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NIA Project Registration and PEA Document

Date of Submission

Jan 2015

Project Reference Number

NIA_SGN0068

Project Registration

Project Title

PE Bodied Valves

Project Reference Number

NIA_SGN0068

Project Licensee(s)

SGN

Project Start

February 2015

Project Duration

1 year and 5 months

Nominated Project Contact(s)

Stephen Tomlinson, Innovation Project Manager

Project Budget

£253,172.00

Summary

PE bodied valves, up to and including 180mm, are currently allowed for use on gas distribution networks in GB in accordance with Gas Industry Standard GIS/V7-2:2006. SGN only currently use PE bodied valves up to 63mm. The use of metal bodied valves above 63mm currently requires corrosion protection via coatings and wrapping. Extending the use of PE bodied valves up to and beyond 180mm for all distribution activities provides an opportunity to reduce expenditure on corrosion protection for metallic valves.

Therefore, the project scope will include the following:

- Review of global products currently available.
- Review of double block and bleed requirement for distribution network valves.
- Gap Analysis of current products with GIS/V7-2
- Selection of products for testing
- Off Site testing
- Live field trials
- Draft Specification for PE bodied Valves >180mm
- Report documenting findings.

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

SGN is the second largest gas network licensee in Great Britain (GB) and operates two of GB's largest gas distribution networks (GDN's) which distributes gas in Scotland and in the south and south east regions of England, providing a safe and secure supply of natural gas to 5.8 million customers through 74,000km of gas mains. In order to do this, gas valves are required as an integral, essential element throughout every aspect of SGN's distribution network operations. However, PE valves are currently only used for up to 63mm diameters, therefore metallic valves are still used for all greater than 63mm activities and incur the associated costly corrosion protection and remediation activities. This identified problem is becoming increasingly apparent as SGN's distribution mains and service asset portfolio continues to move towards PE and away from metallic materials.

Current Gas Industry Standards (GIS) allow for the use of PE bodied valves of up to 180mm on the GB Network. SGN currently only utilise PE valves for 32mm and 63mm applications. This means that there is a risk of corrosion and the need for corrosive protection (CP), anodes, wrapping etc, for above 63mm valves utilised by SGN. Adopting the use of PE valves for all of SGN's distribution activities provides an opportunity to reduce expenditure associated with preventing and repairing corroded assets.

Also being carried out as part of this project is a review of the 'Double Block and Bleed' requirements on SGN's distribution network as this currently represents a restriction to the opportunities of utilising many valve types including PE bodied valves.

Method(s)

This project has been divided into three key phases, detailed below.

Phase 1 : Product Review

- Review of existing manufacturers of PE valves and available products.
- Review of requirement for Double Block and Bleed facility on distribution network valves.
- Engagement with manufacturers to assess cost and availability of products.
- Assessment of suitability of available products for SGN network operations.

Phase 2 : Product Testing

- Develop testing criteria for preferred PE bodied valves.
- Arrange off site testing for preferred products.
- Report results of off site testing and recommendations for live field trials.
- Develop criteria for live field trials of PE valves
- Monitor progress of live field trials.
- Report results of field trials complete with conclusions and recommendations.

Phase 3 : Production of Specification for >180mm PE Bodied Valves

- Draft new specification for the use of PE bodied valves >180mm on the SGN network
- Develop work instructions for operatives based on SGN approved specification
- Support for Draft Spec through SGN Governance and approval

In addition, a final project report will be produced detailing findings from all stages and include conclusions and recommendations.

Scope

PE bodied valves, up to and including 180mm, are currently allowed for use on gas distribution networks in GB in accordance with Gas Industry Standard GIS/V7-2:2006. SGN only currently use PE bodied valves up to 63mm. The use of metal bodied valves above 63mm currently requires corrosion protection via coatings and wrapping. Extending the use of PE bodied valves up to and beyond 180mm for all distribution activities provides an opportunity to reduce expenditure on corrosion protection for metallic valves.

Therefore, the project scope will include the following:

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- Live field trials
- Draft Specification for PE bodied Valves >180mm

- Report documenting findings.

Objective(s)

The investigation, technical assessment, gap analysis and field trials for extending the use of PE bodied valves for use on the GB Network.

A review of Double Block and Bleed valve requirements on SGN's distribution network.

The discovery and approval for use on SGN's network of PE valves >63mm.

The production of a new (or amendment of existing) specification allowing the use of PE bodied valves of greater than 180mm on SGN's distribution network

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The following success criteria apply to this project:

- Completed review of global products currently available.
- Completed review of double block and bleed requirement for distribution network valves.
- Completed Gap Analysis of current products with current specifications and standards.
- Completed off site testing of selected products and completion of live filed trials.
- Approval of selected >63mm PE Valve products for use on SGN's distribution network.
- Completed draft Specification for PE bodied Valves >180mm.
- Completed full project report.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This project could not be carried out on a smaller scale. A small number of field trials on SGN's Gas Distribution Network to support product approval will be carried out.

The rest of the project consists of desktop studies and off site testing.

Technology Readiness at Start

TRL6 Large Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The live trial aspects of this project will be carried out on sites situated in SGN's Scotland, South and South East Networks.

Revenue Allowed for the RIIO Settlement

As PE valves can be utilised across a number of different operational activities it is not possible to accurately identify this. However, during RIIO-GD1 it is estimated that SGN will spend approximately £255.7m and £209.6m on emergency and planned repairs respectively on all mains. As this project potentially extends the use of PE valves it can be expected that corrosion related repairs will reduce. It can also be expected that the installation of new valves will be more efficient as corrosion protection will not be required.

Indicative Total NIA Project Expenditure

The total project expenditure is £253,172, 90% of which is allowable NIA expenditure (£227,855)

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)

If it is assumed that, after successful completion of this project, PE valves can be utilised in all of SGN's operational activities and that the material costs of both PE valves and metallic valves are comparable, the potential annual saving to SGN due to the reduction in corrosion protection activities for 'non maintained assets' would be £350,000. This saving has the potential to significantly increase once 'maintained assets' and other valve associated activities (such as ease of installation compared to existing etc) are included. A conservative estimate of these other activities would be a further £350,000 saving per annum which gives a total conservative estimated annual saving potential of £700,000 for SGN.

If a 4:2:1:1 split is used in relation to the size of the four GB gas distribution network licensees then it can be assumed, based on the above figure for SGN, that a total GB GDN saving of £2.8 million can be potentially achieved.

Please provide a calculation of the expected benefits the Solution

SGN install approximately 1400 above 63mm diameter 'non-maintained asset' metallic valves per year across its operational footprint. Corrosive protection of these assets costs approximately £250 per valve. This equates to a cost of £350,000 per annum. This figure doesn't include the costs associated with repairing corroded valves and the protection of 'maintained asset' valves.

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

The potential outcomes of this project are replicable across GB. All the network licensees will be able to utilise PE valves throughout all operational activities pertaining to their gas distribution networks.

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

Excluding the cost of purchasing valves, 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 request, this will allow 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.

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