

## NIA Project Registration and PEA Document

### Date of Submission

Dec 2014

### Project Reference

ENW1006

## Project Registration

### Project Title

Combined on-line Transformer Monitoring

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ENW1006

### Project Licensee(s)

Electricity North West

### Project Start

September 2014

### Project Duration

2 years and 1 month

### Nominated Project Contact(s)

Electricity North West Innovation Team

### Project Budget

£650,000.00

## Summary

As part of operating an efficient network operators need to maximize the use of existing assets by extending the asset life whilst maintaining system reliability and operator safety.

Electricity North West intends to trial new advanced on-line transformer monitoring solutions developed by Camlin Power consisting of a dissolved gas analysis unit combined with a partial discharge monitoring unit to make up a new suite of combined on-line monitoring tools. The project will also include the trial of Acoustic monitoring technique of the tap changers which has been developed through IFI funding through Liverpool University.

It is intended to monitor the condition of six 132kV transmission transformers that have had their usable life extended by oil regeneration and refurbishment. The units will be moved to other refurbished transformer to improve data validation and assess their conditions.

It is expected that we will be able to more accurately assess transformer health indices with collaboration with The University of Manchester and Liverpool University on data analysis. We will be able to diagnose issues as they arise, prolong the usable life of the transformers and improve operator safety by early detection and raising alarms of deterioration.

### Nominated Contact Email Address(es)

innovation@enwl.co.uk

## **Problem Being Solved**

## **Method(s)**

## **Scope**

## **Objective(s)**

It is intended to use the online PD, DGA and acoustic monitoring techniques to monitor the condition of six 132kV transformers that have had their usable life extended by oil regeneration and refurbishment. This data will allow us to develop our understanding of the effects of life extension of failure mode and maintenance requirements of assets. The monitoring suit will be moved to other refurbished units to improve data validation and assess their conditions. To fully realise the benefits of this project we will work closely with our academic partners University of Manchester and Liverpool University as well as our technology partner Camlin Power to analyse the data from condition monitoring suite to develop a more advanced transformer monitoring tools than currently exist.

## **Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)**

n/a

## **Success Criteria**

n/a

## **Project Partners and External Funding**

n/a

## **Potential for New Learning**

n/a

## **Scale of Project**

n/a

## **Geographical Area**

## **Revenue Allowed for the RIIO Settlement**

## **Indicative Total NIA Project Expenditure**

## Project Eligibility Assessment Part 1

There are slightly differing requirements for RIIO-1 and RIIO-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RIIO-2 / RIIO-1).

### Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations (Please complete sections 3.1.1 and 3.1.2 for RIIO-2 projects only)

Please answer **at least one** of the following:

#### How the Project has the potential to facilitate the energy system transition:

n/a

#### How the Project has potential to benefit consumer in vulnerable situations:

n/a

### Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

#### Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

n/a

#### Please provide a calculation of the expected benefits the Solution

n/a

#### Please provide an estimate of how replicable the Method is across GB

n/a

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

n/a

### Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 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 system 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

RIIO-2 Projects

- A specific piece of new equipment (including monitoring, control and communications systems and software)
- A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is

unproven

- A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)
- A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology
- A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution
- A specific novel commercial arrangement

## Specific Requirements 4 / 2a

**Please explain how the learning that will be generated could be used by the relevant Network Licensees**

n/a

**Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)**

n/a

- Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

**Is the default IPR position being applied?**

- Yes

**Please demonstrate how the learning from the project can be successfully disseminated to Network Licensees and other interested parties.**

**Please describe how many potential constraints or costs caused, or resulting from the imposed IPR arrangements.<**

**Please justify why the proposed IPR arrangements provide value for money for customers.**

## Project Eligibility Assessment Part 2

**Not lead to unnecessary duplication**

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

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

n/a

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

n/a

## Additional Governance And Document Upload

**Please identify why the project is innovative and has not been tried before**

n/a

**Relevant Foreground IPR**

n/a

**Data Access Details**

n/a

**Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities**

n/a

**Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project**

n/a

**This project has been approved by a senior member of staff**

Yes