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

Nov 2019

Project Reference Number

NIA_SGN0161

Project Registration

Project Title

Advanced Gas Detector Implementation Trial (AGD-IT)

Project Reference Number

NIA_SGN0161

Project Licensee(s)

SGN

Project Start

December 2019

Project Duration

0 years and 6 months

Nominated Project Contact(s)

Hec Salgado

Project Budget

£39,324.00

Summary

SGN currently use three primary types of gas detection equipment across its three networks, Gascoseekers, Gastechs and Gas surveyors. The units are predominately used by First Call Operatives (FCOs) when attending a reported gas escape, and subsequently the engineering teams throughout the repair process. The unit's involvement in the detection process is critical in providing pinpoint readings of the levels of methane present; allowing the operative to identify the source of the leak and determine the risk score and category of the escape. The result of the investigation is manually recorded by the operative on to a Leakage Investigation Sheet (LIS), which allows continuous site monitoring.

The previous NIA funded project (NIA-SGN0064) was ambitious in its scope in trying to connect the various elements to the gas detection equipment. The clear outcome of this project was to identify the great potential and versatility of the GS700 gas detection equipment. Because the previous 3 trials, this machine had been linked to other elements (calibration station, tablet and cloud application), it was not viable for the equipment to be approved for use on the network.

There is still a need to have a versatile, modular unit that can;

· Determine the presence of carbon monoxide (CO).

· Determine the presence of Oxygen (O2).

· Verify new Infrared detector is in compliance with SGN's standards (INQ3 and INQ4).

· Utilise rechargeable batteries

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

SGN currently use three primary types of gas detection equipment across its three networks, Gascoseekers, Gastechs and Gas surveyors. The units are predominately used by First Call Operatives (FCOs) when attending a reported gas escape, and

subsequently the engineering teams throughout the repair process. The unit's involvement in the detection process is critical in providing pinpoint readings of the levels of methane present; allowing the operative to identify the source of the leak and determine the risk score and category of the escape. The result of the investigation is manually recorded by the operative on to a Leakage Investigation Sheet (LIS), which allows continuous site monitoring.

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Method(s)

As in the previous 3 trials, SGN will work with GMI to define the design of the gas detector. The reason the same spec. cannot be used as previously is because there were elements of complexity that were introduced previously, which if present again would likely add complexity to the field trial without any additional benefit. In addition, a new Infrared (IR) sensor was introduced during Trial 3 which will also be utilised during this trial. It has many advantages such greater reading stability and its seen as a valuable addition to this instrument.

There are two builds proposed for these instruments that would have different sensors, as the machine is modular in concept and design, allowing the user to choose the arrangement;

- Build 1; Vol gas, LEL

- Build 2; ppm, Vol gas, LEL, CO & O2.

The rational behind the 2 builds is that it will enable the business to have 2m different units depending on where these are needed, such as emergencies and escapes or replacement activities.

Scope

The Project will be broken down into the following sections:

· · GS700 scoping and expansion – this will involve defining the 2 gas detector builds, as well as developing the charging base and a carrying out the testing for battery longevity and ease of vehicle installation.

· Development of training materials and laboratory testing by GMI will proceed in parallel

· DNV GL to review and evaluate GS700 gas measurement and response time data supplied by GMI / GasPTS

· Development of field trial process documentation and success criteria (G/23 field trial procedure)

· Live trials on SGN's network both in Scotland and South over 3 to 4 depot locations.

The data produced, and operative feedback can be used to review the field trial against success criteria.

Objective(s)

The objectives of the project are to produce a portable gas detection device to detect methane, CO , O2 and have the capability of being charged from the vehicle.

Summary of Work Required

· Develop a working prototype of the gas detection device to meet relevant industry standards and specifications.

· Develop work procedures for using the product.

· Trial the solution across SGN's networks.

Commercial appraisal for the overall use of the product and potential efficiency savings resulting from the success of the field trial.
Continued protection of SGNs Intellectual Property

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The success criteria for the project are:

- Carry out scoping for the 2 instrument builds.
- Complete the manufacture of 12 prototypes, 6 of each build to meet the relevant industry and SGN standards and specifications.
- Development of in-vehicle charging platform that will enable easy transfer within vehicles.
- Development of an associated training package for field trial.
- Undertake field trials across SGN's Scotland and South networks.
- Produce operator guidelines detailing the correct operating procedure of the equipment.

Project Partners and External Funding

Gas Measurement Instruments (GMI)
Technical Service Provider; DNV-GL

Potential for New Learning

It is expected that this project will provide an opportunity for GDNs to gain a better understanding of the existing technology that relates to the detection of methane and various gases (CO and O2). The development this rechargeable prototype will provide learning on the functionality and applicability of the existing technology. Also, the flexibility of this unit for vehicle transferability. In addition, it will enable the new IR sensor to be validated in a network environment. Learning will be disseminated by providing training and by the final report at the end of the project.

Scale of Project

To ensure that learning associated with this project is maximised and that the future application of this technology is well understood, it is necessary to trial this new technology across several processes and SGN's geographical area. The trial will take place in network locations in Scotland and South England, to assess the various parameters of interest over different types of network and different geographical areas.

Technology Readiness at Start

TRL7 Inactive Commissioning

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

This project will be trialed in network locations in both Scotland and South England.

Revenue Allowed for the RIIO Settlement

None.

Indicative Total NIA Project Expenditure

The project is to be wholly NIA funded with a budget of £39,324.

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)

It is difficult to asses direct impact.Tthere will be savings as shown in the CBA. There will be an environmental impact in the savings in conventional batteries as the unit is rechargable.

Please provide a calculation of the expected benefits the Solution

Please review the CBA above.

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

Other GDNs would have the opportunity to purchase this equipment.

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

NA - it would depend of each GDNs replacement startegy.

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 will be used to develop a unit that can determine the levels of CO, O2 and methane. If successful, this will enable GDNs to deploy technicians with reduced risk, increased efficiency and will provide more reliable data. The unit will also be rechargeable. Once verified, this unit will be available for use by all GDNs to improve response to gas leaks.

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

To provide an advanced gas detector which is rechargeable and can detect various gases and has been proved and validated on SGN's network.

☑ 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.

This project is not duplicated across the GDNs.

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 the final phase of the Advanced Gas Detection project which has not been tried by other GDs.This will seek to gather the necessary data for approval o9f the unit on the Network.

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 fits in within the framework of NIA.

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 AGD-IT project has small cost that could be funded by the network. However, it was decided to use NIA funding as it complies with the current framework of NIA.

This project has been approved by a senior member of staff

☑ Yes