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NIA ENWL009
Cable Health Assessment – LV

Progress Report

31 July 2019

VERSION HISTORY

Version	Date	Author	Status	Comments
V1.0		Kieran Bailey	Final	

REVIEW

Name	Role	Date
Lucy Eyquem	Innovation PMO Manager	03.07.19
Paul Turner	Innovation Manager	26.07.19

APPROVAL

Name	Role	Date
Steve Cox	Engineering & Technical Director	29.07.19

CONTENTS

GLOSSARY

Term	Description
BAU	Business as usual
CBRM	Condition based risk management
IPR	Intellectual property rights
LV	Low voltage
PCB	Printed Circuit Board
R&D	Research and development

1 PROJECT FUNDAMENTALS

Title	Cable Health Assessment – Low Voltage
Project reference	NIA_ENWL009
Funding licensee(s)	Electricity North West Limited
Project start date	November 2015
Project duration	5 years 9 months
Nominated project contact(s)	Kieran Bailey (innovation@enwl.co.uk)

2 PROJECT SCOPE

This project will develop the technology, data processing, support services, business as usual (BAU) operating model and condition based risk management (CBRM) asset health modelling required allowing low voltage (LV) cable condition data to be included in the condition based risk model giving network operators the ability to assign health indices to its low voltage cables and associated networks.

3 OBJECTIVES

- Develop low cost technology which can be used to define the condition of the low voltage network
- Develop BAU support services to allow wide-scale deployment
- Develop the data processing and modelling necessary to allow inclusion in the CBRM framework
- Installation of hardware at a number of distribution substations (expected to be 500)
- Run a live trial of the new models and associated support services
- Produce all the necessary documentation (specifications and models) to allow adoption by other network operators.

4 SUCCESS CRITERIA

- Production of hardware and backend data processing technologies
- Production of the relevant processes and models to allow LV cable condition to be included in the CBRM framework
- Development of a BAU operating model to allow wide-scale deployment
- Production of the CBRM methodology, specifications and codes of practice to permit replication.

5 PERFORMANCE COMPARED TO THE ORIGINAL PROJECT AIMS, OBJECTIVES AND SUCCESS CRITERIA

The project has been focused on the requirements of the hardware necessary to capture the condition of the cables. Project partner, Kelvatek, has conducted testing to assess what degradation may look like and how it can be measured. This testing will help to inform what measurements are taken and also how the measurements are processed to give a condition.

Investigations are continuing into the practicalities of installing measurement equipment at different types of distribution substation to inform the design of the site hardware.

Prototype electronic circuitry has been designed, built and tested. The electronic circuitry is used to acquire, condition, process, store and communicate data for the cable health assessment system.

Following laboratory and test network evaluation, system components are being revised for rollout and further trials on LV networks.

Device software has been developed to deliver basic functionality.

System software and fault detection/triggering algorithms concept have been developed and agreed. These components will be refined as more data becomes available from field trials on LV networks.

The project was due to be completed in November 2018 but significant challenges have been faced, resulting in a revised completion date of August 2021.

Since July 2018 twenty six units have been installed with all reporting back to the Kelvatek server. Analysis is ongoing to identify the operational trigger values for the previously developed algorithms.

The build of the Cable Health units has been affected by the ability of PCB manufacturers to procure components and fabricate the complex digital boards. This has severely impacted the delivery plan.

Resource issues both with Cable Health build and installation have also resulted in delays. A review of resources has been undertaken resulting in a revised installation plan, with all units installed by August 2019.

6 REQUIRED MODIFICATIONS TO THE PLANNED APPROACH DURING THE COURSE OF THE PROJECT

There have been no changes to the planned approach.

7 LESSONS LEARNED FOR FUTURE PROJECTS

The project is in its early stages and at this point there are no lessons learned to share. This will change as the project progresses.

8 THE OUTCOME OF THE PROJECT

Not applicable.

9 DATA ACCESS

Electricity North West's innovation data sharing policy can be found on our website.

There has been no data collected in the course of this project.

10 FOREGROUND IPR

The project will develop additional knowledge of cable degradation using LV cable test facilities at Kelvatek and will be used to ultimately develop a monitoring device with sufficient bandwidth to detect and measure cable condition. Kelvatek own the IPR for the specification for the sensor and trial units which can be fitted to the busbar without the need for a shutdown. The technology will be made available for purchase from Kelvatek and the method used for the trials will be made available via Electricity North West for others to replicate the project.

11 PLANNED IMPLEMENTATION

Not applicable.

12 OTHER COMMENTS

Not applicable.