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

May 2018

Project Reference Number

NIA_SGN0128

Project Registration

Project Title

Ball Valve Replacement

Project Reference Number

NIA_SGN0128

Project Licensee(s)

SGN

Project Start

May 2018

Project Duration

2 years and 6 months

Nominated Project Contact(s)

Stuart Sherlock

Project Budget

£139,329.16

Summary

External corrosion has been identified on auxiliary valves on the impulse rails to the governors. The external corrosion is due to condensation from pressure reduction, and galvanic corrosion due to dissimilar metals. There are a significant number of governors within SGN network operating at 2 to 7 Bar consisting of approximately 1600 Streams. Currently the governors must be bypassed or isolated at the fire valve to enable the valves on the impulse rails to be removed and replaced. This can often lead to a stream replacement or a full governor replacement.

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

External corrosion has been identified on auxiliary valves on the impulse rails to the governors. The external corrosion is due to condensation from pressure reduction, and galvanic corrosion due to dissimilar metals. There are a significant number of governors within SGN network operating at 2 to 7 Bar consisting of approximately 1600 Streams. Currently the governors must be bypassed or isolated at the fire valve to enable the valves on the impulse rails to be removed and replaced. This can often lead to a stream replacement or a full governor replacement.

Method(s)

Develop a solution to extract two types of ball valves from Gas Distribution Governors located within the SGN regions. It is proposed to install a mechanical extraction device around the shut Ball Valve by removing the handle.
For the next stage it is proposed to utilise the principal of an existing Arctic Driver System, currently used to extract ferrules under pressure in the water sector. This will then be further developed to allow for a full encapsulation of the ball valve and extraction gas free while securing the Ball Valve at all times throughout the process whilst live gas is present.
The project will focus on the conceptual design and manufacture of a prototype sealing system. This system is to isolate beyond or around the leaking or corroded ball valve to allow them to be removed.
A pre-production phase prototype will be developed and deployed over 3 live field trial sites with the results of the trials being fully assessed.

Scope

The project will focus on the conceptual design and manufacture of a prototype sealing system. This system is to isolate beyond or around the leaking or corroded ball valve to allow them to be removed.
It is proposed, by installing a mechanical extraction device around the shut Ball Valve by removing the handle – based on the existing system that is used to extract ferrules under pressure in the water sector – this will allow for a full encapsulation of the ball valve and extraction gas free while securing the Ball Valve at all times throughout the process.
This would be the first time that this methodology would be used on a live UK gas network.

Objective(s)

- Complete and provide a detailed conceptual design to meet the performance criteria for the extraction of ball valves from Gas Distribution Governors.
- Complete a risk assessment and gap analysis of the conceptual design against relevant aspects of primary and secondary legislation, SGN and Gas Industry standards.
- Carry out a detailed design review, addressing design gaps identified.
- Manufacture prototype for use and carry out offsite testing against criteria specified.
- Following completion of the off-site testing, incorporate any design revisions as required to allow approval for live field trials or otherwise.
- Provide training package and training for operatives carrying out the valve replacements.
- Support the installation and track performance of at least 3 live field trials.
- Assess the performance from the trials and review the outcomes and provide recommendations
- Following the live trials, prepare installation and maintenance Work Instructions in SGNs Safety Management Framework (SMF) format.
- A detailed final report is required on completion of the project.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- Completed conceptual design to meet the performance criteria.
- Prototype manufactured and offsite testing against specified criteria; ensuring satisfactory completion of a suitable and appropriate quality control test, in accordance with the relevant manufacturing standards.
- Incorporate any design revisions as required and prepare method statement and evidence in accordance with SGN's own procedures specifically assessed against the criteria in SGN/PM/G/23.
- Training package produced for operatives carrying out the valve replacements.
- The installation and monitored performance of at least 3 live field trials (2 in Scotland, 1 in Southern).
- Following the live trials, prepare installation and maintenance Work Instructions in SGNs Safety Management Framework (SMF) format that enable an SGN operative/suitably qualified contractor to follow a clear set of guidelines to undertake works.
- Completion of a detailed final project report.

Project Partners and External Funding

Sarco Stopper

Potential for New Learning

The Project is expected to develop the following new learning for Network Licensees

- Awareness that a solution is available for the live extraction of ball valves from Gas Distribution Governors
- Training package and training for operatives carrying out the valve replacements
- Work Instructions in SGNs Safety Management Framework (SMF) format that enable an SGN operative/suitably qualified contractor to follow a clear set of guidelines to undertake works.

Scale of Project

This project has been designed initially to undertake the conceptual design and then progression to the manufacture of a prototype for offsite testing, preparation of method statements and evidence in accordance with SGN/PM/G/23, to allow approval for live field trials.
Provide training package and training for operatives carrying out the valve replacements.
Undertake at least 3 live field trials (2 in Scotland, 1 in Southern).
Following the live trials, prepare installation and maintenance Work Instructions in SGNs Safety Management Framework (SMF) format that enable an SGN operative/suitably qualified contractor to follow a clear set of guidelines to undertake works.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The learning from this project is relevant to all GB GDNs.

Revenue Allowed for the RIIO Settlement

There are a significant number of governors within SGN network operating at 2 to 7 Bar consisting of approximately 1600 Streams. The auxiliary valves are being identified as having accelerated corrosion issues on two types of ball valves which are required to be replaced.

Indicative Total NIA Project Expenditure

The total eligible NIA project expenditure expected to be £104,523, 0f which 90% is Allowable NIA expenditure (£94,071)

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 this project focuses on a conceptual design and the manufacture of prototype, for offsite testing and live field trials, it is envisaged that this novel BVR, would lead to the following financial benefits:

- Reduction in costs for repairs due to not having to bypass the governors
- Prevention of having to isolate governors
- Reduction in costs of not having to fully replace the governors
- Reduction in costs relating to governor replacements in alternative locations

Please provide a calculation of the expected benefits the Solution

There is a significant number governors within SGN network operating at 2 to 7 Bar consisting of approximately 1600 Streams. The auxiliary valves are being identified as having accelerated corrosion issues on two types of ball valves which are required to be replaced. Additionally, any further corrosion issues on the ball valves that are identified during examinations that may require replacing. If this project is successful the full potential savings that could be achieved under RIIO-GD1 will be determined upon completion of this project.

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

It is anticipated that the other Networks will be experiencing similar corrosion issues on these ball valves with the same issues regarding the isolation of these therefore this project will be of benefit across the other GDN's (Gas Distribution Networks).

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

N/A

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 generated from the conceptual design, the offsite and on-site trials of the Ball Valve Replacement solution and the outcomes can be shared in a final report. This new technology is anticipated to deliver savings in lifecycle costs to benefit the networks.

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

Reliability and Maintenance
☑ 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 other Network License's NIA Annual Reports was performed prior to the start of this project and no similar projects were identified.
Upon project acceptance from Ofgem, we will publish details of this project on the public domain to ensure no unnecessary future duplication will occur.

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