Active Equipment Programme - OFGEM justification paper	
Name of Scheme/Programme	Fibre Replacement and Repair Programme
Primary Investment Driver	Asset Health
Scheme reference/ mechanism or category	SPNLT2056 Non-Lead Asset – Protection, Control, Telecoms and Metering
Output references/type	NLRT2SP2056 / Non-Lead
Cost	£ 0.8m
Delivery Year	RIIO-T2
Reporting Table	C0.7 Non-load Master / C2.2a Scheme Summary
Outputs included in RIIO T1 Business Plan	No

Issue Date	Issue No	Amendment Details
October 2019	Issue 1	First issue of document
December 2019	Issue 2	Cost updated

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1 Introduction

Telecommunications are essential to provide both protection signalling and SCADA monitoring for the transmission network to ensure safe, reliable and secure electrical network management. The evolution of different telecommunication technologies has taken place through the last 20 years. This has resulted in a large penetration of optical fibre communications into the SPT Telecomms network.

The installation of a fibre network has improved the overall reliability and resilience of the telecommunications network. The ability to manage increased volumes of data (for both protection and monitoring) is essential for provision of real time system management and generation load management to ensure the security of the transmission network.

The ability to support the telecoms equipment is a key consideration for the replacement of discrete asset types. Due to the nature of the strategic telecoms network, it is essential any equipment that fails can be replaced or repaired without compromising the network. Similarly, it is important that equipment can be reconfigured as required.

2 Background Information

The initial process of transferring to a fibre optic communication network began in the early 1990s as the technology was embraced by national infrastructure as the way forward to deliver UK telecommunications and data requirements of the future. The original assets installed were leading edge equipment with an expected life of approximately 25 years with recognition that investment to maintain their integrity would be required beyond this timescale.

Some of these assets have exhibited some specific degradation that if not addressed will result in failure. Fibre system investment is now required due to degradation of early direct buried cables, ADSS (All Dielectric Self Supporting) cable attachments and fibre joint chambers.

Like any buried equipment, fibre optic telecommunications equipment is vulnerable to damage by 3rd parties undertaking digging activities in and around the area of installation. While SPT undertake all practical measures to mitigate this, damage is still sustained to these fibre systems and faults require to be reactively repaired.

The fibre infrastructure carries critical services such as protection communications and signalling, and SCADA communications therefore investment is essential to prevent failures and the subsequent interruption of critical services.

3 Optioneering

The following is a summary of the options considered for this project.

	Option	Status	Reason for rejection
1	**Do nothing**: Maintain the existing telecoms network as is.	Rejected	Rejected on the basis that system security would be too compromised by this approach in both the short and long term and would not deliver the network resilience as required.
2	**Repair / Replacement of Equipment:** Intervention to ensure that the telecomms network provides the	Proposed	-

	transmission system with the critical services to the required standard.		

4 Detailed analysis

4.1 Selected option

The earliest parts of the fibre network are aging towards their expected end of life and this has been verified by testing and condition assessment.

Empirical evidence of the recent XY route direct buried cable from the substation to the recently reconductored overhead line has shown that the fibre cores of the 20 year old cable have degraded to such an extent that the risk of an in service failure was intolerable (any movement of the cable may result in the fibre core breaking). It is proposed to replace it and the other similar direct buried fibre tails prior to in service failure.

The following is proposed to mitigate the risk of an in-service failure.

- Repair of 8km of ADSS: The mechanism for attachment of the cable to the towers is degrading and is in need of replacement.
- 12 x direct buried substation fibre tails

In addition, SPT have been experiencing a high failure rate of carriageway and footway fibre chambers as notified via local authority street works defects. It is proposed to include a programme of direct replacements of such chambers as notified at the existing failure rate.

Any other fibre system faults will be reactively repaired on failure.

RIIO T2 Fibre Activity Profile	2021	2022	2023	2024	2025
	Units	Units	Units	Units	Units
Fibre ADSS repair	8km				
Fibre overhead line UG tail replacements	4	4	2	2	
Fibre Cable Chamber Repairs	2	2	2	2	2

4.2 Innovation

While the technology used in the project will be standard with a proven track record and the installations executed in line with industry standards, SPT will aim to identify innovate ways of project delivery and installation to deliver the resilient telecoms network required.

5 Conclusion

The nature of technology and data requirements makes the reliable operation of the telecoms a fundamental factor in transmission network security.

The proposed solutions, maintains telecomms service levels and delivers a resilient telecoms network for the future with the ability, when combined with the other proposals in the business plan, to deliver and support the transition to a Low Carbon Network.

- Costs: £ 0.8 m
- Timing of investment: RIIO-ET2 period
- Declared outputs: N/A

6 Future Pathways – Net Zero

We have reviewed this project against the criteria set out within the business plan guidance and have assessed that it does not prevent achievement of our Net Zero plans or lead to stranded assets.

7 Outputs included in RIIO T1 Plans

N/A