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

Dec 2015

Project Reference Number

NIA_ENWL013

Project Registration

Project Title

Detection and prevention of formation of Islands via SCADA.

Project Reference Number

NIA_ENWL013

Project Licensee(s)

Electricity North West

Project Start

January 2016

Project Duration

2 years and 10 months

Nominated Project Contact(s)

Electricity North West Innovation Team

Project Budget

£200,000.00

Summary

The project is a proof of concept examination into the use of SCADA and ADMS as a solution to overcome the issue of island formation as a result of wider RoCoF settings.

Third Party Collaborators

WSP UK Limited

Nominated Contact Email Address(es)

innovation@enwl.co.uk

Problem Being Solved

The amount of generation connected to distribution networks at all voltage levels has steadily increased in recent years which has led to parts of the network where generation matches or exceeds demand at certain points on the load curve.
The requirements for grid connection of generators detailed in the European Network Code are currently undergoing modification which will allow the dynamic behaviour of generators and their protection and control facilities to change under certain fault conditions in order to preserve or to re-establish system security.
In addition to the EU Network Code changes there are proposed changes to the GB Distribution Code to alter the Rate of Change of Frequency (RoCoF) settings for generators from 0.125Hz/s to 1Hz/s. These wider settings help to stabilise the system from a national perspective.
The emergence of commercial measures such as Demand Side Response (DSR) contracts used to balance system frequency, trading positions and network constraints have also increased in recent years. These contracts can result in some quite significant changes to the demand profile of the distribution network.
The combination of altering settings or control on generators to allow them to remain connected for smaller system disturbances and the increase in demand and associated DSR will potentially lead to an increase in the risk of a generator supporting an islanded

network on the local distribution system.
The problem is how to reliably and economically detect when an island has formed and to determine what steps are then appropriate to take once an island has been detected.

Method(s)

The project will investigate the use of SCADA and ADMS functionality to detect and then fragment islands formed on the distribution network. If the investigation proves successful a formal DCode modification could be prepared.

Scope

The project is a proof of concept examination into the use of SCADA and ADMS as a solution to overcome the issue of island formation as a result of wider RoCoF settings.

Objective(s)

To produce a proof of concept paper and associated functional specification on the use of SCADA and ADMS to detect and fragment islands formed on the distribution network.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

This project will be considered a success upon production and publication of a proof of concept paper and associated functional specification on the use of SCADA and ADMS to detect and fragment islands formed on the distribution network. It is proposed that the outcomes of the project will be shared with industry experts and comments invited.

Project Partners and External Funding

n/a

Potential for New Learning

The project will provide an alternative method to RoCoF to detect and remove islands forming on the distribution network.

Scale of Project

The project can be applied to all areas of the Electricity North West network which is represented on the Network Management System.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

North West of England

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

200000

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)

As this is a proof of concept research project it is not possible to estimate savings at this point.

Please provide a calculation of the expected benefits the Solution

Not required as this is a research project

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

The functional specification will allow the concept to be applied to any Network Management System therefore it is replicable across all Distribution Network Licensees.

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

There is no rollout cost. The methodologies will be made available to all DNOs.

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

The project will provide a functional specification for using SCADA and ADMS to detect and fragment islands. This specification can be used by other Network Operators to apply to their own systems.

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

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.

A review of the smarter networks portal has not revealed any projects in this area.

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