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Bringing energy to your door

NIA ENWL004
Combined Online Transformer Monitoring

Progress Report

31 July 2020

VERSION HISTORY

Version	Date	Author	Status	Comments
V1.0		Ben Ingham		

REVIEW

Name	Role	Date
Lucy Eyquem	Innovation PMO Manager	29.07.20
Dan Randles	Head of Innovation	30.07.20

APPROVAL

Name	Role	Date
Steve Cox	Engineering & Technical Director	31.07.20

CONTENTS

GLOSSARY

Term	Description
DGA	Dissolved gas analysis
DNO	Distribution network operator
IFI	Innovation Funding Incentive
IPR	Intellectual property rights
LCN Fund	Low Carbon Networks Fund
NIA	Network Innovation Allowance
PD	Partial discharge
RIIO-EDI	First electricity distribution price control to reflect the new RIIO model (Revenue = Incentives + Innovation + Outputs)

1 PROJECT FUNDAMENTALS

Title	Combined Online Transformer Monitoring
Project reference	NIA_ENWL004
Funding licensee(s)	Electricity North West Limited
Project start date	September 2014
Project duration	8 years
Nominated project contact(s)	Ben Ingham (innovation@enwl.co.uk)

2 PROJECT SCOPE

Previous research carried out under an Innovation Funding Incentive (IFI) project defined an oil regeneration window for transformers at or near the end of their design life which would extend it by approximately ten years. The First Tier Low Carbon Networks Fund (LCN Fund) project deployed online monitoring equipment at six sites where the oil regeneration technique will be used.

This Network Innovation Allowance (NIA) version of the First Tier project will validate the data from the monitoring equipment and use it to calibrate the previous IFI research. These results will then be fed into data visualisation software that has been developed to allow consistent comparison.

Electricity North West will work closely with an academic resource to validate the data and calibrate the life extension results once sufficient online data has been recorded for a significant time period to allow the results to be reliable and consistent.

3 OBJECTIVES

This project is split into two distinct phases:

Phase 1: the development of a dashboard/decision tool to be used by Electricity North West. This phase was completed by April 2016.

Phase 2: the data validation of existing research into transformer life extension by oil regeneration. This phase was due to be completed by September 2017 but has been extended to allow for further chemical ageing and degradation processes to occur and to be validated against the research results.

4 SUCCESS CRITERIA

- Completion of a dashboard and decision tool utilising the online results
- Validation and calibration of the actual end of life oil regeneration results against predicted values derived from academic research.

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

The project is currently on target against the original aims, objectives and criteria for oil regeneration. However, due to the importance of the tap changer acoustic monitoring innovation research a separate project has been established to focus on that area and consequently it is no longer considered as part of this project. The tap changer project is NIA_ENWL012 Tap Changer Monitoring.

As reported previously the project is currently in the data gathering and analysis phase to confirm the benefits of applying this approach. To date the equipment continues to perform as expected.

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

No modifications to the planned approach are required at this time although the selection of three alternative sites coupled with some delay in the planned oil regeneration dates will impact on the data validation and project end dates.

Due to the importance of the tap changer acoustic monitoring innovation research a separate project has been established, reference NIA_ENWL0012 Tap Changer Monitoring.

7 LESSONS LEARNED FOR FUTURE PROJECTS

The oil regeneration research has been embedded as business as usual within Electricity North West as part of its RIIO-EDI strategy and could easily be adapted by other distribution network operators (DNOs).

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.

10 FOREGROUND IPR

Not applicable.

11 PLANNED IMPLEMENTATION

Not applicable.

12 OTHER COMMENTS