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

Aug 2020

Project Reference Number

NIA_NGN_273

Project Registration

Project Title

Legacy Stubs

Project Reference Number

NIA_NGN_273

Project Licensee(s)

Northern Gas Networks

Project Start

August 2020

Project Duration

1 year and 7 months

Nominated Project Contact(s)

Thomas McPherson

Project Budget

£578,407.00

Summary

Steve Vick International working in partnership with Northern Gas Networks will design, develop and field test a suitable solution to enable the seal or abandonment of Tier 1 and Tier 2 metallic stubs up to and including the final transition joint prior to the parent main connection. A solution which currently does not exist.

Third Party Collaborators

Steve Vick International Ltd

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

Northern Gas Networks currently abandon metallic stubs using a mixture of ESEAL and traditional tee piece cut out techniques.

The ESEAL system can be employed on metallic Tier 1 stubs with lengths in excess of 2m after a flow-stopping and cutting procedure has been completed by network operatives. Steve Vick International (SVI) are then able to install the system through a bespoke endcap under no-gas conditions. It is expected that legacy stubs will be shorter than the minimum length requirement to allow safe flow-stopping.

The Tier 2 system can be deployed on stubs with lengths in excess of 3.5m for 9” – 12” but requires a minimum length of 4m and a large diameter flow-stopping procedure to be carried out on any stub with a diameter greater than 12”. This inevitably requires a 3rd party flow-stopping company to flow-stop, part the main and install a full-bore valve to allow SVI access to the stub interior via a bespoke spool and endcap arrangement. It is expected that Tier 1 and 2 legacy stubs may be shorter than the minimum length requirement to allow flow-stopping activities and therefore ESEAL 1 and 2 operations to take place. Some legacy stubs are expected to be in locations where access is difficult or impossible. This may be due to varying factors, for example other underground plant or excavation restrictions placed on new or sensitive road areas. The cost for full scale tee piece cut outs to remove the stubs is also very high and potentially carries additional risks to the public and network operatives which require additional management and mitigation.

Method(s)

Northern Gas Networks are working in partnership with Steve Vick International, who will design, develop and field test a suitable solution to enable the seal or abandonment of Tier 1 and Tier 2 metallic stubs up to and including the final transition joint prior to the parent main connection.

Discovery – an initial stakeholder session has already taken place with relevant stakeholders across Northern Gas Networks to develop a scope and clear objectives for the project.

Design & Development – As the supplier, Steve Vick International (SVI) will undertake Design & Development work at their research facilities in Bradford on Avon, Wiltshire. SVI will detail all work carried out and all key decisions made in the form of a Design & Development Log. This document will inform NGN and SVI in the decisions made at each pre-determined stage gate of the project prior to advancing to the next phase.

Field Trials – Carried out under G23 mandate, this phase will establish if the new systems are suitable for installation on the gas distribution network. It will establish the number of projects that can be carried out in one working day and will help assess future cost of each project when being used as an approved technique.

Project Closure - This phase will assess the project in its entirety and establish if it has met the initial scope and objectives formulated during Phase 1. It will leave the project in a situation where implementation into the NGN and SVI business models is easily achievable

Scope

This project covers the design, manufacture and testing of equipment of Tier 1 & Tier 2 Pipe diameters, including GIS:LC14 Approved sealants.

The scope has been broken down into the following stages:

- Tier 1 Foambag Design & Development
- Tier 1 Entry System Design & Development
- Tier 2 Foambag Design & Development
- Tier 2 Entry System Design & Development
- Remote Entry System
- Witnessed testing to enable G23 documentation
- Fields Trails – A total of 40 Field Trails will be undertaken. 20 Tier 1, 10 Tier 2 & 10 Remote Installations
- Training
- Project Closeout.

Benefits of this project include but are not limited to :

Cost Saving : Reduction in excavation costs when compared to the traditional methods. Provide a solution to all Tier 2 stubs ≥18”Ø removing the need for full scale tee piece cut outs on the parent main for any stub with a diameter greater than 14”.

Risk reduction: Removes the risks of potential deep excavations on parent mains and potentially removes or significantly reduces the requirements of Traffic Management.

Customer and Stakeholder Benefits: Operations can be carried out in a shorter period of time causing less interruption than traditional methods. Additionally, the reduction of Traffic Management and occupation of highways minimizes the disruption on customers and stakeholders.

Environmental Benefits: Significant reduction is excavation size compared to normal tee piece cut out on a parent main. There is potential to further reduce excavation size of standard ESEAL 1 and 2 projects by removing the requirement for flow-stopping.

Objective(s)

This project will aim to meet the following objectives:

Design & Development of:

- Tier 1 Foam bag system for abandoning metallic legacy stubs.
- Tier 2 Foam bag system for abandoning metallic legacy stubs
- Tier 1 and 2 reusable gas tight pipe entry system
- Remote entry system to allow Tier 1 and 2 operations to be carried out from within the parent main

Measured using pressure testing, installation validation testing and data collection via the Project Log document. Phase success measured at the stage gate meeting. Overall success measured with Field Trials and reporting to be assessed at the project closeout phase

- Fully approved Legacy Stub system for use on Tier 1 and 2 metallic stubs - All documentation must be published and approved to G23 standards by SVI and NGN.
- Ready for Implementation – The project will be measured using all of the published and presented data and reports from design, development and testing to enable implementation.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project will be deemed as successful if the solution can:

- Permanently seal the metallic legacy stub end.
- Be able to install without the use of standard flow-stopping techniques
- Assess suitability for installation from Core & Vac Excavations.

Project Partners and External Funding

Northern Gas Networks
Steve Vick International

Potential for New Learning

The potential to enable the seal or abandonment of Tier 1 and Tier 2 metallic stubs up to and including the final transition joint prior to the parent main connection

Scale of Project

The scale of the project will consist of the following:

- Design & Development of Tier 1 & Tier 2 Foam Bags
- Design & Development of Tier 1 & Tier 2 Entry System
- Witness testing to enable G23 Documentation
- 20 Field trials of Tier 1 Foam bag system
- 10 Field Trails of the Tier 2 Foam bag System
- 10 Field Trails of the Remote entry system to be carried out from within the parent main
- Executive summary & Closure report

Following the completion of the above will enable Northern Gas Networks to maximize the opportunity to seal and abandon as many of the known 7000 metallic stub ends by 2032.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The project will be developed at Steve Vick premises and trialled in the NGN Network.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External funding = £245,792
Internal cost = £330,615

Total Cost = £578,407

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)

As a mixture of resource time, cost and materials, the benefits of which have been calculated below:

Potential annual cost benefit: £2,007,500

Additional benefits for customers include reduction excavation size leading to reduced traffic disruption, reduced noise impact and shorter duration times.

Please provide a calculation of the expected benefits the Solution

Total NGN legacy stubs workload – 7300
Proportion estimated not suitable for ESEAL1 &2 (As part of GD2 Submission) – 55%
Remaining target population - 4015
Years to end of Repex program - 11
Target stubs per year - 365

Potential annual cost benefit: 365 x £5500 =£2,007,500

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

All networks are required to undertake this activity as part of the enforced gas mains replacement programme. The learnings from Tier,1 Tier 2 and remote access will be adaptable to all other Gas distribution networks.

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

The closure report will enable the cost of rolling out to be identified and circulated as part of the project closure.

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 currently have legacy stubs which under current HSE Requirements must be decommissioned.

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 challenges this project meets are Asset and Network Maintenance and Distribution Mains Replacement. The ability to abandon Tier 1 & 2 Stubs remotely has a massive benefit to the customer as well as preventing additional work load for operational delivery.

☑ 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.

The project detail has been shared at GIGG and several checks, including a search of the SNP have been undertaken to ensure no current solution exists to address the outlined challenge.

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

There is currently no method or solution which deliver the full abandonment of mandatory pipes not suitable for the current ESEAL techniques approved for use on the networks.

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

The tasks in this project all start at a low TRL and there is a degree of risk through the development phase to deliver a solution which will meet the project objectives. Due to this uncertainty and level of risk, it is not a project suitable to be funded via business as usual methods.

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

Commercially, the previous ESEAL Method is well established and allows networks to operate efficiently. The move to abandon legacy stubs without a cut out of parent main presents significant operational and technical uncertainty which involves not just a high direct cost to NGN but also significant social and environmental impacts due to large excavations, traffic disruption and time taken working is commercially uncertain and therefore makes this appropriate to fund via the NIA mechanism.

This project has been approved by a senior member of staff

☑ Yes