NIA Project Registration and PEA Document

Date of Submission

Oct 2015

Project Reference Number

NIA_NGN_109

Project Registration

Project Title

Gas Detection Dogs

Project Reference Number

NIA_NGN_109

Project Licensee(s)

Northern Gas Networks

Project Start

October 2015

Project Duration

0 years and 7 months

Nominated Project Contact(s)

Gary Tupper

Project Budget

£5,194.00

Summary

DNV GL will provide five dilutions of the target scent, in liquid form. The trial will be designed around a series of simple tests to evaluate whether a dog can detect quantities much smaller than that found in natural gas systems. An example of the tests are listed below:

Droplet Tests

The test will be made up of a series of droplet tests where the target scent is applied to a piece of apparatus at varied quantities and at varied concentrations. The trial will also use placebos (apparatus with no target scent added) and other distractions to test if the dog will try and indicate a false positive in order to try and get a reward. Each piece of apparatus will have a unique identifier and risk of cross contamination will be strictly monitored.

Source Test

GPS will also be used in the trial to tag a location where the point of highest concentration has been applied. This position can then be compared to where the dog indicates (i.e. has he found the source). .

Third Party Collaborators

BK Integrity Ltd

Dog Detectives (UK)

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

Leakage detection, pipeline or asset condition compliance methods in the GB have remained, predominantly, unchanged for decades. No disruptive innovation has ever been introduced to this highly critical area due to the very nature of our risk averse environment and regulatory nature of the energy sector. Disruptive innovation, by its very nature, challenges our concepts on how processes are carried out and engineers previously relied on proven technology to provide evidence for action.

Dogs are used in many sectors, Police, UK Border Agency, Fire & Rescue, Health, Environment and well as guiding the blind and assisting those with poor hearing. In all these cases they have been proven to improve detection rates and provide valuable payback to all who have come to rely on their valuable skills. Dogs have an acute sense of smell, and can be trained to detect low concentrations of vapour, accordingly, they could offer a pipeline leak detection and location capability to pipeline operators. In addition, they could also provide Networks with a unique service, currently unavailable, across a wide range of activities, including stakeholder engagement.

Technology remains the major catalyst for change in the gas industry, but sometimes human innovation is nowhere near as efficient as nature. Whilst the idea may seem odd, we are convinced this would have been the same reaction before dogs where introduced to those industries mentioned above.

Without a significant investment in research, development and a detailed demonstration trial, GDN's would never be in a position to validate, in GB, whether dogs could add value to our processes.

Method(s)

It is proposed to first undertake a low risk feasibility study to confirm if it is worth progressing into a more detailed project. Natural gas is odourless and the domestic gas supply is dosed with mercaptan to assist in leak detection. This additive contains sulphur and is detectable in very small quantities.

If the feasibility study proves successful, a further project would be established looking to train and use dogs for a wide range of gas network activities.

Scope

DNV GL will provide five dilutions of the target scent, in liquid form. The trial will be designed around a series of simple tests to evaluate whether a dog can detect quantities much smaller than that found in natural gas systems. An example of the tests are listed below:

Droplet Tests

The test will be made up of a series of droplet tests where the target scent is applied to a piece of apparatus at varied quantities and at varied concentrations. The trial will also use placebos (apparatus with no target scent added) and other distractions to test if the dog will try and indicate a false positive in order to try and get a reward. Each piece of apparatus will have a unique identifier and risk of cross contamination will be strictly monitored.

Source Test

GPS will also be used in the trial to tag a location where the point of highest concentration has been applied. This position can then be compared to where the dog indicates (i.e. has he found the source). .

Objective(s)

The objective of this work is to:

1 Confirm a dog can be trained to detect the odour that is added to domestic natural gas systems.

2 Determine whether a dog can detect the odour at a concentration equal to the level added to domestic natural gas systems.

3 Evaluate whether a dog can detect quantities of the odour which is significantly less than that found in domestic natural gas systems.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

1 Confirmation the dogs can be trained to detect the odour that is added to domestic natural gas systems

2 Confirmation a dog can detect the odour at a concentration equal to the level added to domestic natural gas systems.

3 Confirmation a dog can detect quantities of the odour which is significantly less than that found in domestic natural gas systems.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This project requires a single trained dog to undergo "Scent Training" to demonstrate the feasibility and provide confidence, via a preliminary inspections, that a dog can be calibrated adequately to detect natural gas. The short duration test over a number of days is designed to confirm whether it can pinpoint sources of leaks.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL5 Pilot Scale

Geographical Area

The training of the dog will take place at gas detections dogs at their training grounds in Moreton, Wirral,

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External Costs £3,900

Internal Costs £1294

Total Cost = £5194

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 this project proves that dogs can accurately detect the smell of gas, future projects will seek to prove whether or not dogs can be used as an alternative method of locating gas escapes.

Please provide a calculation of the expected benefits the Solution

N/A - Research Project

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

If this proves to be successful further stages could see this replicated across all UK GDNs.

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

This initial project is a research project to determine whether or not dogs can detect the smell of gas, further projects will demonstrate the cost of training a dog to detect gas leaks and provide us with a definitive cost of roll out across GB.

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

☐ 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 outcome of this feasibility project will be prove whether or not dogs can detect the smell of gas, further studies will then prove whether or not dogs can be used as alternative method for gas leakage detection.

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