

Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

## NIA Project Registration and PEA Document

### Date of Submission

Nov 2013

### Project Reference Number

NIA\_NGET0118

## Project Registration

### Project Title

Understand and Improving Condition, Performance, and Life Expectancy of Substation Assets

### Project Reference Number

NIA\_NGET0118

### Project Licensee(s)

National Grid Electricity Transmission

### Project Start

December 2013

### Project Duration

0 years and 7 months

### Nominated Project Contact(s)

Carl Johnstone

### Project Budget

£19,580.00

## Summary

When National Grid have engaged with customers, they have expressed desire for National Grid to own and operate a Transmission system that is fit for purpose. We are continually trying to reduce avoidable costs through prediction of failures, life extension and maintenance regimes. An effective condition monitoring programme to help build a reliable picture of the health of our assets, meaning existing equipment can be left in service right up until the point of failure. This review will ensure that we effectively cover all areas of the transmission system with Condition Monitoring, and do not overlook aspects.

### Nominated Contact Email Address(es)

box.NG.ETInnovation@nationalgrid.com

## Problem Being Solved

Improved condition monitoring and understanding of asset health can enable asset life extension and drive value for the end customer.

1. Understanding asset health can lead to extended life
2. Monitoring condition can lead to improved asset health

This project is going to give a GAP analysis of the existing condition monitoring innovation portfolio and identify areas for further work.

## Method(s)

### Research

National Grid are going to undertake some GAP analysis on their existing condition monitoring portfolio to identify areas where further work could deliver value.

## Scope

When National Grid have engaged with customers, they have expressed desire for National Grid to own and operate a Transmission system that is fit for purpose. We are continually trying to reduce avoidable costs through prediction of failures, life extension and maintenance regimes. An effective condition monitoring programme to help build a reliable picture of the health of our assets, meaning existing equipment can be left in service right up until the point of failure. This review will ensure that we effectively cover all areas of the transmission system with Condition Monitoring, and do not overlook aspects.

## Objective(s)

Develop a holistic condition monitoring strategy

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

n/a

## Success Criteria

Delivery of a GAP analysis of the existing Condition Monitoring innovation portfolio with recommendations for further research, development and demonstration projects.

## Project Partners and External Funding

n/a

## Potential for New Learning

n/a

## Scale of Project

This project is a strategic review. We cannot reduce the scale further if we want to provide adequate benefits to the end customers.

## Technology Readiness at Start

TRL2 Invention and Research

## Technology Readiness at End

TRL5 Pilot Scale

## Geographical Area

This project will likely be done around the Warwick area .

## Revenue Allowed for the RIIO Settlement

There has been no revenue allowed for this work in the RIIO settlement.

## Indicative Total NIA Project Expenditure

£19,580

## 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)

Condition Monitoring is a broad topic that, when applied correctly, will realise value to customers. Quantifying the benefit is difficult, as most condition monitoring techniques involve cost that is avoided. In this context, we use condition monitoring to avoid unnecessary replacement costs. However, an indicative cost of a Circuit breaker is £0.6m, a Transformer is £5m, and outages (for access to maintain the equipment) range from £10,000 / day to £1m / day (indicatively).

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

Not required - Research

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

This methodology developed will be applicable to sites where assets have reached (or are approaching) end of life, or are in high risk zones.

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

This project will deliver an analysis of the existing portfolio, and as such, will be 'rolled out' within the course of the project.

### 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 trialed 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)

As detailed in the Innovation Strategy, we are going to address challenges in the areas of:

1. Safety - Safe Working Practices
2. Reliability - Optimising Asset Management, Information Security / Knowledge
3. Environment - The environment and reducing emissions, Enhanced Capacity
4. Connections - System Access, Smarter Transmission Philosophy, Facilitating Connections
5. Customer Satisfaction / Commercial - Information Provision
6. Strategic - New Materials and Technologies

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

### Is the default IPR position being applied?

- Yes

## 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