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

Feb 2018

Project Reference Number

NIA_NGN_226

Project Registration

Project Title

Live ECV Exchange

Project Reference Number

NIA_NGN_226

Project Licensee(s)

Northern Gas Networks

Project Start

February 2018

Project Duration

0 years and 7 months

Nominated Project Contact(s)

Phil Crow

Project Budget

£62,533.00

Summary

An Emergency Control Valve (ECV) is a safety mechanism on a gas service pipe connecting a gas meter to the gas mains. Every gas customer pipe installation and meter will have one as required by legalisation.

The ECV is situated where the gas network or gas transporters 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.

When the requirement to exchange the ECV is identified NGN are required to interrupt the customers gas supply on 100% of occasions, replace the equipment and then undertake a reconnection operation.

The need to introduce technology into business operations is commonplace within GDN's and is aligned to the advancement technology and wider acceptance and appetite to look for innovative solutions within NGN. The implementation of improved techniques, equipment and processes into NGN has enabled the exploitation of technology based solutions to support and execute business operations.

The adoption of the proposed solution paves the way for NGN to potentially undertake live operations on our network assets with the need to interrupt customer's supplies and the impact on customers be significantly reduced.

Third Party Collaborators

Synthotech Limited

Nominated Contact Email Address(es)

innovation@northerngas.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 customer pipe installation and meter will have one as required by legalisation.

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Method(s)

Synthotech have previously developed two systems for use of exchanging valves and/or plugs under controlled conditions;

M-CEX™ The Meter Control Exchange system is a versatile, safe and efficient method of exchanging leaking valves from gas pipework systems under controlled 'live' gas conditions. The system is designed using our unique Stargland™ gas seal technology and includes a range of rigid and flexible stoppers suitable for metallic and polyethylene (PE) pipes.

CaPEX® — the safe, versatile system for removing caps and plugs from gas pipework systems and replacing them with an ECV (emergency control valve). CaPEX® is a fully tested and approved system for removal of a cap / plug and subsequent replacement with an emergency control valve (ECV). The Cap and Plug Exchange (CaPEX®) system is designed to deliver a complete procedure without the need to isolate the supply and riser system. It can also be used to determine if a gas pipe is 'live' or 'dead'.

NGN have identified a need to be able to undertake the exchange of ECV's without disruption to the consumer e.g. no interruption to supply. This therefore requires an evolution of the CaPEX® bag and may require background IP from M-CEX should NGN require the ability to incorporate a bypass at a later date.

This project was originally commissioned under NIA with Scotia Gas Networks and concluded there were a number of methodologies that would allow GDNs to remove ECV's under 'live' gas conditions and have a bypass. This approach would reduce impact on the consumer ensuring that there is no interruption to gas supply. Due to changes in the SGN business case the project was mutually ended at TRL3 before practical prototype solutions had been developed.

This project will build on the work undertaken between Synthotech Ltd and SGN to develop the TRL4 conceptual designs to show the operational and technical challenges. The development will focus on the exchange of ECV's under "live" gas conditions rather than a development for live service insertion, this could be undertaken at a later date.

Scope

This is a collaboration between Synthotech Ltd and NGN to make sure the application meets requirements and user expectations, before extending to other local authorities.

The scope will include:
• development of a TRL4 solution – up to three prototypes will be manufactured
• client Engagement work shop facilitated by Synthotech to look at operational challenges for NGN
• manufacture of a working TRL4 concept, that can be used on air up to 40mbar
• technical reporting

Objective(s)

The primary objectives are to determine if a prototype system meets the requirements to undertake a ECV exchange in a safe, controlled manner and in 'no gas' conditions on live gas supply.

The specific objectives are:
• Development of a concept – TRL4
• Selection of the most suitable enclosure – flexible vs rigid
• Demonstration of the concept in a controlled environment
• Review of E&R Procedures related specifically to ECV exchange
• Development timeline for TRL5 to TRL8

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project will be judged a success if the project results in completed:
• development of a TRL4 solution – up to three prototypes will be manufactured
• client engagement work shop to look at operational challenges
• manufacture of a working TRL4 concept, that can be used on air up to 40mbar
• Technical report on clear specification requirements for future developments and enhancements, not covered in this initial project

Project Partners and External Funding

Northern Gas Networks

Synthotech

This project will be soley finded uner NIA.

Potential for New Learning

Potential learning from this project are:
• Can the prototype design enable live operations to be undertake on an ECV without disruption to the customers supply.
• Will the technical learning and understanding be transferable for use on other network assets

Scale of Project

The project will see the development of a TRL4 solution where up to three prototypes will be manufactured that will be used in a controlled environment on air up to 40mb.

An engagement workshop, facilitated by Synthotech will be undertaken involving key personnel from NGN to look at operational challenges that the solution may present. The scale of involvement from within NGN will primarily involve Emergency and Repair colleagues with additional stakeholders being from the Quality assurance, Standards and customer teams.

A technical report will be produced at the end of the project to support an initial Quality Assurance G23 assessment relating to the solution being suitable for use on the live gas network and supporting evidence towards the creation of Usage Procedure – (How and when the Live ECV exchange solution will be used)

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

NGN Network area

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External Costs £46,900
Internal Cost £15,633
Total Project costs £ 62,533

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)

This is a development and demonstration project that will build a desktop prototype and will require further development via a second phase to realize full benefits.
The forecasted future project benefits are primarily qualitative. Whilst there will be some immediate quantitative financial benefits, the quantifiable benefits will need to be proven over time to allow assessment relating to improvement over the existing manual process.

Please provide a calculation of the expected benefits the Solution

This is a development and demonstration project that will build a prototype and will require further development via a second phase to realise full benefits.

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

As above

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

As above – Cost to be determined upon full completion.

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 are required to undertake repair and maintenance work as part of operational delivery and this solution could therefore be transferable.

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 challenge identified for improvement in this instance relates to Customer Service and also Asset and Network management, this project has the potential for network Licensee's to undertake live ECV exchanges to deliver a more efficient and high-quality service.

☑ 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 technology search has been undertaken and no such solutions exist or are under development. A thorough search of the Smarter Networks Portal and engagement with other GB network Licensees has also confirmed no work to deliver such a solution is in progress.

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

The project is innovative and has been conceived following a previously funded NIA research project. The development of technology and the advancement of the research study previously undertaken will test practicality of the proposal to deliver a step change in the execution of operations and enable true 'live uninterrupted operations' to be undertaken on a customer's gas supply.

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 concept for the proposed solution is untested and carries significant uncertainty relative to existing approved technology solutions. The project benefits from this project are primarily qualitative and whilst there are some immediate quantitative financial benefits, the quantifiable benefits will need to be proven over time to allow assessment relating to improvement over the existing manual process.

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

The project benefits that are primarily qualitative are the key drivers that make this project suitable for NIA funding. The improvement in this instance relates to efficiencies in both Customer Service and also Asset and Network management.

This project has been approved by a senior member of staff

☑ Yes