

Date of Submission

May 2021

Network Innovation Allowance Progress Report

Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form.

Network Licensees must publish the required Project Progress information on the Smarter Networks Portal by 31st July 2014 and each year thereafter. The Network Licensee(s) must publish Project Progress information for each NIA Project that has developed new learning in the preceding relevant year.

Project Progress

Project Title

Low Voltage – Underground Fault Location Technologies (LV-UFLT)

Project Reference

NIA_SSEN_0037

Funding Licensee(s)

Scottish and Southern Electricity Networks, Southern Electric Power Distribution

Project Start Date

June 2019

Project Duration

1 year and 6 months

Nominated Project Contact(s)

SSEN NIA Programme Delivery Manager – Colin Mathieson

Scope

To assess how acoustic and FPI technologies perform when managing faults on the LV Network. The project will consist of 3 Phases

- Phase 1 - (3 Months) – Evaluation of identified technologies on a test network. Design process in preparation for field trials on DNO LV network.
- Phase 2 – (12 Months) – Field trials using technologies on sustained LV faults and transient fault circuits.
- Phase 3 – (3 Months) Project evaluation that could lead to business as usual. Dissemination of project to other network licensees and interested parties.

Objectives(s)

By the end of the project

To have established the technical and commercial viability of the best in class of acoustic cable fault location devices and fault passage indicators working in conjunction with existing proven LV fault location technologies.

To have maximised the portfolio of technologies available for LV fault location and made recommendations for optimal adoption of the suitable devices for business as usual use.

To have disseminated the learning from the project through annual or exceptional events for the benefit of GB customers.

Success Criteria

This project will be deemed a success if all planned activities are completed, enabling the complete evaluation of whether acoustic devices are suitable complementary devices for quick underground LV fault location

Performance Compared to the Original Project Aims, Objectives and Success Criteria

The project has made the following progress against each of the stated objectives

Establishing the technical and commercial viability of the best in class of acoustic cable fault location devices and fault passage indicators working in conjunction with existing proven LV fault location technologies.

Whilst there is a comparison of products still ongoing until the end of the field trials, the methodology of technically being able to use acoustic devices and fault passage indicators on low voltage cable faults in conjunction with existing equipment has been proven.

The commercial viability will be addressed by the end of the field trials once there is a complete assessment of all the equipment being trialled in the project.

Maximising the portfolio of technologies available for LV fault location and make recommendations for optimal adoption of the suitable devices for business as usual use.

The recommended portfolio that can successfully locate faults will be completed by the end of the field trials once there is a complete assessment of all the equipment being trialled in the project.

Disseminating the learning from the project through annual or exceptional events for the benefit of GB customers.

This is planned for later in the year.

Required Modifications to the Planned Approach During the Course of the Project

Change request to increase budget by £50,000 from £346,000 to £396,000. Budget increase to facilitate two additional operational regions taking part in trials. Expanding the trial to include two additional regions increases the diversity of terrain and electrical network configurations, as well as widening the experience range of staff.

Lessons Learnt for Future Projects

Spending quality time initially developing a step-by-step work flow process to investigate LV faults via both the acoustic and FPI technologies with the help of the operational teams in a workshop environment has had positive results. The early involvement of the operational teams, incorporating their suggestions, has made a significant difference generating and then maintaining momentum for the onward field trial element.

Maintaining a high level of engagement with the operational teams when developing the step-by-step work flow process, has meant continued feedback from fault investigations on the actual network. This has allowed us to ensure the process for using acoustic and FPI technologies to locate underground LV faults is suitable for a range of physical terrains and network configurations.

As the operational staff are field based, the fault-finding work flows and means by which to record comments have been made available on smartphones. Having the capability to capture data from the field trials has been crucial and allowed us to report back to all involved in the project, at all levels. This data will also support the final assessment of acoustic and FPI LV fault finding equipment used for the project.

The Outcomes of the Project

The project has successfully created a step-by-step work flow process using both acoustic and FPI technologies in conjunction, which brings about improvements in finding the location of LV underground faults.

Positive engagement from operational teams was achieved as they were included in developing the fault-finding work flow process, using the two new types of technology, via hands-on experience on a test network where different types of underground LV faults could be created. The time spent with the different types of fault-finding technologies, in a safe and controlled environment, allowed an understanding of the equipment and the best way it could be used.

Through the rigorous trialling within the test network and the subsequent field trials, both the acoustic and FPI methods of LV underground fault finding have been very promising. The FPI technology has been successful in narrowing down the search area; if there are several network circuit spurs the FPI kit can correctly identify the single circuit with the fault. With the correct network circuit spur identified then the acoustic kit, which is based upon electromagnetic technology, can be used to pin-point the location of the fault.

Data Access

See Network Innovation Competition (NIC) and Network Innovation Allowance (NIA) Data Sharing Procedure at <https://www.ssen.co.uk/InnovationLibrary/Distribution/>

Foreground IPR

N/A