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

Dec 2016

Project Reference Number

NIA_NGN_191

Project Registration

Project Title

Practical Solution for Overbuilds

Project Reference Number

NIA_NGN_191

Project Licensee(s)

Northern Gas Networks

Project Start

December 2016

Project Duration

1 year and 1 month

Nominated Project Contact(s)

Neil Travers

Project Budget

£130,667.00

Summary

This project is to work in partnership between SVI and Northern Gas Networks to design, develop and demonstrate a suitable method for sealing the annular space between the inserted PE gas pipe and the old metallic gas main.

The purpose of the project is to remove the risk to 'overbuilt' properties by designing and developing a system and all associated technology to enable a Steve Vick International (SVI) Contracting Team to fully fill the annular space between the two pipes beneath the entire width/length of the building residing above the metallic gas main.

The developed system will require G23 status and enter a period of field trials whereupon a set number of installations will be carried out on a range of pipe diameters and lengths.

The project team will monitor progress throughout this period and undertake feedback from all interested parties.

Once the system is installed, the abandoned annular space will be monitored by NGN for gas build up via a standpipe and valve assembly or other suitable means, attached to the injection point of the sealant. The valve will terminate at an accessible location of NGN's choosing.

Third Party Collaborators

Steve Vick International Ltd

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

A current problem found throughout the UK gas distribution networks (GDNs) is when a metallic gas main has been 'Live Inserted'

using a new PE pipe but the metallic gas main runs beneath existing buildings.

It is not common practice to 'Live Insert' gas mains that are under buildings but sometimes this is unavoidable and in some cases buildings are built over the gas main after it has been 'Live Inserted'.

In both cases the annular space between the new PE and the old metallic main has the potential to be a gas carrying leak path beneath the property which if ignored will be putting members of the public at greater risk of gas leaking into properties and potentially fires and explosions.

Method(s)

The Annular Space Abandonment system will be developed by SVI and will require a number of in-house tests on different pipe diameter combinations to be carried out at SVI headquarters in Bradford on Avon.

The testing will be witnessed by a NGN representative/project member and a full technical report detailing the project and its development will be produced by SVI.

Scope

This project is to work in partnership between SVI and Northern Gas Networks to design, develop and demonstrate a suitable method for sealing the annular space between the inserted PE gas pipe and the old metallic gas main.

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Objective(s)

Design & Development (In-house) - SVI Design Engineers and Technical teams to design, develop and in-house test the following prototypes:

Annulus entry systems – More than one method for gaining entry and injecting annular sealant into the metallic main will be designed to allow for several work scenarios.

Sealant injection system – A small, non-disruptive sealant injection machine will be designed and developed to allow operators to transport the system through a customer's property if required. The injection method should not require fuel powered hydraulic or pneumatic plant to operate.

Field Trials – Field trials will be carried out in collaboration with the NGN Project Team and their field technicians. Information from the trials will be fed back to SVI design and development staff and acted upon accordingly until a successful, cost effective and safe system is developed. Field trials will be monitored by an SVI Project Manager and NGN Project Team representative.

Project completion – The project will be deemed complete once the field trial stage has been completed successfully and all of the project criteria have been met. Upon field trial completion, an SVI Project Manager will produce the project completion report for review by the NGN and SVI Project Teams. Upon successful review, the Final Project Report will be published and presented to NGN.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project will be deemed successful if the following criteria are met:

- The system is transportable through a customer's property.
- The system fully fills the annular space beneath a property and by at least 2m outside of the building line
- Injection of sealant can be accomplished through varying connections to the annular space.
- It realises an increased ability to plan 'Live Mains Insertion' projects with built over properties in the vicinity.
- Enables the total decommissioning/abandonment of annular spaces beneath customer properties.
- Be deployable from remote, less sensitive areas within the customer's private boundary as and when required.
- Reduce disruption to members of the public by abandoning annular spaces without the need to fully excavate them or carry out expensive and disruptive diversion work.
- Improve safety to members of the public.
- Cost benefits due savings made against main laying operations.
- Cost benefits due to the ability to abandon the annular space without the need of multiple excavations to allow main laying techniques such as diversions.
- Greatly improved customer relationship.
- Zero or very minimal waste is produced that will be removed by SVI Technicians.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project will be undertaken within Yorkshire in the NGN network. Several field trial sites have already been identified and it is thought that performing the new technique in these locations will greatly reduce the risk to members of the public living in the properties in close vicinity.

A recent enquiry made by NGN regarding the quantity of known 'overbuilds' that would require immediate remediation has revealed the following numerical data:

The Annular Space Abandonment system will be designed to permanently abandon the annular gaps created between PE inserted gas mains and the old metallic gas main. It is envisaged that the technique will be suitable for Tier 1 gas main sizes. All of the possible size combinations of inserted PE pipe and host metallic pipe will be covered.

The system will be developed to enable a SVI Contracting team to attend site and complete a project in one day. It should be possible to carry out multiple projects in one day if they are located on the same site or street which will reduce the cost of installation to NGN.

The system should be small and light enough so that it can be transported through a customer's property without causing large amounts of disruption. This will involve development of a lightweight and compact sealant delivery machine. It would be beneficial if the injection machine did not require large scale plant such as pneumatic or hydraulic power packs.

The system should take no longer than 2 hours to make ready and deploy and complete.

NGN main/service laying teams will be responsible for the excavation of the metallic main within the occupier's property.

It should be possible to access the annular gap using more than one technique. Examples of this could be via an under pressure tee or service top tee. These methods will be developed by SVI during the project.

Field trials will be undertaken by SVI under direction of NGN. The field trials will be monitored and modifications and development undertaken as required.

The primary function of the Annular Space Abandonment system will be to totally remove the risk of gas build up inside annular spaces beneath built over properties.

The technique must satisfy all of the field trial criteria and successfully fill the T1 annular space.

Technology Readiness at Start

TRL7 Inactive Commissioning

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

NGN's Geographical area

Revenue Allowed for the RIIO Settlement

This project will impact the safety output in the RIIO settlement reducing the lenghths of main taken off risk. NGN recieved £227m of TOTEX allownace in 2015/16, we estimate that this project could save £60k-£120k per operation, the amount saved will depend on how many are carried out each year.

Indicative Total NIA Project Expenditure

NGN External expenditure - £98,000

NGN Internal expenditure - £32,667

Total NGN expenditure - £130,667

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)

There are a number of quantitive cost savings which are based on figures for main Laying, services, excavations and reinstatement. The forecasted cost saving per project is £15,000 - £30,000, the variance relates to the varying size of required diversions.

There are additional qualative savings relating to customer and stakeholder benefits when avoiding costly and disruptive diversion work.

Please provide a calculation of the expected benefits the Solution

Four field trial site will be identified, the forecasted cost saving will range between £60,000 and £120,000. Over time a normalized benefit figure will be calculated, average forecasted saving is £90,000 for the 4 field trial sites.

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

The operation to rectify built over mains is carried out by all network licensees. The learning and implementation could be therefore adopted by all GDN's

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

The roll out would be subject to the innovation strategy of each individual licensee. The proposed solution will deliver an alternate option for rectifying built over mains issues as a reduced cost, therefore no additional costs would be incurred.

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 innovation will deliver a safe system to deal with the problem of built over mains that causes minimal disruption to customers and members of the public while keeping excavation to a minimum is required. The solution could be adopted by all GDN's.

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

The innovation is aligned primarily to the Asset and network management area of the innovation strategy. The development of a solution that will remove the need to divert around buildings which have been built over a gas main will meet legislative requirements and provide an alternate approach to incorporate into the gas mains replacement strategy.

☑ 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