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

Sep 2024

Project Reference Number

NIA_NGT0242

Project Registration

Project Title

SCADA Solutions for Hydrogen Networks (100% & Blends)

Project Reference Number

NIA_NGT0242

Project Licensee(s)

National Gas Transmission PLC

Project Start

September 2024

Project Duration

0 years and 8 months

Nominated Project Contact(s)

Alistair Carvell, box.GT.innovation@nationalgas.com

Project Budget

£198,090.00

Summary

The aim of this project is to identify if the Schneider electronics system is still the most suitable system to house the SCADA package by comparing our current as-is processes and technology against other market options. We expect this project to liaise with and benchmark potential OEMs/technologies and identify which is the most suitable for the future NGT landscape – NG, Hydrogen and Blending.

This project will explore the regulatory, policies and procedure and the legislative changes that may need to occur when changing over to hydrogen. This is for both the EEMUA 191 standard and the GS(M)R.

This project will explore the options for developing a 3D version of the SCADA system to support the established 2 dimensional versions.

Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

Problem Being Solved

A Hydrogen transmission system will require a SCADA system that is functioning for Hydrogen gas.

Currently the National Gas Transmission SCADA system is set up for a methane transmission system.

The change will predominantly be to the back-end system, with the coding changing, the logic statements used to calculate pressure rates, dew point etc, metering updates, alarm changes and responses, alarm levels and frequency of alarms, updates to legislations

such as EEMUA 191 and updates to current procedures and policies.

Method(s)

Measurement Quality Statement

The measurement approach used to meet Data Quality objectives will be through the identification of high calibre project partners who are experts in their given field. The methodology used in this project will be subject to our supplier's own ISO 9001 certified quality assurance regime and the source of data, measurement process and equipment as well as data processing will be clearly documented and verifiable. The measurements, designs and economic assessments will also be clearly documented in the relevant deliverables and final project report and made available for review.

Data Quality Statement (DQS)

The project will be delivered under the NIA framework in line with the agreed Energy Networks Innovation Process document and NGT internal policies. Data produced as part of this project will be subject to quality assurance to ensure that the information produced with each deliverable is accurate to the best of our knowledge and sources of information are appropriately documented. All deliverables and project outputs will be stored on our internal SharePoint platform ensuring backup and version management. Relevant project documentation and reports will also be made available on the ENA Smarter Networks Portal and dissemination material will be shared with the relevant stakeholders.

Scope

The scope and objectives of the Project should be clearly defined including the net benefits for consumers (eg financial, environmental, etc). This section should also detail the financial benefits which would directly accrue to the GB Gas Transportation System and/or electricity transmission or distribution.

Objective(s)

The aim of this project is to identify if the Schneider electronics system is still the most suitable system to house the SCADA package by comparing our current as-is processes and technology against other market options. We expect this project to liaise with and benchmark potential OEMs/technologies and identify which is the most suitable for the future NGT landscape – NG, Hydrogen and Blending.

This project will explore the regulatory, policies and procedure and the legislative changes that may need to occur when changing over to hydrogen. This is for both the EEMUA 191 standard and the GS(M)R. This project will explore the options for developing a 3-dimensional version of the SCADA system to support the established 2-dimensional versions.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

An assessment of distributional impacts (technical, financial and wellbeing related) for this project has been carried out using a bespoke assessment tool, which assesses the project as having a positive, negative or neutral effect on consumers in vulnerable situations. To help inform the assessment, this tool considers the categories of consumers identified in the Priority Services Register. This project has been assessed as having a neutral impact on customers in vulnerable situations. This is because it is a transmission project.

Success Criteria

Completion of detailed supplier matrix including comparison of current SCADA capabilities and limitations compared with other suppliers and recommendations of which SCADA package to choose .

A full report issued to NGT, included are cost benefit analysis of site agreed with supplier, supplier matrix as detailed above, possibilities of 3D representations of SCADA systems and documentation of any and all legislation's which may require changing.

Project Partners and External Funding

ITI Group are the project partner.

Potential for New Learning

Potential to understand if there is an industry standard for the SCADA systems coding language and if NGT uses non industry standards. If those standard coding languages will work with creating 3D representations of the NGT sites.

Understanding whether the current SCADA package is the most cost effective to use system wide, as opposed to different SCADA systems at different sites.

Scale of Project

Due to this being a research project the scale is quite small. If this works then the next step would be to design a system and implement it at a non-operational site and then at an operational site. If this is successful then there will be evidence to scale it up for the whole of the NGT.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

The project is a research project but will look at Wormington Compressor site for a cost benefit analysis of potential changing the SCADA system.

Revenue Allowed for the RIIO Settlement

This is a desktop research project as such there is no revenue.

Indicative Total NIA Project Expenditure

Supplier fees – Work package 1 - £50,691

Work package 2 - £42,987

Work package 3 - £41,274

Work package 4 - £13,616

Total - £148,568

Internal fees - £49,522.67

Total cost - £198,090.67

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:

With the transition to Net Zero, the SCADA system will require at least an update. This project investigates what will need to be changed, such as more or less alarms, coding requirements, if new mimics (front end) will need to be created to ease this transition. Without a successful SCADA system then NGT cannot telemeter data from their sites to GNCC and actively control them correctly.

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

This is a research project as such is not applicable.

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

Initially this cannot be rolled out due to it being a research project, the next phase, if this is successful, is to design and implement a version of the SCADA system to see how it works with both non-operational and operational requirements. After initial testing at both non-operational and an operational site this could be rolled out to all sites on NGT.

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

Initial estimate of rolling this out to all sites would be above £150mil, however this is an estimate based off of National Grids SCADA system, to have a direct quote, NGT would first need to decide if who the SCADA supplier will be. This report will give an idea of the cost to roll out a brand-new SCADA supplier or to stay with the current one.

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 learning from the SCADA system can be used by Standard Special Condition A11, as this requires “the efficient and economic operation of the pipe-line system to which this licence relates” which the understanding of a Hydrogen SCADA system will help to keep the efficient operation of the pipeline by the GNCC.

A 3D representation of sites on the SCADA system would also be used by Special Condition 9.5 specifically for NGT, digitalisation. Having this will support NGT digitalisation plan.

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

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.

The project proposal has been shared with the gas industry to avoid duplication. There will be no duplication of activities done as part of this program. This project will address a gap in National Gas’ ongoing innovation work looking at hydrogen transportation and enabling work to support the energy transition.

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

This is innovative due to the wide suppliers of SCADA systems either at GNCC, SCADA, and site wide. To make them all coherent under one supplier has not been thought of or tried before. This will also allow for the SCADA system to work for hydrogen blends and 100% Hydrogen transmission. It is also innovative due to there not being a 3D representation of the sites specifically designed for SCADA and the alarm areas.

Relevant Foreground IPR

Details of expected Relevant Foreground IPR which will be generated in the Project. If applicable, this must also explain if Background IPR will be required to use the Relevant Foreground IPR.

Data Access Details

Data from Wormington compressor site will be needed to show what instruments are currently on the compressor site. This information will not need to be specific instruments but needs to be a holistic overview of what instruments the site has so that an effective cost benefit analysis can be completed.

Details on how network or consumption data arising in the course of an NIA funded project can be requested by interested parties, and the terms on which such data will be made available by National Gas can be found in our publicly available "Data sharing policy relating to NIA projects" at www.nationalgas.com/gasinnovation. National Gas data access is managed IAW provisions under 2.15-2.18 for the current NIA Governance Document.

National Gas already publishes much of the data arising from our NIA projects at www.smarternetworks.org. You may wish to check this website before making an application under this policy, in case the data which you are seeking has already been published.

Data Quality Statement (DQS):

The project will be delivered under the NIA framework in line with the agreed Energy Networks Innovation Process document NGT internal policies. Data produced as part of this project will be subject to quality assurance to ensure that the information produced with each deliverable is accurate to the best of our knowledge and sources of information are appropriately documented. All deliverables and project outputs will be stored on our internal SharePoint platform ensuring backup and version management. Relevant project documentation and reports will also be made available on the ENA Smarter Networks Portal and dissemination material will be shared with the relevant stakeholders.

Measurement Quality Statement (MQS):

The methodology used in this project will be subject to our supplier's own ISO 9001 certified quality assurance regime and the source of data, measurement process and equipment as well as data processing will be clearly documented and verifiable. The measurements, designs and economic assessments will also be clearly documented in the relevant deliverables and final project report and made available for review.

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

National Gas Transmission are not funded for Hydrogen related projects through business as usual funding, and so this project must be funded through the Network Innovation Allowance.

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

Funding this project through NIA gives an opportunity to share the findings with other network licensees to enable their own progression of hydrogen transportation related activities.

This project has been approved by a senior member of staff

☑ Yes