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

Jul 2017

Project Reference Number

NIA_CAD0006

Project Registration

Project Title

Remote Asset Vibration Monitoring

Project Reference Number

NIA_CAD0006

Project Licensee(s)

Cadent

Project Start

July 2017

Project Duration

0 years and 4 months

Nominated Project Contact(s)

Eithne Allen

Project Budget

£64,500.00

Summary

This research project will identify suitable technologies to monitor vibration at key operational sites (e.g. critical offtakes). These technologies could enable real time monitoring and potentially predictive capabilities. A future phase would be required to trial the effectiveness of the selected technologies identified within this project.

Currently there is no real time monitoring of vibration and its effects or predictive analytics.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

Cadents' Gas Distribution high pressure Network is comprised of circa 50 offtakes and circa 700 Pressure Reduction Stations (PRS) geographically dispersed - that serve 11 million customers.

Increased flow rates during high demand periods induce vibration in the network components. This vibration has been acknowledged as the source of some system failures.

Previous technical studies (DNVGL – Vibration Study/survey 2006) have informed our current approach to conduct prioritised proactive remedial work. However there is an opportunity to move to real time condition monitoring to inform the operating strategy for individual key sites.

This will:

- Reduce operational risk of the system
- Reduce overall wear of key components
- Prevent system moving to failure mode

- Improved visibility of station performance

Method(s)

The MTC will conduct research work to identify a range of suitable equipment to be installed on offtakes stations. MTC will also develop corresponding hardware/software solutions to manage data transmission to a central portal.

The equipment identified (sensor, protection device, controller, transmitter, receiver and software solution for data visualisation) will be ranked against key operational conditions such as:

-Physicality of pipework architecture

-Range of operational conditions i.e. flow, temperature and hazardous areas

-Test specification for the selected equipment.

- Cost model (lifecycle cost).

Scope

This research project will identify suitable technologies to monitor vibration at key operational sites (e.g. critical offtakes). These technologies could enable real time monitoring and potentially predictive capabilities. A future phase would be required to trial the effectiveness of the selected technologies identified within this project.

Currently there is no real time monitoring of vibration and its effects or predictive analytics.

Objective(s)

Establish an effective vibration monitoring system on key assets that cover the full range of operational conditions:

Specifically

- Identified range of suitable equipment ready to trial on selected sites.
- Design a scalable system architecture to allow data collection analysis and visualisation
- Establish cost benefit model for installation of vibration monitoring systems across all suitable assets

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- Identified a suitable range of equipment compatible with a range of pipework architecture
- Scalable cost efficient model identified
- Compliant (gas industry standards) and scalable system architecture to support data collection analysis and visualisation

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This project is a 3 month study into suitable technology and has the potential to lead to further phases e.g. trial of technology on the gas Network.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The proposed works will be undertaken in Cadent's offices in Hinckley and MTC's premises in Coventry.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£49,500 total external spend (including contingency), payable to the MTC.

Total Cadent NIA Spend (including Internals and contingency) £64,500 (External - £45,000, Contingency - £4,500, Internals- £15,000)

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 as this is a research project.

Please provide a calculation of the expected benefits the Solution

Not required for Phase 1.

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

Identified range of suitable equipment ready to trial on selected sites

Design a scalable system architecture to allow data collection analysis and visualisation

Establish cost benefit model for installation of vibration monitoring across all assets.

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.

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