

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

Oct 2016

Project Reference Number

NIA_NGGD0071

Project Registration

Project Title

EZ valve: Live Insertion of Pipeline Isolation Valves on Risers

Project Reference Number

NIA_NGGD0071

Project Licensee(s)

Cadent

Project Start

September 2016

Project Duration

4 years and 8 months

Nominated Project Contact(s)

Ben Williams – National Grid Gas Distribution
Andy Newton – Innovation Portfolio Manager
Kevin Murphy – Advanced Valve Technology
Jason Taylor – Advanced Valve Technology
Ian Aldridge – National Grid Gas Distribution

Project Budget

£208,590.00

Summary

A set of valves will be designed, developed, prototyped and tested during field trials to determine the efficacy of the solution. This will involve collaboration between NGGD and AVT to develop and test these new solutions.

The diameter range of these valves will be: 1 1/2", "2, 3", 4" and 6". V17: Specification for Distribution Valves part 1 will be used as a baseline specification (although development will not be restricted to this specification).

The design and development stages will be carried out at AVT's factory in Chicago, Illinois, US and field trials will be carried out on selected sites on NGG's gas network.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

Currently there is no readily available method to insert a Pipeline Isolation Valve (PIV) onto metallic mains under live conditions. This presents a problem in a variety of areas, particularly for Multi-occupancy Buildings (MOBs) where a PIV may not be available on an existing system which means that i) the system cannot be easily isolated in an emergency situation and; ii) it may be necessary to replace the entire riser system as part of a planned replacement project. Being able to provide a valve which could enable the remediation of the riser as opposed to full replacement will provide benefits for the GDN and the customer

Method(s)

NGG was approached by Advanced Valve Technologies (AVT) who currently deploy this technology in the water industry and have

completed several thousand installations across the globe. The company identified a theoretical path to adapt the technology to suit the gas industry and it is believed that further development will create a viable solution which will provide time, cost, safety and customer satisfaction benefits.

Whilst this project is initially focused on MOB's, the valve will be built in accordance with the requirements of NGG and there is further potential to use it on other types of network systems.

The method of development will have 4 key stages. These are:

1. concept design
2. detailed design and development
3. prototype manufacture and build
4. field trials and proof of concept.

Scope

A set of valves will be designed, developed, prototyped and tested during field trials to determine the efficacy of the solution. This will involve collaboration between NGGD and AVT to develop and test these new solutions.

The diameter range of these valves will be: 1 1/2", "2, 3", 4" and 6". V17: Specification for Distribution Valves part 1 will be used as a baseline specification (although development will not be restricted to this specification).

The design and development stages will be carried out at AVT's factory in Chicago, Illinois, US and field trials will be carried out on selected sites on NGG's gas network.

Increased valve range (now 1 1/2", 2", 3", 4" and 6").

Increased scope of works for Macaw (to include G/23 and monitoring regime).

Objective(s)

Project objectives:

Develop a set of valves which can be applied to metallic mains under 'live' gas conditions by;

- Refining the theoretical concept by adapting the existing technology
- Developing a detailed design for the valves
- Prototyping of valves
- Field trial and proof of concept.

The project will deliverable a set of valves that can be used on National Grid's network, however, further evolution of the product as a fully deployable solution for the gas industry would require further quality assurance and acceptance testing (independent testing of valves in accordance with industry standards BS EN 12266-1:2012 and GISV7: Part 1.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

At the end of the project, NGG will have a developed and proven a range of valves which can be used operationally

Project Partners and External Funding

Project partners:

- National Grid Gas Distribution – 100% NIA funded
- Advance Valve Technology – No external funding.

Potential for New Learning

The results from the trial will enable us to decide whether any further work needs to be done to develop the system so that it is fit-forpurpose. There is also potential to use the valve on a wider scale on the gas distribution network and the trials will provide valuable information/data which will further qualify this assertion.

Scale of Project

The project will involve the development of the valve from concept through to field trials

Technology Readiness at Start

Technology Readiness at End

Geographical Area

The field trials will take place within NGGD's distribution network. No site has been selected at the time of writing but it is fully expected that these trials will commence in the North London network.

Revenue Allowed for the RIIO Settlement

n/a

Indicative Total NIA Project Expenditure

Total (£) £208,590*

*NOTE Total Project Expenditure updated post internal review of sanctioned value.

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)

NGG will have a cost-effective solution which will ensure that our gas riser assets are built to the current regulations; ultimately ensuring the safety of our customers. Without this system NGGD would either need to cut-off the gas supply/by-pass to insert a valve or potentially replace the whole asset.

The true benefits of the project are:

- Health and Safety
- Compliance
- Response time/speed of construction
- Live gas installation therefore no interruption
- Cost-effective
- No need for large excavations – minimal footprint required.

The vision for the valve will allow its installation on problematic risers where a valve was not installed or has been 'lost' due to 'secondary fixes' being applied post-installation. The valve therefore, will in certain circumstances allow the retro-fit of the valve which in conjunction with other repairs will negate the need to replace this riser system for the remainder of its asset life.

An indication of cost would estimate that this type of installation could provide around 50% savings when compared to executing a cut-off/by-pass configuration to retrospectively install a PIV as would be currently required.

Please provide a calculation of the expected benefits the Solution

as above

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

There is potential for the valve to be installed on a UK-wide basis (subject to GDN approval). Particularly in area with a high proportion of MOB's such as North London, North West and Scotland Networks.

To increase the scope beyond MOB's would also increase the applicability of the valve.

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

The costs will be clarified later in the project; the costs would include training and purchase of the valves. Initially, it is foreseen that the valves would be installed as a specialist service, but this could evolve over time, via a suitable training programme for field engineers.

Purchase of the valves would be done on a commercial basis (price based on volume).

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

Project outputs will be shared with the other GDN's as required.

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.

The technology is novel in the gas industry and as far as can be deduced, there is no development of this type of technology in the UK.

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