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 2015

Project Reference Number

NIA_SGN0088

Project Registration

Project Title

Advanced Mini Bag Kit

Project Reference Number

NIA_SGN0088

Project Licensee(s)

SGN

Project Start

January 2016

Project Duration

1 year and 1 month

Nominated Project Contact(s)

Hector Salgado

Project Budget

£90,250.00

Summary

The scope of this project is to produce an Advanced Mini Bag Kit to facilitate the exchange of ECV's, whilst removing the need to excavate and physical isolate the gas service. The design and production of a "user friendly", lightweight "no blow" solution for semi-concealed and historic ECV's ensuring GDN's environmental impact is being is reduced.

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

An Emergency Control Valve (ECV) is a safety mechanism on a gas service pipe connecting a gas meter to the gas mains. Every gas pipe installation and meter should have one. The ECV is situated where the gas network pipe meets the gas meter. Its purpose is to control the flow of gas where it should be switched off in the event of an emergency / gas escape, or where there is no gas meter installation already in place.

In the scenario that a gas engineer is required to isolate the gas connection for either routine or non-routine maintenance, the ECV will be closed. Due to the design and more specifically age of installed ECV's, either, it may not be possible to completely close the valve as a result of internal debris or the seal may have perished. This is deemed an "uncontrolled" leak and the gas engineer working needs to immediately replace the valve.

To replace the leaking ECV, equipment has been designed to be inserted through the valve to isolate the flow of gas. The ECV can then be removed and a new one replaced, all achieved with no gas leaking.

Semi-concealed ECV's incorporate a 90°bend within the fitting and the majority of historic ECV's do not have an opening with a circular profile. Equipment currently in use does not have the capability to be inserted through the semi-concealed ECV. For historic ECV's, the inertial opening may not be circular, this them makes is difficult to remove the flow stopping tool and can damage it. This then results in a much larger operation being carried out to replace the ECV.

Currently to replace semi-concealed ECV's, it is required that the gas engineer calls out a team to excavate the service line and perform a squeeze off to isolate the flow of gas. It is at this point that the ECV can be replaced safely. This additional work introduces a significant cost due to an increased number of engineers on site and an excavation required increasing in the environmental impact.

It has also been identified that during the role out of smart meters, reports of uncontrolled leakage from the older style ECV's will significantly increase presenting a substantial demand on resource if current repair techniques are employed.

The proposed project will enable the replacement of the semi-concealed ECV's to be converted to a single man operation.

Method(s)

It has been identified that a Mini Bag Assembly is required to pass through and isolate all approved ECV's including the two existing semi-concealed ECV's of which consist of a body which has a 90° bend on the inlet. This will enable replacement under live gas conditions, eliminating the need for any excavation to be carried out and a repair team to be used during the replacement process. The equipment will be specified for insertion through all low pressure ECV's from ¾" to 2" including non-full bored tapered plug ECV's.

This will achieved through the project breakdown as listed below:

- Design-work & production of initial drawing pack for approval by SGN
- Production of working model (subject to SGN approval)
- Design updates and production of final drawing pack
- Demonstration of prototype tests and written approval from SGN to commence batch manufacture
- Production of trial units
- Pre-deployment risk and technical assessment
- Development and provision of Advanced Mini Bag Kit for field trial.
- Field trial of equipment across network
- Documentation upon completion
- Training
- Commercial appraisal of the most suitable operating model.
- Quantification of anticipated cost benefit.
- Project Management within approved parameters.
- Project report.

Scope

The scope of this project is to produce an Advanced Mini Bag Kit to facilitate the exchange of ECV's, whilst removing the need to excavate and physical isolate the gas service. The design and production of a "user friendly", lightweight "no blow" solution for semi-concealed and historic ECV's ensuring GDN's environmental impact is being is reduced.

Objective(s)

The objectives of the project are to produce a kit for ECV exchange enabling:

- Single Gas Engineer operation.
- Easy operation within restricted working areas.
- A "gas free" operation.
- Isolation of approved low pressure ECV's straight and semi-concealed (angled) valves

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The success criteria for the Project are to evaluate and test the mini bag kit against conventional repair techniques and compare the performance in terms of:

- Development of a working prototype
- Carry out field trials of the developed product to test functionality
- Evaluate performance versus conventional techniques

- Produce detailed final report including test results from the field trial
- Disseminate information and project outcomes

Project Partners and External Funding

None

Potential for New Learning

The successful completion of this project will provide all GB Network Licensees with an understanding of the benefits of introducing equipment to exchange all types of domestic ECV's in to business as usual activities.

The outputs of the project will be detailed in a final project report which will be available to other network licensees once published on the Smarter networks Portal.

Scale of Project

The project will focus predominantly on product development and workshop testing to evaluate the suitability of the tooling in various circumstances. Field trials will be required to confirm the initial findings and suitability of the product developed. These will be carried out across SGN's three networks to ensure the equipment is tested in a variety of environments.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The project will take place within SGN's operational footprint.

Revenue Allowed for the RIIO Settlement

SGN's RIIO Allowance for Repair activities is £243.7m. If the project is successful and provides an alternative solution it is likely that there could, potentially, be a reduction in the repair expenditure. It is envisaged this would be down to material costs and, potentially, excavation sizes. This project represents an opportunity to assist with this policy and to potentially out perform in respect to this allowance

Indicative Total NIA Project Expenditure

The total project expenditure will be £90,250, 90% of which is allowable NIA expenditure (£81,250)

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)

The estimated savings that could be achieved through the development and utilisation of the equipment for the replacement semi-concealed and historic ECV replacements due to gas escapes reported and smart meter installation would approximately £190 per job depending on time of operations.

Please provide a calculation of the expected benefits the Solution

During the financial year of 2014/15 a total of approximately 6660 ECV's were exchanged. It was determined that 1665 were semi concealed exchanges and a further 1998 were of the historic design, of which both types required excavation works. These figures are expected to increase throughout RIIO-GD1 as a result of the continued roll out of smart meters.

The approximate average cost of carrying out a repair is £235 and £378, depending on normal/overtime operating costs. On average the split between normal time and overtime operations for this repair method is 65%/35% respectively. As such the following calculations can be determined:

	Normal Time	Overtime	Sum
Base	£557,200	£485,700	£1,042,900
Method	£183,400	£173,300	£359,700
Difference	£373,800	£309,400	£683,200

Through eliminating the need to use the both a repair team and to excavate the following savings have been concluded per job. On average this is between a 64-67% saved per job.

If it is assumed that the potential benefit across GB can be calculated using a 4:2:1:1 split amongst the GB GDN's then the potential saving across GB could be approximately £2.5m per annum.

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

This process would be transferable across all network licensees.

The potential outcomes of this project are replicable across GB. Using the 4:2:1:1 ratio and SGN's current numbers of semi-concealed and historic ECV replacements due to gas escapes reported and smart meter installation it can be assumed that there are approximately 14600 jobs across GB where this innovative technology could potentially be utilised.

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

Excluding the cost of purchasing the equipment, it is anticipated that the cost of disseminating the development outcomes and findings from the project and training costs incurred before the products can be used would be approximately £10,000 for SGN. Using the 4:2:1:1 split with reference to the size of the networks, It could be assumed that National Grid's training costs would be approximately £20,000, and Wales & West Utilities', and Northern Gas Networks' would be £5,000 each. Therefore, the estimated total cost of training would be £40,000.

This figure includes three training courses for 12 people for each Network Licensee in three separate locations across their network with an allowance for travel included, and approximate costs for one practical demonstration by SGN for representatives from each Network. It is anticipated that each Licensee would have their internal training carried after an initial training program to a selective proportion of their workforce.

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 Network Licensees will be able to use the learning from this project as the outputs will be presented in a clearly defined report that will be available to them on the smarter networks portal, allowing the network licensees to make informed choices as to whether to invest in this technology.

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 review of all other Network Licensees Innovation Funding Incentive Annual Reports and NIA portfolios has been performed and no similar projects have been identified.

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