

NIA ENWL009 Cable Health Assessment – LV

Progress Report

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VERSION HISTORY

Version	Date	Author	Status	Comments
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REVIEW

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APPROVAL

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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. Our Project partner, Kelvatek, have 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.

Device software has been developed to deliver basic functionality and is operating successfully.

System software and fault detection/triggering algorithms concepts 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 180 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. At present a time trigger only has been applied to all devices, with data sampling on a one hour basis. The purpose of using time triggers initially is to understand what is “noise” relative to an event. Each installation has a different noise level, which if not filtered out, would effectively cause erroneous triggers. This data is being evaluated to develop the first event based triggers which will be rolled out in the coming months.

The build of trial Cable Health units has been affected by procurement and technical challenges around the complex electronics hardware, which has impacted the device manufacture and 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 being installed by August 2020.

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.