIIO-T1 period our business has operated under 2 key guiding principles:

“Deliver the Safe & Secure Network our Customers & Stakeholders expect from us”

and

“to enable the transition to the low carbon economy”

These principles were developed through consultation with our key stakeholder groups and aligned with our developing SSE Group ambitions to be a leader in low carbon energy.

They were subject to further detailed stakeholder consultation during the development of our RIIO-T2 Business Plan and remain at the heart of what we plan to do over the coming years to deliver a Network for Net-Zero.

2.1.2 Competence

The RIIO-T1 period was one of significant growth for the transmission network in the North of Scotland, driven in part by the increase in low carbon generation in our region.

This network growth was mirrored within our own business and over the 8 year period of T1, we saw the development of SSEN Transmission into a key business within the SSE Group of companies and a major player in the UK’s transition to a low-carbon economy.

During this period, we recognised that we had an increasing responsibility to demonstrate to all our key stakeholders that we were competent asset managers and stewards of the transmission network in the North of Scotland.

Early in the RIIO-T1 period, we embarked on a journey to demonstrate our growing competence as Asset Managers by achieving certification to the ISO55001 Asset Management Standard. This certification was awarded to us in January 2015 and we have successfully maintained our re-certification to this standard in 2018 and 2021 (see Figure 2.1).

We are also committed to the continuous improvement of our asset management competence and have been benchmarking our performance against other electricity TOs through the International Transmission Asset Management Study (ITAMS) group since 2018. Our most recent participation in the 2020 ITAMS cycle demonstrated that we have maintained our level of competence throughout the T1 period at the level required to demonstrate competence to the ISO55001 standard.

Our longer-term goal is to demonstrate ‘world-class’ asset management performance by 2026 and we will continue to track our progress towards this goal during the T2 period.

2.2 Applying our Asset Management Strategy

2.2.1 RIIO-T1 Asset Management Strategy

As a responsible Network Operator and Asset Manager, we continually monitor the condition and performance of our assets to ensure we operate the safe and secure network expected by our customers and stakeholders.

This process was the key driver in our approach to the development of our RIIO-T1 Asset Management Strategy as all of our RIIO-T1 intervention decision-making was made on the basis of the asset condition at the time the intervention was planned to be delivered, illustrated in Figure 2.1 below.

This strategy was applied to the development of our T1 Business Plan and the subsequent portfolio of projects presented to Ofgem as part of the final determination process.

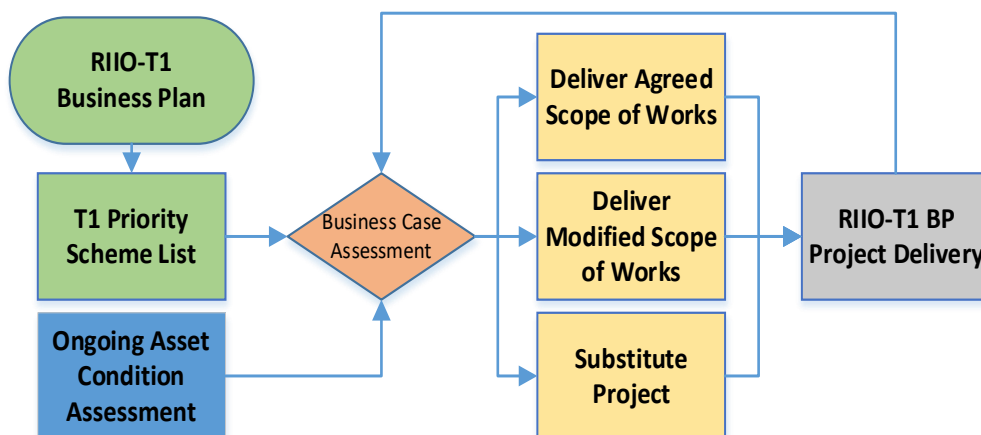


Figure 2.1: RIIO-T1 Intervention Decision-Making Process Flow

2.2.2 Applying the Asset Management Strategy in RIIO-T1

As stated above, asset condition was the primary driver for our intervention decision-making during the RIIO-T1 period and Fig 2.1, above, illustrates how we applied this to the delivery of our T1 outputs.

- i. Where the condition of the assets in the original T1 plan were reassessed and it was clear that the assets would reach 'end of life' during the T1 period, the project was delivered as per the original plan.
- ii. The converse was applied where reassessment of the asset condition determined that the asset was not likely to reach end of life during the T1 period and the project was removed from the plan.
- iii. Where the condition of the assets was reassessed and it could be determined that there had been a change (better or worse) in condition - we considered appropriate modifications to the scope of works to ensure the asset remained in good condition. This can be illustrated by the changes we made to a number of OHL projects during the T1 period, where conductor replacement schemes were extended to include fittings and tower interventions, where the condition indicated that those assets would reach end of life during T1.
- iv. Where assets, not in the original T1 plan, demonstrated earlier than expected deterioration that required urgent attention or was likely to result in their reaching end of life during T1, the appropriate intervention on these assets was substituted into the plan.

The application of this asset management strategy, across our T1 portfolio of works, is detailed on a project by project basis, later in this document.

2.2.3 Evolution of our Asset Management Strategy during the RIIO-T1 Period

While the primary driver of our Asset Management strategy remains the condition of the asset, the development of a common NOMS methodology in 2018, introduced monetised risk as a key metric in asset intervention decision-making.

The Common NOMS Methodology V18 and associated documents, published in 2018, introduced Monetised Risk as a common metric to measure the impact all asset interventions and act as an enabler for the trading of risk across asset categories.

While this methodology has a common base across all three UK TOs, the monetary component of this methodology (embedded within the System Consequence calculation) does not work well on networks with single radial feeders to demand and load Customers, like ours. The result of this methodology is that a relatively small amount of our assets represent the bulk of the overall Monetised Risk for our network.

This can result in relatively small amounts of investment delivering very large, monetised risk performance and vice versa.

It is important to note that all of our RIIO-T1 asset intervention decisions had been made prior to the conclusion of the 2018 NOMS rebasing exercise, so this had no material impact on what was delivered during the T1 period.

2.3 RIIO-T1 Asset Management Performance

In this section, we summarise our performance against our key metrics from the RIIO-T1 period; the benefits delivered to the Consumer; and the appropriate financial outcomes that reflect our performance in delivering these benefits to consumers over the regulatory period.

2.3.1 Key RIIO-T1 Metrics

Our performance across the RIIO-T1 period is summarised in table 2.1, below.

Category (All Voltages)	Volume Target	Volume Delivered	Network Risk Target (R£M)	Network Risk Delivered (R£M)	Cost Allowance (£M)	Cost Delivered (£M)
Transformers	16	16	69.6	57.4	64.5	
Circuit Breakers	29	26	168.2	180.2	19.3	
Reactors	0	10	9.2	2.5	0	
Cables (km)	14.72	15.3	17.3	17.3	12.2	
OHL Conductor (km)	927.3	564	170.5	161.2	118.1	
OHL Fittings (km)	122.4	913.0	231.0	134.7	0	
OHL Towers	0	385	532.5	543.7	0	
TOTALS	-	-	1,198.3	1,097.0	214.2	313.5

Table 2.1: RIIO-T1 Performance Summary

Some of the key points to note from table 2.1 above are:

- We over-delivered against our original T1 volumes targets in 4 of the 7 lead asset classes (Reactors, Cables, OHL Fittings & OHL Towers)
- Transformers delivery met the original T1 volumes target
- Marginal under-delivery (by 3) against the Circuit Breaker T1 volumes target
- Under-delivery against the OHL Conductor T1 volumes target.

This represents a material over-delivery at a portfolio level in terms of volumes and replicated in our Network Risk reductions.

2.3.2 RIIO-T1 Network Investment

We presented a Business Plan for the RIIO-T1 period that comprised a series of projects to refurbish/replace assets that we believed, at that time, would reach their end of life during the T1 period. This proposal to invest £214.2 million, over the 8-year period, received approval in the final determinations made by Ofgem.

As outlined in section 2.2 above, our Asset Management strategy for the T1 period was to continually monitor the condition and performance of our assets to ensure that we only intervened where it was clear that the asset would reach its end of life before 2021 and could provide justification that the intervention was necessary to maintain the safe & secure network expected from us by our Customers and Stakeholders.

Section 4 of this document summarises the essential intervention decisions we took, across the T1 period, to maintain network performance and reliability to our Customers & Stakeholders.

This paper is supplemented by a portfolio of Engineering Justification Papers (EJPs) that provide our Close Out summary of the works undertaken, the rationale behind each and the solution delivered. Where projects have been deferred, the papers provide details of the reason why.

Our total Non-Load intervention investment across RIIO-T1 was £313.5 million. This represents an investment to maintain the integrity and reliability of our Network of £99.3 million above the original RIIO-T1 funding allowance.

We believe that this paper and supporting documents will demonstrate to Ofgem that all interventions delivered by us during the T1 period were justified; that they were essential to maintain a safe & reliable transmission network; and that they were delivered safely and in a cost efficient manner.

The outcome we are seeking from this process is that Ofgem recognise that these interventions were justified and should be funded by Customers, with a resulting funding adjustment of £99.3 million made to our RIIO-T1 allowances.

2.3.3 Network Risk Performance

Our Network Risk Performance across the T1 period is summarised in Figure 2.2.

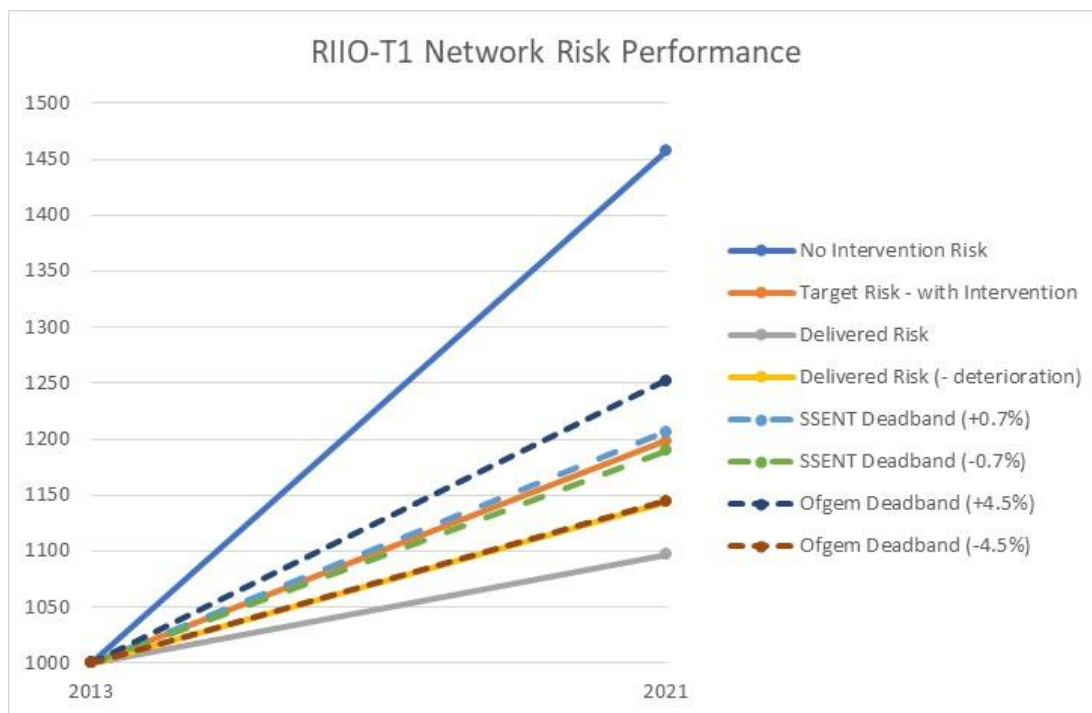


Figure 2.2: SSEN Network Risk Performance

From the NOMS rebasing exercise in 2018, our no intervention target for the T1 period was R£1,457.2 million, with an Absolute Target (with intervention) of R£1,198.3 million – representing an overall reduction in network risk of R£258.9 million.

Section 4 of this paper, supplemented by a portfolio of EJPs and the T1 Close Out data tables, demonstrates that we have delivered a network risk of R£1,097 million – representing an overall reduction in network risk of R£360.2 million across the T1 period and an overperformance of R£101.3 million from our absolute target.

With the removal of factors associated with faster/slower deterioration (R£47 million), this still represents an out performance of R£54.3 million (or 4.53%) against our absolute target of R£1,198.3 million.

3 Our Justification for a Stage 5 Submission

In an email received on 3 December 2021, Ofgem outlined a 3-step process (illustrated in Figure 3.1 below) to be used for the assessment of our RIIO-T1 Close Out Stage 5 submission.

This section of our paper summarises the information, evidence and supporting data we have gathered to demonstrate why the ‘non-zero valuation’ of our fittings over-delivery is justified; and why it is both appropriate and fair to apply a dead-band range of 0.7% against our absolute T1 NOMS targets.

Our full detailed submissions for Steps 1 and 2 can be found in Appendices A and B.

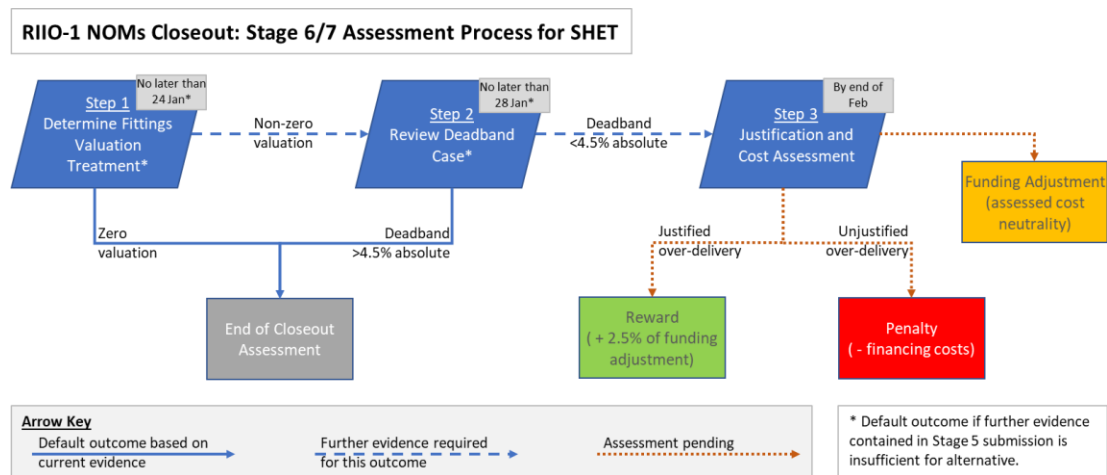


Fig 3.1: Ofgem RIIO-1 NOMs Closeout: Stage 6/7 Assessment Process for SHET

3.1 Step 1: Determine Fittings Valuation Treatment

Our RIIO-T1 business plan identified our intent to replace 927.3km of OHL phase conductors across 19 separate reconductoring schemes.

Ofgem’s assessment of our initial T1 Close Out submission data has concluded that the replacement of all associated OHL fittings were included in this volume target, stating that it “would be unusual (if not unknown) for conductor replacement to not include replacement of the associated fittings, and it is therefore difficult to understand under what circumstances an ETO would submit a business plan without including the costs of associated fittings in its reconductoring work.”

From our ongoing assessment of our T1 Business Plan submission, we believe that this assessment is incorrect and that the 913.2km of fittings delivered by us in the T1 period should be predominantly considered ‘over delivery’ against our targets and receive a non-zero valuation by Ofgem.

A review of our RIIO-T1 suite of documents identified the series of Supplementary Questions (SQs) raised by Ofgem at the time of the T1 business plan reviews; answered by SSEN Transmission during the business plan determination period.

Detailed within Appendix A of this submission, we clear evidence that fittings were specifically not included within our T1 submission for the 927.3km of conductor replacement works, with the exception of 3 named schemes, totalling 122.4km.

This is further supported by the Transmission OHL Refurbishment Priority Assessment spreadsheet that was submitted as a supporting document for our T1 Business Plan. This spreadsheet clearly shows that our understanding at this time was that the vast majority of our OHL fittings were in good condition and did not require intervention during the RIIO-T1 period. The exceptions to this were the 3 schemes named in SQ RT1-Ph2-12.

3.2 Step 2: Review Deadband Case

In the RIIO-T1 framework, Ofgem set a NOMs output that was an absolute target, as opposed to the relative target applied across other regulated energy sectors.

In setting this target, Ofgem also provided clarity on how NOMs delivery versus target would be treated during the T1 Close Out process. The final proposal from Ofgem included a statement that there would be no mechanistic deadband around the NOMs target.

The current position is that Ofgem has actually applied a large deadband against the absolute target. This deadband has no direct relationship to the works which the company was funded to deliver, creating a huge threshold, in which a company can deliver a materially equivalent delivery.

This means it is very easy for a company to deliver a materially equivalent delivery, but extremely difficult to get into an over or under delivery position.

It is then preventing companies with a significant over-delivery from progressing to Stage 5 in order provide evidence to justify their achievement of the NOMs target.

Appendix B of this submission provides Ofgem with our analysis of Ofgem's proposed deadband approach; demonstrates how this delivers an inconsistent result when applied across all 3 TOs, with the most significant impact being on SSEN Transmission; and our proposal for a 0.7% deadband to be applied to our absolute target. Overall, this is an approach that we believe is both fair for the consumer and SSEN Transmission and is firmly within the principles Ofgem has outlined for this process.

4 Step 3: Justification & Cost Assessment

In this section, SSEN Transmission provides the details needed to demonstrate our RIIO-T1 Close Out position to Ofgem is one of 'justified over delivery'. Although we note that the requirement for "justified" over-delivery (versus unjustified over-delivery) is only required for a reward and not for recovery of allowances as per the RIIO-T1 licence and as noted in Section 1.1. above.

Nonetheless in our role of a responsible Asset Manager and Steward of the Transmission Network in the North of Scotland, we welcome a review of our decisions making to provide Ofgem and consumers confidence in allowing us to recover the costs associated with the additional investments made and the associated network risk reductions delivered on our network during the T1 period.

The narrative, analysis and data contained within this section is supported by our fully populated Ofgem RIIO-T1 NOMS close-out data template spreadsheet that accompanies this submission. All data used in this paper is extracted from the relevant tab within the spreadsheet.

We have also prepared a suite of EJPs which outline our asset intervention decision-making across the T1 period.

Where a project formed part of our original T1 business plan submission and was delivered to plan, during the T1 period, no additional EJP submission is being made.

EJPs have been prepared for any project that was in the original business plan that was subsequently deferred to a future regulatory period; or delivered with a significant change in scope. An EJP has also been prepared for all projects substituted into the T1 plan, post final determination.

A list of the EJPs that accompany this submission is contained in Appendix C of this document.

4.1 RIIO-T1 Business Plan Targets & Allowances

SSEN Transmission's RIIO-T1 Post Normalised Business Plan targets and allowances are outlined in table 4.1-1 below.

All cost values in this paper have a 2020/21 base, as per the Ofgem NOMS RIIO1 Close Out data tables.

Asset Category (All Voltages)	Target Risk – No Intervention (R£M) ^{iv}	Target Risk – With Intervention (R£M) ^v	Volume Target ^{vi}	Cost Allowance (£M) ^{vii}
Circuit Breakers	192.1	148.2	29	19.3
Transformers	74.4	69.6	16	64.5
Reactors	8.4	9.2	0	0
Underground Cable	33.0	17.3	14.7km	12.1
OHL Conductor	272.1	178.9	927.3km	118.1
OHL Fittings	286.7	242.6	122.4km	0.0
OHL Towers	590.3	557.4	0	0.0
TOTAL	1457.2	1223.1	-	214.2

Table 4.1.1 SSEN Transmission RIIO-T1 Targets & Allowances

Following the NOMS rebasing exercise in 2018, the SSEN Transmission RIIO-T1 Business Plan target was represented by a portfolio of asset interventions that would deliver a Post Normalised Network Risk score of **R£1,223.1M** (a net reduction of **R£234.1M** from the no-intervention target of **R£1,457.2M**) against an allowance of **£214.2M**.

4.2 RIIO-T1 Transformer Asset Portfolio & Performance

This section looks at each Transformer project within the SSEN Transmission RIIO-T1 portfolio, providing a summary of the asset intervention decision-making taken during the T1 period and a measure of the impact of each project on the overall performance of SSEN Transmission against our RIIO-T1 targets.

Table 4.1-1 defines the key targets for T1 Transformer performance to be:

- Post Normalised Target Asset Risk reduction (with intervention) to be R£4.8M
- Volume Target to be 16
- T1 cost allowance to be £64.6M.

Each table in the section below will show the contribution each project makes towards the achievement of these targets.

Where a project has a supporting EJP, this is referenced as a footnote in the title of each project.

4.2.1 RIIO-T1 Transformer Performance Summary

As would be expected when managing a transmission network across an 8-year Regulatory period, there were a number of changes made to the original T1 plan across the Transformers portfolio, based on asset condition and other contributing factors.

Table 4.2-1 summarises our performance across Volumes, Network Risk and Cost.

	Target	Delivered	Delta
Transformer Volume	16	16	0
Network Risk at end of T1 period (R£M)	69.6	57.4	-12.2
T1 Cost Allowance (£M)	64.5		

Table 4.2-1: Summary of T1 performance - Transformers

The above figures show that, in this asset category, we met the original T1 volumes targets.

It is also clear that the assets we substituted into the plan delivered a greater network risk reduction than the original T1 target, reflecting their higher criticality on the network.

While this is a positive result, our intervention decision-making was based on asset condition as monetised risk was only introduced at the end of the price control period.

The other significant point to note is that these interventions were delivered significantly under the T1 allowance budgets.

4.2.2 SH-00145: Burghmuir Transformer Replacement

This project formed part of the original T1 BP and was delivered during the period, as planned.

	Target	Delivered
Transformer Volume	2	2
Network Risk (R£M)	3.2	2.6
T1 Cost Allowance (£M)	6.82	

Table 4.2-2: SH-00145 Impact on T1 performance

4.2.3 SH-00146: Dudhope Transformer Replacement^{viii}

This project formed part of the original T1 BP but our ongoing condition assessment determined that the assets would not reach end of life during T1, so no works were deemed necessary during the T1 period.

Intervention on these assets will be considered as part of the Dundee Whole System Strategy for the RIIO-T3 period, under a pre-construction funding allowance for the T2 period.

	Target	Delivered
Transformer Volume	2	0
Network Risk (R£M)	1.1	0
T1 Cost Allowance (£M)	7.50	

Table 4.2-3: SH-00146 Impact on T1 performance

4.2.4 SH-00147: Dunvegan Transformer Replacement

This project formed part of the original T1 BP and was delivered during the period, as planned.

	Target	Delivered
Transformer Volume	1	1
Network Risk (R£M)	2.47	2.13
T1 Cost Allowance (£M)	3.95	

Table 4.2-4: SH-00147 Impact on T1 performance

4.2.5 SH-00148: Dyce Transformer Replacement

This project formed part of the original T1 BP and was delivered during the period, as planned.

	Target	Delivered
Transformer Volume	2	2
Network Risk (R£M)	1.2	0.8
T1 Cost Allowance (£M)	8.18	

Table 4.2-5: SH-00148 Impact on T1 performance

4.2.6 SH-00149: Lochay Transformer Replacement^{ix}

This project formed part of the original T1 BP and is being delivered as a 'Covid-delayed' scheme in the T2 period.

	Target	Delivered
Transformer Volume	2	2
Network Risk (R£M)	0.5	0.9
T1 Cost Allowance (£M)	8.23	

Table 4.2-6: SH-00149 Impact on T1 performance

4.2.7 SH-00150: Milton of Craigie Transformer Replacement^x

This project formed part of the original T1 BP but our ongoing condition assessment determined that the assets would not reach end of life during T1, so no works were deemed necessary during the T1 period.

Intervention on these assets will be considered as part of the Dundee Whole System Strategy for the RIIO-T3 period, under a pre-construction funding allowance for the T2 period.

	Target	Delivered
Transformer Volume	2	0
Network Risk (R£M)	0.8	0
T1 Cost Allowance (£M)	8.18	

Table 4.2-7: SH-00150 Impact on T1 performance

4.2.8 SH-00151: Nant Transformer Replacement^{xi}

This project formed part of the original T1 BP but the Transformer failed in service prior to the planned intervention and was substituted by the project below – SH-00563 Nant Emergency Transformer Replacement.

	Target	Delivered
Transformer Volume	1	0
Network Risk (R£M)	1.2	0
T1 Cost Allowance (£M)	3.41	

Table 4.2-8: SH-00151 Impact on T1 performance

4.2.9 SH-00563: Nant Emergency Transformer Replacement^{xii}

This project did not form part of the original T1 BP. However, there was an unexpected disruptive failure of this asset that required immediate replacement during the T1 period.

	Target	Delivered
Transformer Volume	0	1
Network Risk (R£M)	0	1.0
T1 Cost Allowance (£M)	0	

Table 4.2-9: SH-00563 Impact on T1 performance

4.2.10 SH-00152: Sloy PS & GSP Transformer Replacement^{xiii}

This project formed part of the original T1 BP but our ongoing condition assessment determined that the assets would not reach end of life during T1, so no works were deemed necessary during the T1 period.

There is a T2 project that is delivering an asset replacement intervention on these and other assets at Sloy PS & GSP.

	Target	Delivered
Transformer Volume	2	0
Network Risk (R£M)	0.04	0
T1 Cost Allowance (£M)	8.18	

Table 4.2-10: SH-00152 Impact on T1 performance

4.2.11 SH-00153: Willowdale Transformer Replacement^{xiv}

This project formed part of the original T1 BP but our ongoing condition assessment determined that the assets would not reach end of life during T1, so no works were deemed necessary during the T1 period.

There is a T2 project that is delivering an asset replacement intervention on these and other assets at Willowdale GSP.

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	Target	Delivered
Transformer Volume	2	0
Network Risk (R£M)	0.8	0
T1 Cost Allowance (£M)	8.18	

Table 4.2-11: SH-00153 Impact on T1 performance

4.2.12 SH-00426: Ardmore Transformer Replacement^{xv}

This project did not form part of the original T1 BP, but following further condition assessment, it was determined that the asset would reach end of life during the T1 period, with replacement the only viable option.

	Target	Delivered
Transformer Volume	0	1
Network Risk (R£M)	0	7.9
T1 Cost Allowance (£M)	0	

Table 4.2-12: SH-00426 Impact on T1 performance

4.2.13 SH-00435: St Fergus Gas – Transformer Replacement^{xvi}

This project did not form part of the original T1 BP, but following further condition assessment, it was determined that the assets would reach end of life during the T1 period, with replacement the only viable option. This project is being delivered as a 'Covid-delayed' scheme in the first year of the T2 period.

	Target	Delivered
Transformer Volume	0	2
Network Risk (R£M)	0	1.2
T1 Cost Allowance (£M)	0	

Table 4.2-13: SH-00435 Impact on T1 performance

4.2.14 SH-00507: Stornoway Transformer Replacement^{xvii}

This project did not form part of the original T1 BP, but following further condition assessment, it was determined that the asset would reach end of life during the T1 period, with replacement the only viable option.

	Target	Delivered
Transformer Volume	0	1
Network Risk (R£M)	0	0.3
T1 Cost Allowance (£M)	0	

Table 4.2-14: SH-00507 Impact on T1 performance

4.2.15 SH-00433: Brora Transformer Replacement^{xviii}

This project did not form part of the original T1 BP, but following further condition assessment, it was determined that the asset would reach end of life during the T1 period, with replacement the only viable option.

	Target	Delivered
Transformer Volume	0	1
Network Risk (R£M)	0	3.7
T1 Cost Allowance (£M)	0	

Table 4.2-15: SH-00433 Impact on T1 performance

4.2.16 SH-00425: Harris Transformer Replacement^{xix}

This project did not form part of the original T1 BP, but following further condition assessment, it was determined that the asset would reach end of life during the T1 period, with replacement the only viable option.

	Target	Delivered
Transformer Volume	0	1
Network Risk (R£M)	0	1.2
T1 Cost Allowance (£M)	0	

Table 4.2-16: SH-00425 Impact on T1 performance

4.2.17 SH-00432: Tealing SGT Replacement^{xx}

This project did not form part of the original T1 BP, but following further condition assessment, it was determined that the asset would reach end of life during the T1 period, with replacement the only viable option.

	Target	Delivered
Transformer Volume	0	1
Network Risk (R£M)	0	1.6
T1 Cost Allowance (£M)	0	

Table 4.2-17: SH-00432 Impact on T1 performance

4.2.18 SH-00651: Lunanhead Transformer Replacement^{xxi}

This project did not form part of the original T1 BP. There was an unexpected disruptive failure of this asset that required immediate replacement during the T1 period.

	Target	Delivered
Transformer Volume	0	1
Network Risk (R£M)	0	0.0
T1 Cost Allowance (£M)	0	

Table 4.2-18: SH-00651 Impact on T1 performance

4.3 RIIO-T1 Circuit Breaker Asset Portfolio & Performance

This section looks at each Circuit Breaker project within the SSEN Transmission RIIO-T1 portfolio, providing a summary of the asset intervention decision-making taken during the T1 period and a measure of the impact of each project on the overall performance of SSEN Transmission against our RIIO-T1 targets, defined in section 5.3.

Table 4.1-1 defines the key targets for T1 Circuit Breaker performance to be:

- Target Asset Risk reduction (with intervention) to be R£43.9M
- Volume Target to be 29
- T1 cost allowance to be £19.3M

Each table in the section below will show the contribution each project makes towards the achievement of these targets.

Where a project has a supporting EJP, this is referenced as a footnote in the title of each project.

4.3.1 RIIO-T1 Circuit Breaker Performance Summary

As would be expected when managing a transmission network across an 8-year Regulatory period, there were a number of changes made to the original T1 plan across the Circuit Breaker portfolio, based on asset condition and other contributing factors.

Table 4.3-1 summarises our performance across Volumes, Network Risk and Cost.

	Target	Delivered	Delta
Circuit Breaker Volume	29	26	-3
Network Risk at end of T1 period (£M)	148.2	160.1	11.9
T1 Cost Allowance (£M)	19.3		

Table 4.3-1: Summary of T1 performance – Circuit Breakers

The above figures show that, in this asset category, the under-delivery in volumes has also resulted in a lower network risk reduction (by £12M) than the original T1 target.

As previously stated, our intervention decision-making, across the circuit breaker portfolio, was based on asset condition only. The network risk contribution of assets substituted into the plan was not a factor considered in our T1 planning.

The other point to note is that the reduced volume of asset interventions were delivered under the T1 allowance budgets.

4.3.2 SH-00154: Foyers 275kV Circuit Breaker Replacement^{xxii}

This project formed part of the original T1 BP, with a target replacement of 1 circuit breaker. Another circuit breaker on site was due to be changed at part of our TPCR4 plan but rolled over into RIIO-T1 and was not in the original RIIO-T1 plan, resulting in a net increase of 1, against the original T1 volumes.

	Target	Delivered
Circuit Breaker Volume	1	2
Network Risk (£M)	1.8	2.6
T1 Cost Allowance (£M)	0.82	

Table 4.3-2: SH-00154 Impact on T1 performance

4.3.3 SH-00155 & SH-00645: Keith 132kV Circuit Breaker Replacement^{xxiii}

This project formed part of the original T1 BP, with a target replacement of 4 circuit breakers. Our ongoing condition assessment determined that the assets would not reach end of life during T1, so no works were deemed necessary during the T1 period. Later in the T1 period, one of the circuit breakers developed a major SF6 leak, requiring immediate replacement. The overall result was a net decrease of 3 against original T1 volumes.

	Target	Delivered
Circuit Breaker Volume	4	1
Network Risk (R£M)	3.1	0.8
T1 Cost Allowance (£M)	2.73	

Table 4.3-3: SH-00155 & SH-00645 Impact on T1 performance

4.3.4 SH-00156: Milton of Craigie 132kV Circuit Breaker Replacement^{xxiv}

This project formed part of the original T1 BP but our ongoing condition assessment determined that the assets would not reach end of life during T1, so no works were deemed necessary during the T1 period.

Intervention on these assets will be considered as part of the Dundee Whole System Strategy for the RIIO-T3 period, under a pre-construction funding allowance for the T2 period.

	Target	Delivered
Circuit Breaker Volume	3	0
Network Risk (R£M)	0.3	0
T1 Cost Allowance (£M)	3.41	

Table 4.3-4: SH-00156 Impact on T1 performance

4.3.5 SH-00157: St Fergus Mobil Circuit Breaker Replacement^{xxv}

This project formed part of the original T1 BP but was deferred to a future regulatory period, due to the significant challenges of obtaining access to this high security facility to undertake works and the need for additional work to move the circuit breakers indoor due to the highly saline environment.

Intervention on these assets was deferred to the RIIO-T2 period.

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	Target	Delivered
Circuit Breaker Volume	2	0
Network Risk (R£M)	6.0	0
T1 Cost Allowance (£M)	1.36	

Table 4.3-5: SH-00157 Impact on T1 performance

4.3.6 SH-00158: Sloy Circuit Breaker Replacement

This project formed part of the original T1 BP and was delivered within the T1 period.

	Target	Delivered
Circuit Breaker Volume	14	14
Network Risk (R£M)	34.6	34.3
T1 Cost Allowance (£M)	11.6	

Table 4.3-6: SH-00158 Impact on T1 performance

4.3.7 SH-00159: Persley Circuit Breaker Replacement^{xxvi}

This project formed part of the original T1 BP but our ongoing condition assessment determined that the assets would not reach end of life during T1, so no works were deemed necessary during the T1 period.

Intervention on these assets will be considered as part of the Aberdeen Whole System Strategy for the RIIO-T3 period, under a pre-construction funding allowance for the T2 period.

	Target	Delivered
Circuit Breaker Volume	3	0
Network Risk (R£M)	2.7	0
T1 Cost Allowance (£M)	1.02	

Table 4.3-7: SH-00159 Impact on T1 performance

4.3.8 SH-00160: Dunbeath Circuit Breaker Replacement

This project formed part of the original T1 BP and was delivered within the T1 period.

	Target	Delivered
Circuit Breaker Volume	2	2
Network Risk (R£M)	3.8	3.8
T1 Cost Allowance (£M)	1.09	

Table 4.3-8: SH-00160 Impact on T1 performance

4.3.9 SH-00504: Keith 275kV Circuit Breaker Replacement^{xxvii}

This project did not form part of the original T1 BP, but following further condition assessment during the T1 period, it was determined that the asset would reach end of life during the T1 period, with replacement the only viable option.

	Target	Delivered
Circuit Breaker Volume	0	1
Network Risk (R£M)	0	0.8
T1 Cost Allowance (£M)	0	

Table 4.3-9: SH-00504 Impact on T1 performance

4.3.10 SH-00412: Brechin Circuit Breaker Replacement^{xxviii}

This project did not form part of the original T1 BP, but following further condition assessment during the T1 period, it was determined that the asset would reach end of life during the T1 period, with replacement the only viable option.

	Target	Delivered
Circuit Breaker Volume	0	1
Network Risk (R£M)	0	0.9
T1 Cost Allowance (£M)	0	

Table 4.3-10: SH-00412 Impact on T1 performance

4.3.11 SH-00411: Abernethy Circuit Breaker Replacement^{xxix}

This project did not form part of the original T1 BP, but following further condition assessment during the T1 period, it was determined that the asset would reach end of life during the T1 period, with replacement the only viable option. The site was also reconfigured with 2 additional circuit breakers, providing increased operational resilience to this part of the network.

	Target	Delivered
Circuit Breaker Volume	0	3
Network Risk (R£M)	0	1.7
T1 Cost Allowance (£M)	0	

Table 4.3-11: SH-00411 Impact on T1 performance

4.3.12 SH-00646: Shin Circuit Breaker Replacement^{xxx}

This project did not form part of the original T1 BP, but following further condition assessment during the T1 period, it was determined that these assets would reach end of life during the T1 period, with replacement the only viable option.

	Target	Delivered
Circuit Breaker Volume	0	2
Network Risk (R£M)	0	1.7
T1 Cost Allowance (£M)	0	

Table 4.3-12: SH-00646 Impact on T1 performance

4.4 RIIO-T1 Reactor Asset Portfolio & Performance

This section looks at each Reactor project within the SEEN Transmission RIIO-T1 portfolio, providing a summary of the asset intervention decision-making taken during the T1 period and a measure of the impact of each project on the overall performance of SEEN Transmission against our RIIO-T1 targets, defined in section 5.3.

Table 4.1-1 defines the key targets for T1 Reactor performance to be:

- Target Asset Risk reduction (with intervention) to be -R£0.8 million, representing a target network risk increase for this asset class
- Volume Target to be 0
- T1 cost allowance to be £0.0 million

Each table in the section below will show the contribution each project makes towards the achievement of these targets. Where a project has a supporting EJP, this is referenced as a footnote in the title of each project.

4.4.1 RIIO-T1 Reactor Performance Summary

There were no Reactors and therefore no volume or financial targets associated with their delivery in our original T1 BP. The justifications for the inclusion of 10 Reactor replacement volumes in the T1 plan is covered above and in the accompanying EJPs.

Table 4.4-1 summarises our performance across Volumes, Network Risk and Cost.

	Target	Delivered	Delta
Reactor Volume	0	10	+10
Network Risk at end of T1 period (R£M)	9.2	2.5	-6.7
T1 Cost Allowance (£M)	0		

Table 4.4-1: Summary of T1 performance - Reactors

The key points to note in this asset category is that there has been a significant improvement in network risk delivered by this work and SEEN Transmission has invested [REDACTED] to deliver R£6.7 million of network risk benefits to Customers – funding that was not in our original BP allowances.

4.4.2 SH-00508, 509, 510 & 511: Tironi Reactor Replacement^{xxxi}

This project did not form part of the original T1 BP. The 9 reactor assets impacted by this suite of projects were all less than 5 years old but manifested significant performance issues and failures that were unable to be rectified by the manufacturer.

Following a period of review, it was determined that these assets needed to be replaced during the RIIO-T1 period as they were unable to perform their critical role in managing network voltage stability. A single EJP has been developed to demonstrate the asset intervention decision-making process across this family of reactors.

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	Target	Delivered
Reactor Volume	0	9
Network Risk (R£M)	0	5.5
T1 Cost Allowance (£M)	0	

Table 4.4-2: SH-00646 Impact on T1 performance

4.4.3 SH-00432: Tealing SGT & Reactor Replacement

This project did not form part of the original T1 BP. Section 3.4.16 identifies that it was necessary to replace a 275kV SGT at Tealing during the T1 period and provides an EJP that identifies the condition-based need to also replace the 275kV Reactor associated with the SGT.

	Target	Delivered
Reactor Volume	0	1
Network Risk (R£M)	0	0.8
T1 Cost Allowance (£M)	0	

Table 4.4-3: SH-00432 Impact on T1 performance

4.5 RIIO-T1 Underground Cable Asset Portfolio & Performance

This section looks at each Underground Cable project within the SSEN Transmission RIIO-T1 portfolio, providing a summary of the asset intervention decision-making taken during the T1 period and a measure of the impact of each project on the overall performance of SSEN Transmission against our RIIO-T1 targets, defined in section 5.3.

Table 7.1-1 defines the key targets for T1 Cable performance to be:

- Target Asset Risk reduction (with intervention) to be R£15.7 million
- Volume Target to be 14.72 km
- T1 cost allowance to be £12.2 million

Each table in the section below will show the contribution each project makes towards the achievement of these targets.

Where a project has a supporting EJP, this is referenced as a footnote in the title of each project.

4.5.1 RIIO-T1 Underground Cable Performance Summary

There were very few changes to the original T1 BP for Cables. The justification for the inclusion of additional cable volumes in the T1 plan is covered above and in the accompanying EJP.

Table 4.5-1 summarises our performance across Volumes, Network Risk and Cost.

	Target	Delivered	Delta
Cables Volumes (km)	14.72	15.3	+0.58
Network Risk at end of T1 period (R£M)	17.3	17.3	0.1
T1 Cost Allowance (£M)	12.2		

Table 4.5-1: Summary of T1 performance – Underground Cables

4.5.2 SH-00197: Clayhills-Willowdale Cable Replacement

This project formed part of the original T1 BP and was delivered within the T1 period.

	Target	Delivered
Cables Volume (km)	4.16	4.16
Network Risk (R£M)	4.6	4.8
T1 Cost Allowance (£M)	7.1	

Table 4.5-2: SH-00197 Impact on T1 performance

4.5.3 SH-00198: Aberdeen City JPE/JPW Cable Replacement

This project formed part of the original T1 BP and was delivered within the T1 period.

	Target	Delivered
Cables Volume (km)	7.36	7.36
Network Risk (R£M)	8.0	8.3
T1 Cost Allowance (£M)	5.5	

Table 4.5-3: SH-00198 Impact on T1 performance

4.5.4 SH-00199: Dundee GDN/GDS Cable Replacement

This project formed part of the original T1 BP and was delivered within the T1 period.

	Target	Delivered
Cables Volume (km)	3.2	3.2
Network Risk (R£M)	3.2	3.3
T1 Cost Allowance (£M)	5.3	

Table 4.5-4: SH-00199 Impact on T1 performance

4.5.5 SH-00522: Sooty Wells Diversion^{xxxii}

This project did not form part of the original T1 BP and was undertaken following an ESQCR review of the safety to the public from the OHL assets in the vicinity. It was determined that the safest solution was to underground a short section of OHL. There was no NOMS output associated with this work.

	Target	Delivered
Cables Volume (km)	0	0.58
Network Risk (R£M)	0	0
T1 Cost Allowance (£M)	0	

Table 4.5-5: SH-00522 Impact on T1 performance

4.7 RIIO-T1 Overhead Line Asset Portfolio & Performance

This section looks at each Overhead Line project within the SSEN Transmission RIIO-T1 portfolio, providing a summary of the asset intervention decision-making taken during the T1 period and a measure of the impact of each project on the overall performance of SSEN Transmission against our RIIO-T1 targets for OHL Conductor, OHL Fittings and OHL Towers, defined in section 5.3.

Table 4.6 defines the key targets for T1 OHL performance to be:

	OHL Conductor	OHL Fittings	OHL Towers
Target Asset Risk reduction (with intervention) – (R£M)	96.4	55.7	3.1
Volume Target	927.3km	122.4km ^{xxxiii}	0
T1 Cost Allowance (£M)	118.1	0	0

Table 4.6: RIIO-T1 OHL Targets

Each table in the section below will show the contribution each project makes towards the achievement of these targets.

Where a project has a supporting EJP, this is referenced as a footnote in the title of each project.

4.7.1 RIIO-T1 Overhead Line Performance Summary

As would be expected when managing a transmission network across an 8-year Regulatory period, there were a number of changes made to the original T1 plan across the OHL portfolio, based on asset condition and other contributing factors.

Table 4.6.1 summarises our performance across Volumes, Network Risk and Cost for all 3 OHL lead asset categories.

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	Target	Delivered	Delta
OHL Conductor Volume (km)	927.3	564.0	-363.3
Network Risk (R£M)	170.5	161.2	+9.3
T1 Cost Allowance (£M)	118.1		
OHL Fittings Volume (km)	122.4	913.0	+790.6
Network Risk (R£M)	231.0	134.7	+96.3
T1 Cost Allowance (£M)	0		
Towers Volume	0	385	+385
Network Risk (R£M)	532.5	543.7	-11.2
T1 Cost Allowance (£M)	0		

Table 4.6-1: Summary of T1 performance – Overhead Lines

Some of the key performance points to note from the above table are as follows:

- We delivered 59% of conductor target volumes at a cost of [REDACTED] of our T1 allowance to over deliver on OHL Conductor network risk targets by R£9.3M

There was an output of 790km of fittings replacement above our T1 BP target, with a resulting improvement in network risk of R£96.3M, at an investment cost of [REDACTED] that was not in our T1 allowances

- 385 new towers were built during the T1 period, at a cost of [REDACTED]. This is a prime example where the network risk position – an increase of R£11.2, (reflecting the contribution to monetised risk of the increased number of tower assets on the network) is out of sync with the real-world work undertaken. The towers on these circuits would have reached their end of life during the T1 period, had SSEN Transmission not intervened. A failure to act as a responsible Asset Manager could have resulted in significant supply issues on these parts of the network and Consumers now benefit from these assets being in good condition for the next 40 years.

4.7.2 SH-00172: Beauly-Deanie OHL Reconductoring^{xxxiv}

This project formed part of the original T1 BP to deliver 26.7km of phase conductor replacement, but was deferred to a future regulatory period, to enable a ‘whole system’ approach to be taken to the 132kV infrastructure on this part of our network.

Intervention on these assets was deferred to the RIIO-T2 period and is now aligned with asset replacement works at 4 Hydro power station sites, connected to this circuit.

	Target	Delivered
OHL Conductor Volume (km)	26.7	0
Network Risk (R£M)	0.09	0
T1 Cost Allowance (£M)	2.86	

Table 4.6-2: SH-00172 Impact on T1 performance

4.7.3 SH-00173: Burghmuir Spur OHL Reconductoring^{xxxv}

This project formed part of the original T1 BP to deliver 7.4km of phase conductor replacement and was delivered during the T1 period. In addition to the original scope, it was determined through additional inspection & assessment that there was a condition-driver to replace the fittings on this OHL.

	Target	Delivered
OHL Conductor Volume (km)	7.4	0
Network Risk (R£M)	0.07	0.05
T1 Cost Allowance (£M)	0.82	
OHL Fittings Volume (km)	0	6.9
Network Risk (R£M)	0	0.08
T1 Cost Allowance (£M)	0	
OHL Tower Remedial Work	0	14
Network Risk (R£M)	0	0.00
T1 Cost Allowance (£M)	0	

Table 4.6-3: SH-00173 Impact on T1 performance

4.7.4 SH-00174: Charleston-Elmwood OHL Reconductoring^{xxxvi}

This project formed part of the original T1 BP to deliver 2.9km of phase conductor replacement but was deferred to a future regulatory period, due to the better than expected condition of the assets during T1 and a desire to deliver a ‘whole system’ solution for the Transmission & Distribution network across Dundee City.

Intervention on these assets will be considered as part of the Dundee Whole System Strategy for the RIIO-T3 period, under a pre-construction funding allowance for the T2 period.

	Target	Delivered
OHL Conductor Volume (km)	2.9	0
Network Risk (R£M)	0.02	0
T1 Cost Allowance (£M)	0.82	

Table 4.6-4: SH-00174 Impact on T1 performance

4.7.5 SH-00175: Clunie-Coupar Angus Spur OHL Reconductoring^{xxxvii}

This project formed part of the original T1 BP to deliver 76.2km of phase conductor replacement and was delivered during the T1 period.

In addition to the original scope, it was determined through additional inspection & assessment that there was a condition-driver to replace the fittings on this OHL.

	Target	Delivered
OHL Conductor Volume (km)	76.2	76.2
Network Risk (R£M)	0.06	0.05
T1 Cost Allowance (£M)	5.59	
OHL Fittings Volume (km)	0	75.6
Network Risk (R£M)	0	0.05
T1 Cost Allowance (£M)	0	
OHL Tower Refurb	0	126
Network Risk (R£M)	0	0
T1 Cost Allowance (£M)	0	

Table 4.6-5: SH-00175 Impact on T1 performance

4.7.6 SH-00176: Coupar Angus - Birkhill OHL Reconductoring^{xxxviii}

This project formed part of the original T1 BP to deliver 30.6km of phase conductor replacement and was delivered during the T1 period.

In addition to the original scope, it was determined through additional inspection & assessment that there was a condition-driver to replace the fittings on this OHL.

	Target	Delivered
OHL Conductor Volume (km)	30.6	30.6
Network Risk (R£M)	0.02	0.02
T1 Cost Allowance (£M)	2.05	
OHL Fittings Volume (km)	0	30.6
Network Risk (R£M)	0	0.02
T1 Cost Allowance (£M)	0	

Table 4.6-6: SH-00176 Impact on T1 performance

4.7.7 SH-00177: Fort Augustus-Fort William OHL Reconductoring^{xxxix}

This project formed part of the original T1 BP to deliver 86.8km of phase conductor replacement and was delivered during the T1 period.

In addition to the original scope a load driver required an increased rating for these lines, resulting in replacement of both fittings and towers, with costs split between the Load & Non-Load projects.

	Target	Delivered
OHL Conductor Volume (km)	86.8	86.8
Network Risk (R£M)	11.8	11.8
T1 Cost Allowance (£M)	6.48	
OHL Fittings Volume (km)	0	86.2
Network Risk (R£M)	0	2.3
T1 Cost Allowance (£M)	0	
Towers Volume	0	5
Network Risk (R£M)	0	0.8
T1 Cost Allowance (£M)	0	

Table 4.6-7: SH-00177 Impact on T1 performance

4.7.8 SH-00178: Fort Augustus - Quoich OHL Reconductoring^{xl}

This project formed part of the original T1 BP to deliver 19.7km of phase conductor replacement during the T1 period.

In addition to delivery of the original work scope, it was determined through additional inspection & assessment that there was a condition-driver to replace the both the line and towers on this circuit.

	Target	Delivered
OHL Conductor Volume (km)	19.7	19.7
Network Risk (R£M)	79.0	57.8
T1 Cost Allowance (£M)	2.05	
OHL Fittings Volume (km)	0	19.7
Network Risk (R£M)	0	24.5
T1 Cost Allowance (£M)	0	
Towers Volume	0	249
Network Risk (R£M)	0	6.3
T1 Cost Allowance (£M)	0	

Table 4.6-8: SH-00178 Impact on T1 performance

4.7.9 SH-00179: Fort William - Lundavra OHL Reconductoring^{xli}

This project formed part of the original T1 BP to deliver 9.3km of phase conductor replacement and was delivered during the T1 period.

In addition to the original scope, it was determined through additional inspection & assessment that there was a condition-driver to replace the fittings on this OHL.

	Target	Delivered
OHL Conductor Volume (km)	9.3	9.3
Network Risk (R£M)	0.4	0.3
T1 Cost Allowance (£M)	0.95	
OHL Fittings Volume (km)	0	9.0
Network Risk (R£M)	0	0.4
T1 Cost Allowance (£M)	0	

Table 4.6-9: SH-00179 Impact on T1 performance

4.7.10 SH-00180: Inverary – Port Ann OHL Reconductoring^{xlii}

This project formed part of the original T1 BP to deliver 70.4km of phase conductor replacement during the T1 period.

In addition to the original work scope, it was determined through additional inspection & assessment that there was a condition-driver to replace the both the Fittings and Towers on this circuit.

	Target	Delivered
OHL Conductor Volume (km)	70.4	70.7
Network Risk (R£M)	0.15	0.15
T1 Cost Allowance (£M)	15.9	
OHL Fittings Volume (km)	0	69.3
Network Risk (R£M)	0	0.03
T1 Cost Allowance (£M)	0	
Towers Volume	0	129
Network Risk (R£M)	0	0.01
T1 Cost Allowance (£M)	0	

Table 4.6-10: SH-00180 Impact on T1 performance

4.7.11 SH-00181: Inverary – Taynuilt OHL Reconductoring^{xliii}

This project formed part of the original T1 BP to deliver 45.1km of phase conductor replacement during the T1 period.

These works have been deferred to a future regulatory period and are proposed to be part of the Argyll system strategy, currently being developed by us as the Argyll LOTI scheme for Ofgem review in 2022.

	Target	Delivered
OHL Conductor Volume (km)	45.1	0
Network Risk (R£M)	1.61	0
T1 Cost Allowance (£M)	11.93	

Table 4.6-11: SH-00181 Impact on T1 performance

4.7.12 SH-00182: Inverness - Keith OHL Reconductoring^{xliv}

This project formed part of the original T1 BP to deliver 184.1km of phase conductor replacement during the T1 period.

In addition to the original work scope it was determined through additional inspection & assessment that there was a condition-driver to replace the fittings on this circuit.

	Target	Delivered
OHL Conductor Volume (km)	184.1	179.9
Network Risk (R£M)	0.1	0.09
T1 Cost Allowance (£M)	13.6	
OHL Fittings Volume (km)	0	177.0
Network Risk (R£M)	0	0.1
T1 Cost Allowance (£M)	0	
OHL Tower Refurb	0	177.0
Network Risk (R£M)	0	0
T1 Cost Allowance (£M)	0	

Table 4.6-12: SH-00182 Impact on T1 performance

4.7.13 SH-00183: Kintore - Craigiebuckler OHL Reconductoring^{xlv}

This project formed part of the original T1 BP to deliver 34.9km of phase conductor replacement during the T1 period.

In addition to the original work scope it was determined through additional inspection & assessment that there was a condition-driver to replace the fittings on this circuit.

	Target	Delivered
OHL Conductor Volume (km)	34.9	33.8
Network Risk (R£M)	0.07	0.08
T1 Cost Allowance (£M)	2.45	
OHL Fittings Volume (km)	0	33.8
Network Risk (R£M)	0	0.02
T1 Cost Allowance (£M)	0	

Table 4.6-13: SH-00183 Impact on T1 performance

4.7.14 SH-00447: Corriemoillie – Grudie Bridge OHL Reconductoring^{xlvi}

This project formed part of the original T1 BP to deliver 5.5km of phase conductor replacement during the T1 period.

In addition to the original work scope it was determined through additional inspection & assessment that there was a condition-driver to extend replacement both the conductor & fittings from Corriemoillie to Grudie Bridge on this circuit.

	Target	Delivered
OHL Conductor Volume (km)	5.5	9.0
Network Risk (R£M)	0.03	0.02
T1 Cost Allowance (£M)	0.68	
OHL Fittings Volume (km)	0	8.5
Network Risk (R£M)	0	0.03
T1 Cost Allowance (£M)	0	

Table 4.6-14: SH-00447 Impact on T1 performance

4.7.15 SH-00185: Nant Tee OHL Reconductoring^{xlvi}

This project formed part of the original T1 BP to deliver 4.2km of phase conductor replacement during the T1 period.

This work was deferred until a future regulatory period to allow alignment with substation works on the same circuit.

	Target	Delivered
OHL Conductor Volume (km)	4.2	0
Network Risk (R£M)	0.0	0
T1 Cost Allowance (£M)	0.95	

Table 4.6-15: SH-00185 Impact on T1 performance

4.7.16 SH-00186: Shin - Cassley OHL Reconductoring^{xlvi}

This project formed part of the original T1 BP to deliver 38.2km of phase conductor & fittings replacement during the T1 period.

Following further detailed inspection and assessment, the project delivered only a fittings replacement and the OHL reconductoring work was deferred until a future regulatory period.

	Target	Delivered
OHL Conductor Volume (km)	38.3	0
Network Risk (R£M)	1.4	0
T1 Cost Allowance (£M)	1.95	
OHL Fittings Volume (km)	37.7	37.7
Network Risk (R£M)	2.28	1.85
T1 Cost Allowance (£M)	0	

Table 4.6-16: SH-00186 Impact on T1 performance

4.7.17 SH-00187: Shin – Mybster (inc Brora Tee) OHL Reconductoring^{xlix}

This project formed part of the original T1 BP to deliver 188.8km of phase conductor replacement during the T1 period.

Following further detailed inspection and assessment, the project delivered only a fittings replacement and the OHL reconductoring work was deferred until a future regulatory period.

	Target	Delivered
OHL Conductor Volume (km)	188.8	0
Network Risk (R£M)	0.44	0
T1 Cost Allowance (£M)	8.04	
OHL Fittings Volume (km)	188.8	0
Network Risk (R£M)	0	0.15
T1 Cost Allowance (£M)	0	

Table 4.6-17: SH-00187 Impact on T1 performance

4.7.18 SH-00188: St Fergus – Peterhead Grange OHL Reconductoring^l

This project formed part of the original T1 BP to deliver 12.2km of phase conductor replacement during the T1 period.

In addition to the original work scope it was determined through additional inspection & assessment that there was a condition-driver to replace the fittings on this circuit.

	Target	Delivered
OHL Conductor Volume (km)	12.2	12.2
Network Risk (R£M)	0.92	0.82
T1 Cost Allowance (£M)	1.36	
OHL Fittings Volume (km)	0	11.4
Network Risk (R£M)	0	0.16
T1 Cost Allowance (£M)	0	

Table 4.6-18: SH-00188 Impact on T1 performance

4.7.19 SH-00189: Tealing - Arbroath OHL Reconductoring^{li}

This project formed part of the original T1 BP to deliver 46.1km of phase conductor and fittings replacement during the T1 period.

Following further detailed inspection & assessment, the work scope was reduced to only address the 28.6km of conductor & fittings that would reach end of life during the T1 period. The remainder of the works were deferred to a future regulatory period.

	Target	Delivered
OHL Conductor Volume (km)	46.1	28.6
Network Risk (R£M)	0.43	0.14
T1 Cost Allowance (£M)	3.13	
OHL Fittings Volume (km)	0	28.6
Network Risk (R£M)	0.54	0.19
T1 Cost Allowance (£M)	0	
OHL Tower Refurb	0	78
Network Risk (R£M)	0	0
T1 Cost Allowance (£M)	0	

Table 4.6-19: SH-00189 Impact on T1 performance

4.7.20 SH-00190: Whistlefield - Dunoon OHL Reconductoring^{lii}

This project formed part of the original T1 BP to deliver 38.1km of phase conductor & fittings replacement during the T1 period.

Following further detailed inspection & assessment, the work scope was reduced to deliver a fittings-only replacement on this circuit. The phase conductor replacement was deferred to a future regulatory period.

	Target	Delivered
OHL Conductor Volume (km)	38.1	0
Network Risk (R£M)	0.16	0
T1 Cost Allowance (£M)	3.41	
OHL Fittings Volume (km)	38.1	38.1
Network Risk (R£M)	0.27	0.21
T1 Cost Allowance (£M)	0	

Table 4.6-20: SH-00190 Impact on T1 performance

4.7.21 SH-00454: Kintore – Blackhillock OHL Fittings Replacement^{liii}

This project did not form part of the original T1 BP.

Detailed inspection & assessment of the route indicated that the fittings on this circuit would reach end of life during the T1 period. This resulted in 100.6km of fittings replacement added to the T1 plan.

	Target	Delivered
OHL Fittings Volume (km)	0	100.6
Network Risk (R£M)	0	0.04
T1 Cost Allowance (£M)	0	

Table 4.6-21: SH-00454 Impact on T1 performance

4.7.22 SH-00450: Quoich – Broadford OHL Fittings Replacement^{liv}

This project did not form part of the original T1 BP.

Detailed inspection & assessment of the route indicated that the fittings on this circuit would reach end of life during the T1 period. This resulted in 24.3km of fittings replacement added to the T1 plan.

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	Target	Delivered
OHL Fittings Volume (km)	0	24.3
Network Risk (R£M)	0	32.3
T1 Cost Allowance (£M)	0	

Table 7.6-22: SH-00450 Impact on T1 performance

4.7.23 SH-00522: Sooty Wells Diversion^{lv}

This project did not form part of the original T1 BP and was undertaken following an ESQCR review of the safety to the public from the OHL assets in the vicinity. It was determined that the safest solution was to underground a short section of OHL. There was no NOMS output associated with this work.

	Target	Delivered
Towers Volume	0	2
Network Risk (R£M)	0	0.00
T1 Cost Allowance (£M)	0	
OHL Conductor	0	0.00
Network Risk (R£M)	0	0.01
T1 Cost Allowance (£M)	0	
OHL Fittings	0	0.3
Network Risk (R£M)	0	0.02
T1 Cost Allowance (£M)	0	

Table 4.6-23: SH-00522 Impact on T1 performance

5 Conclusions

Our performance across the RIIO-T1 period is documented in this paper and summarised in table 5-1 of this paper, replicated below.

Category (All Voltages)	Volume Target	Volume Delivered	Network Risk Target (R£M)	Network Risk Delivered (R£M)	Cost Allowance (£M)	Cost Delivered (£M)
Transformers	16	16	69.6	57.4	64.5	
Circuit Breakers	29	26	168.2	180.2	19.3	
Reactors	0	10	9.2	2.5	0	
Cables (km)	14.72	15.3	17.3	17.3	12.2	
OHL Conductor (km)	927.3	564	170.5	161.2	118.1	
OHL Fittings (km)	122.4	913.0	231.0	134.7	0	
OHL Towers	0	385	532.5	543.7	0	
TOTALS	-	-	1,198.3	1,097.0	214.2	313.5

Table 5-1: RIIO-T1 Performance Summary

During RIIO-T1 we have delivered material improvement in the risk, and therefore reliability, of the transmission network in the north of Scotland on which our demand and renewable generation customers rely.

- Network risk reduction - **21% better** than the reduction in risk for which we were funded - R£54.3m better than our target
- Total remaining network risk - **4.53% better** than the total level of remaining network risk (our Absolute Target) which we were funded to deliver (R£54.3m improvement)
- A more reliable network - over **R£100m reduction** in network risk during RIIO-T1 (including changes in deterioration) with **99.999% network reliability**

This paper provides evidence, justification and conclusions in three key areas of the RIIO-T1 NOMs Close Out assessment process:

4. **Basis of target:** Confirming the RIIO-T1 settlement did not include all OHL fitting volumes and consequently the delivered risk reduction must be included in our outturn delivery (not be valued at zero).
5. **Materiality of deadband:** That an appropriate deadband for the NOMs Close Out process would be +/- 0.7% of an Absolute risk target, which is equivalent to +/- 5% of a funded Relative risk target and therefore consistent with the policy intent set out by Ofgem in the RIIO-T1 settlement.

6. **Justification of delivery:** We include evidence of all project interventions undertaken in RIIO-T1, demonstrating the need based on network condition and the necessity for replacement during the period.

We believe the core principle, that remains consistent with the RIIO-T1 policy, should be that if we can demonstrate that we did the right thing in respect of our network reliability obligations and delivered that work efficiently, then customers should fund that investment.

In delivering an outturn secondary deliverable measure 4.53% better than our Absolute target, 21% better than the funded improvement, we have incurred £99.3m (£72.9m 09/10 prices) of additional Totex.

The evidence provided in this submission (see supporting Engineering Justification Papers) demonstrates the driver for intervention during RIIO-T1. Customers have therefore benefited from the reliability that this investment has brought and therefore should fund that incremental expenditure.

We are seeking recovery of the additional totex we have invested NOMs delivery through the mechanisms provided for in the RIIO-T1 settlement.

We believe the next steps in this assessment process are clear.

- Ofgem can use a **correctly calibrated deadband** to control what levels of performance are taken forward for a review of justified delivery. We have shown that performance of +/- 0.7% of our Absolute risk achieves that.
- Ofgem is then able to review, and will find **evidence of and justification for, our delivered activity**. It will be able to conclude that our investment decisions have been driven by the right response to the need of our network and customers, that corresponding investment did occur and therefore that **allowances should be recovered**.
- It can then determine whether the over delivery warrants an additional incentive reward and can choose to confirm that or not.

We do not believe that it is a valid outcome for Ofgem to conclude the work was required but that consumers should not pay for it.

We remain ready to support Ofgem in this review process and are able to provide any further clarification required to allow it to conclude assessment of our Stage 5 submission.

Appendix A Step 1: Determine Fittings Valuation Treatment

See Separate Paper

Appendix B Step 2: Review Deadband Case

See Separate Paper

Appendix C List of Engineering Justification Papers

1. T1CO-PCDS-0002_Dudhope GSP_SH-00146
2. T1CO-PCDS-0005_Lochay PS – TCA_R1_SH-00149
3. T1CO-PCDS-0006_Milton of Craigie GSP_SH-00150
4. T1CO-PCDS-0007_Nant PS_R1_SH-00151
5. T1CO-PCDS-0008_Sloy PS and GSP SH-00152
6. T1CO-PCDS-0009_Willowdale GT_SH-00153
7. T1CO-PCDS-0011_Keith 132kV CBs_SH-00155
8. T1CO-PCDS-0012_Milton of Craigie switchgear replacement_SH-00156
9. T1CO-PCDS-0013_St Fergus Mobil CBs_SH-00157
10. T1CO-PCDS-0015_Persley CB_SH-00159
11. T1CO-PCDS-0018_Beaully to Deanie SH00172
12. T1CO-PCDS-0019_Burghmuir Spur 132kV OHL R1 SH-00173
13. T1CO-PCDS-0020_Charleston Elmwood SH-00174
14. T1CO-PCDS-0021_Coupar Angus to Clunie R1 SH-00175
15. T1CO-PCDS-0022_Coupar Angus to Birkhill R1 SH-00176
16. T1CO-PCDS-0023_Fort Augustus to Fort William R1 SH-00177
17. T1CO-PCDS-0024_Fort Augustus to Quoich R1 SH-00178
18. T1CO-PCDS-0025_Fort William – Lundavra R1 SH-00179
19. T1CO-PCDS-0026_Inverary – Port Ann SH-00180
20. T1CO-PCDS-0027_Inverary Taynault 132kV SH-00181
21. T1CO-PCDS-0028_Beaully to Keith SH-00182
22. T1CO-PCDS-0029_Kintore to Craigiebuckler R1 SH-00183
23. T1CO-PCDS-0031_Nant Tee OHL Reconductor SH-00185
24. T1CO-PCDS-0032_Cassley to Shin 132kV R1 SH-00186
25. T1CO-PCDS-0033_Shin to Mybster SH-00187
26. T1CO-PCDS-0034_St Fergus to Peterhead Grange R1 SH-00188
27. T1CO-PCDS-0035_Tealing to Arbroath R1 SH-00189
28. T1CO-PCDS-0036_Garelochhead to Dunoon circuit R1 SH-00190
29. T1CO-PCDS-0058_Foyers 275kV Switchgear_R1 SH-00154
30. T1CO-PCDS-0059_Abernethy CB (on GT1 & GT2)_R1_SH-00411
31. T1CO-PCDS-0060_Brechin CB 110 replacement
32. T1CO-PCDS-0063_Harris TX replacement R1 SH-00425
33. T1CO-PCDS-0064_Ardmore TX replacement R1 SH-00426
34. T1CO-PCDS-0068_Tealing SGT1 replacement R1 SH-00432
35. T1CO-PCDS-0069_Brora GT Replacement R1 SH-00433
36. T1CO-PCDS-0071_St Fergus Gas GT Replacement_R1 SH-00435
37. T1CO-PCDS-0072_33kV Shunt Reactor Replacement_SH-00436
38. T1CO-PCDS-0080_Corriemoillie Grudie Bridge SH-00447
39. T1CO-PCDS-0082_QB 132kV Refurbishment SH-00450
40. T1CO-PCDS-0083_Kintore Blackhillock Polymerics SH-00454
41. T1CO-PCDS-0084_Keith 275kV circuit breaker_SH-00504
42. T1CO-PCDS-0085_Stornoway Transformer Replacement_R1 SH-00507
43. T1CO-PCDS-0086_Sootywells Diversion R1 SH-00522
44. T1CO-PCDS-0088_Nant TX – Emergency_SH-00563
45. T1CO-PCDS-0092_Shin 132kV CBs_SH-00646
46. T1CO-PCDS-0093_Lunanhead GT2 Replacement_SH-00651

Appendix D References

https://www.ofgem.gov.uk/sites/default/files/docs/2012/12/2_riiot1_fp_outputsincentives_dec12.pdf

ii

https://www.ofgem.gov.uk/sites/default/files/docs/2012/12/2_riiot1_fp_outputsincentives_dec12.pdf - paragraph 2.2

iii Table 2.1 of the RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas confirm this. The incentive it adopted to encourage justified variations was a potential award and recovery of financing costs due to timing of delivery. Ofgem confirmed that recovery of allowances for over delivery would occur for both justified and unjustified delivery.

iv Tab 3.3.1_Normalisations_Targets

v Tab 3.3.2_Normalisations_Delivery

vi Tab 3.1.1_Targets_Volumes_ET

vii Tab 4.1.1_Expenditure_Allowed

viii T1CO-PCDS-002_Dudhope GSP_SH-00146

ix T1CO-PCDS-0005_Lochay PS – TCA_R1_SH-00149

x T1CO-PCDS-0006_Milton of Craigie GSP_SH-00150

xi T1CO-PCDS-0007_Nant PS_R1_SH-00151

xii T1CO-PCDS-0088_Nant TX – Emergency_SH-00563

xiii T1CO-PCDS-0008 Sloy PS and GSP SH-00152

xiv T1CO-PCDS-0009_Willowdale GT_SH-00153

xv T1CO-PCDS-0064_Ardmore TX replacement R1 SH-00426

xvi T1CO-PCDS-0071_St Fergus Gas GT Replacement_R1 SH-00435

xvii T1CO-PCDS-0085_Stornoway Transformer Replacement_R1 SH-00507

xviii T1CO-PCDS-0069_Brora GT Replacement R1 SH-00433

xix T1CO-PCDS-0063_Harris TX replacement R1 SH-00425

xx T1CO-PCDS-0068_Tealing SGT1 replacement R1 SH-00432

xxi T1CO-PCDS-0093_Lunanhead GT2 Replacement_SH-00651

xxii T1CO-PCDS-0058_Foyers 275kV Switchgear_R1 SH-00154

xxiii T1CO-PCDS-0011_Keith 132kV CBs_SH-00155

xxiv T1CO-PCDS-0012_Milton of Craigie switchgear replacement_SH-00156

xxv T1CO-PCDS-0013_St Fergus Mobil CBs_SH-00157

xxvi T1CO-PCDS-0015_Persley CB_SH-00159

xxvii T1CO-PCDS-0084_Keith 275kV circuit breaker_SH-00504

xxviii T1CO-PCDS-0060_Brechin CB 110 replacement

xxix T1CO-PCDS-0059_Abernethy CB (on GT1 & GT2)_R1_SH-00411

xxx T1CO-PCDS-0092_Shin 132kV CBs_SH-00646

xxxi T1CO-PCDS-0072_33kV Shunt Reactor Replacement_SH-00436

xxxii T1CO-PCDS-0086_Sootywells Diversion R1 SH-00522

xxxiii Although our allowances for fittings are zero, we identified 3 lines from the T1 SQs, totalling 122.4km that were to be included. The funding for these sits within the associated Conductor allowances

xxxiv T1CO-PCDS-0018 Beaully to Deanie SH00172

xxxv T1CO-PCDS-0019 Burghmuir Spur 132kV OHL R1 SH-00173

xxxvi T1CO-PCDS-0020 Charleston Elmwood SH-00174

xxxvii T1CO-PCDS-0021 Coupar Angus to Clunie R1 SH-00175

xxxviii T1CO-PCDS-0022 Coupar Angus to Birkhill R1 SH-00176

xxxix T1CO-PCDS-0023 Fort Augustus to Fort William R1 SH-00177

xl T1CO-PCDS-0024 Fort Augustus to Quoich R1 SH-00178

xli T1CO-PCDS-0025 Fort William – Lundavra R1 SH-00179

xlii T1CO-PCDS-0026 Inverary – Port Ann SH-00180

xliii T1CO-PCDS-0027 Inverary Taynault 132kV SH-00181

xliv T1CO-PCDS-0028 Beaully to Keith SH-00182

xlvi T1CO-PCDS-000029 Kintore to Craigiebuckler R1 SH-00183

xlvi T1CO-PCDS-0080 Corriemoillie Grudie Bridge SH-00447

xlvi T1CO-PCDS-0031 Nant Tee OHL Reconductor SH-00185

xlvi T1CO-PCDS-0032 Cassley to Shin 132kV R1 SH-00186

xlvi T1CO-PCDS-0033 Shin to Mybster SH-00187

l T1CO-PCDS-0034 St Fergus to Peterhead Grange R1 SH-00188

li T1CO-PCDS-0035 Tealing to Arbroath R1 SH-00189

lii T1CO-PCDS-0036 Garelochhead to Dunoon circuit R1 SH-00190

liii T1CO-PCDS-0083 Kintore Blackhillock Polymerics SH-00454

liv T1CO-PCDS-0082 QB 132kV Refurbishment SH-00450

lv T1CO-PCDS-0086 Sootywells Diversion R1 SH-00522