NIA Project Registration and PEA Document

Notes on Completion: Please refer to the **NIA Governance Document** to assist in the completion of this form. Please use the default font (Calibri font size 10) in your submission. Please ensure all content is contained within the boundaries of the text areas. The full-completed submission should not exceed 6 pages in total.

Project Registration

Project Title	**Project Reference**
A Statistical model for determining cut out failures	**ENWL 029**

Funding Licensee(s)	**Project Start Date**	**Project Duration**
ENW	Dec 2021	18 months

Nominated Project Contact(s)	**Project Budget**
InnovationTeam@enwl.co.uk	£138,000

Problem(s)

Across the UK, DNOs are faced with an aging population of cut outs in customer premises. With the rise of self-submitted meter readings, and the roll out of Smart Meters, these are no longer routinely observed by trained personnel. As such these units are currently replaced on failure when reported by customers or meter change operatives, leading to disruption and potential safety issues.

Method(s)

The project proposes to take an engineering-led approach by carrying out a combination of literature review and data analysis around modes of cut out failure. This will be coupled with a set of laboratory analyses of failed units to understand how these failure modes manifest. The aim will be to use this information to generate a condition assessment model to allow targeted replacement of cut outs in a controlled manner.

Scope

The project will carry out the following:
Examine existing ENW data around cut out failures, along with publicly available manufacturer data and use this to create a statistical model of cut out failure modes. If required a forensic analysis of around 100 units from the ENW license area will be carried out and used to further refine the model

Objective(s)

To create a statistical model around cut out failure modes

To refine the model following the forensic examination of around 100 units

Success Criteria

A statistical model of cut out failure modes produced to help inform the asset replacement strategy

Technology Readiness Level at Start	**Technology Readiness Level at Completion**
TRL1~~7~~	TRL4~~9~~

Project Partners and External Funding

Potential for New Learning

If successful, the project will create a statistical model that can assist with better targeting the asset replacement programme for cut outs

Scale of Project

This project will take the form of a desk top research study to create the statistical model, with additional laboratory examination of units to refine the model.

Geographical Area

North West England

Revenue Allowed for in the RIIO Settlement

£0

Indicative Total NIA Project Expenditure

£125,454

Project Eligibility Assessment

Specific Requirements 1

1a. A NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

A specific piece of new (i.e. unproven in GB, or where a Method has been trialled outside GB the Network Licensee must justify repeating it as part of a Project) equipment (including control and communications systems and software)	☐
A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)	☒
A specific novel operational practice directly related to the operation of the Network Licensees System	☐
A specific novel commercial arrangement	☐

Specific Requirements 2

2a. Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees ☒

Please answer one of the following:

i) Please explain how the learning that will be generated could be used by relevant Network Licenses.

The statistical model will be made available to other network licensees allowing them to apply it to their assets and asset replacement programme.

ii) Please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the Project.

This project will address the 'Improve Network Reliability' objective which sits in our Optimised Assets and Practices theme

Is the default IPR position being applied?

Yes ☒

No ☐

If no, please answer i, ii, iii before continuing:

i) Demonstrate how the learning from the Project can be successfully disseminated to Network Licensees and other interested parties

ii) Describe how any potential constraints or costs caused, or resulting from, the imposed IPR arrangements

iii) Justify why the proposed IPR arrangements provide value for money for customers

2b. Has the Potential to Deliver Net Financial Benefits to Customers ☒

Please provide an estimate of the saving if the Problem is solved.

This project is expected to lead to method of better targeting the replacement of cut out, which will allow for a more efficient allocation of staff over the current fix on failure method employed.

Please provide a calculation of the expected financial benefits of a Development or Demonstration Project (not required for Research Projects). (Base Cost – Method Cost, Against Agreed Baseline).

N/A as this is a research project

Please provide an estimate of how replicable the Method is across GB in terms of the number of sites, the sort of site the Method could be applied to, or the percentage of the Network Licensees system where it could be rolled-out.

The model will be applicable to all GB Electricity Distribution Network Licensees.

Please provide an outline of the costs of rolling out the Method across GB.

There is no roll out cost as we expect the model to be available in standard software used by all Network Licensees

2c. Does Not Lead to Unnecessary Duplication ☒

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

A review of the Smarter Networks Portal has revealed projects looking at alternative cut outs and assessing cut out's suitability for the connection of LCTS but there are no projects looking at the modelling of failure modes.

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

Additional Governance Requirements
The project is innovative (ie not business as usual) and has an unproven business case where the risk warrants a limited Research, Development or Demonstration Project to demonstrate its effectiveness ☒

(i) Please identify why the project is innovative and has not been tried before.

Historically cut outs have been replaced on a fix on failure basis, however with the continually aging asset base a more targeted approach is likely to be needed in ED2

(ii) Please identify why the Network Licensee will not fund such a Project as part of its business as usual activities

The issue of an aging asset base of installed cut outs is a UK wide one and would benefit from a consistent approach. The costs of defining this approach have not been budgeted for in the ED1 submission

iii) Please identify why the Project can only be undertaken with the support of the NIA, including reference to the specific risks (eg commercial, technical, operational or regulatory) associated with the Project

This project is looking to determine if it is possible to create a statistical model to better target cut out replacements, there is a risk that the failure modes seen do not lend themselves to this approach

Has been approved by senior member of staff ☒

Additional Registration Information

Short Name

A statistical Model for Cut Out Failure Modes

Introduction

Across the UK, DNOs are faced with an aging population of cut outs in customer premises. With the rise of self-submitted meter readings, and the roll out of Smart Meters, these are no longer routinely observed by trained personnel. As such these units are currently replaced on failure when reported by customers or meter change operatives, leading to disruption and potential safety issues. This project will look to develop a statistical model on cut out failure modes to better allow DNO's to prioritise the replacement programme

Benefits

By using the statistical model to more efficiently target the replacement programme this can lead to a better utilisation of staff. In addition by using to model to drive the replacement programme there will be a safety benefit over the current fix on failure method in use currently

Technologies (Please Select one of the following)

Active Network Management	☐
Asset Management	☒
Carbon Emission Reduction Technologies	☐
Commercial	☐
Comms & IT	☐
Community Schemes	☐
Condition Monitoring	☐
Conductors	☐
Control Systems	☐
Cyber Security	☐
Demand Response	☐

Demand Side Management ☐

Distributed Generation ☐

Electric Vehicles ☐

Energy Storage ☐

Energy Storage and Demand Response ☐

Environmental ☐

Fault Current ☐

Fault Level ☐

Fault Management ☐

Harmonics ☐

Health & Safety ☐

Heat Pumps ☐

High Voltage Technology ☐

HVDC ☐

Low Carbon Generation ☐

LV & 11kV Networks ☐

Maintenance & Inspection ☐

Measurement ☐

Meshed Networks ☐

Modelling ☐

Network Automation ☐

Network Monitoring ☐

Offshore Transmission ☐

Overhead Lines ☐

Photovoltaics ☐

Pre-Heat ☐

Protection ☐

Resilience ☐

Stakeholder Engagement ☐

Substation Monitoring ☐

Substations ☐

System Security ☐

Transformers ☐

Voltage Control ☐

Gas Distribution Networks ☐

Gas Transmission Networks ☐

Electricity Transmission Networks ☐