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NIA Project Registration and PEA Document

Date of Submission

Aug 2020

Project Reference Number

NIA_WWU_65

Project Registration

Project Title

Odorant Monitoring

Project Reference Number

NIA_WWU_65

Project Licensee(s)

Wales & West Utilities

Project Start

August 2020

Project Duration

0 years and 8 months

Nominated Project Contact(s)

Catherine Lister

Project Budget

£89,333.00

Summary

A project to assess a remote monitoring system which continuously monitors odorant concentration within the gas.

Nominated Contact Email Address(es)

innovation@wwutilities.co.uk

Problem Being Solved

Natural gas is odourless so, for safety purposes, odorants are added to give it the familiar gas smell. According to current legislation (the Gas Safety Management Regulations 1996 – GSMR, the Pipeline Safety Regulations 1996 - PSR), the presence of natural gas at 1% in air must be detected by smell.

To ensure an adequate level of odorant in the gas, GDN's must carry out periodic checks of concentration, with gas chromatographs or with rhino analytical methods. Typically, these checks take place monthly. Rhinologists on the network can sometimes report low or no odour at the extremities of the network, which can result in the injection of twice as much odorant compared to other Offtakes. There are many reasons why this could be the case, for example unusual pipe configuration, as the gas splits to feed two different systems but it's currently not possible to continually check the concentration and see where there is odorant or not.

Method(s)

As an alternative to current measurement techniques, a remote monitoring system called Spectra which, by means of spectrographic analysis, allows networks to continuously monitor the value of odorant concentration. The Spectra system is also capable of providing the concentration of other gas components, such as benzene which gives advantages in terms of safety and environmental protection. The system reports to specially developed software called WebPressure or can be incorporated into existing Scada systems, as this is a trail of the system Wales & West Utilities will be using WebPressure.

The project will install two devices at Waun Fawr Aberystwyth and Wem PRS, these will be monitored for three months with comparative tests against existing equipment to prove that the system works. The project will enable us to understand that the levels of odorant are sufficient in the network & if possible reduce odorant levels being injected to the network

The installation of a Spectra directly at the injection point (Maelor Offtake) does not give information on the concentration level actually present on the network, but rather tells us whether the injection is taking place or not and the level of concentration during the injection. To analyse the effectiveness of this injection two Spectra units will be installed on the mid system, at Wem and Aberystwyth. Assuming injection activities are operating as normal during this trial, the data collected at the proposed locations will give Wales & West Utilities a strong indication that odorant is reaching all areas of the mid system.

Scope

Site Selection

- Site inspection
- Definition of the materials and details of the installation Technical drawings of the installation with approval from Wales & West Utilities

Installation

- Installation of 2 Spectra system

Trial

- First configuration of system
- Monitoring of the measurement and possibly reconfiguration of the parameters
- Comparative test with gas chromatograph
- Final report

Objective(s)

To trial two Spectre systems to help Wales & West Utilities understand if this product could help reduce the amount of odorant injected into the network.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

A successful project will see the installation of two Spectre units, with a detailed report on the benefits of the system.

Project Partners and External Funding

Project Partners: Cathodic Protection Co. Ltd and Automa SRL. The project will be fully funded via the NIA.

Potential for New Learning

It's currently not possible to continually check the concentration of odorant in the network, this project will allow us to demonstrate that this is possible and the benefits in doing so. As the Spectra system is also capable of providing the concentration of other gas components, such as benzene, there is potential for safety benefits also.

Scale of Project

The project will install two units on the Wales and West network, under field trial conditions.

Technology Readiness at Start

TRL7 Inactive Commissioning

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

Within the Wales & West Utilities network

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External Spend: £67,000

Internal Spend: £22,333

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)

If an offtake set to 15mg/m³ due to issues within the network, could be reduced to 6mg/m³ there is a potential saving of roughly £50k per year.

Please provide a calculation of the expected benefits the Solution

Base Cost

Cost of odorant per mg/m³ = £8.58

Use at site A = 15mg/m³ x 618scm = 9270kg

Cost of odorant per year = £8.58 x 9270kg = £79,536.60

Method Cost

Cost of odorant per mg/m³ = £8.58

Reduction to 6mg/m³ = 6mg/m³ x 618scm = 3708kg

Cost of odorant per year = £8.58 x 3708kg = £31,814.64

Base cost – Method Cost = £47,721.96

Cost of equipment (x2) = £54k

Cost of installation = £2.5k

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

The method should be replicable across the entire gas industry, installation costs may vary depending on site layout however. Wales & West Utilities have seventeen offtakes where this product could be installed.

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

Wales & West Utilities have 17 sites across our network. To install a system at each offtake and at the midpoint would cost £918,000. Each network will have varying amounts of offtakes on their network, but this is a guide at the cost of rollout.

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

All networks are required to follow The Gas Safety (Management) Regulations 1996 therefore the learning generated from the project will be applicable to all networks. The system has the potential to have a direct impact on the network by reducing the levels of odorant that are currently installed, provide analysis and measurement of harmful volatile organic compounds.

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 search of the Smarter Networks Portal has confirmed there is no duplication

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

A system like this has never been used in the UK. Currently a team of rhinologists travel to a number of primary and secondary sample points around the network to sniff the gas and ensure the correct amount of odorant is present against the Sales Scale standard. If a

low or high odorants level is detected a team of three people will go out to sniff the gas and see if they all concur, at the same time a sample of gas is taken and sent to an external company for analysis. This system will allow Wales & West Utilities to monitor the odorant. The new system would be able to monitor the amount of odorants in the gas several times a day, although this would not remove the need for Rhinologists straight away it would give a clearer picture of odorant usage and give confidence that the odorant is being injected correctly at the Offtakes. It would also negate the need to take a sample of gas to be analysed, which can be quite costly and due to transportation times and sample degradation this may not be accurate.

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

This project did not form part of the RIIO GD1. It requires funding outside of this.

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

This is a brand new piece of equipment that has never been used on the gas network in Great Britain, there is uncertainty if the system has the capability to replace the current methods of odorant monitoring.

This project has been approved by a senior member of staff

Yes