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NIA Project Registration and PEA Document

Date of Submission

Mar 2015

Project Reference Number

NIA_NGGD0055

Project Registration

Project Title

Development of Gas Industry Specification for Polymeric Pipe Lining Systems for Multi-Occupancy Buil

Project Reference Number

NIA_NGGD0055

Project Licensee(s)

Cadent

Project Start

March 2015

Project Duration

1 year and 1 month

Nominated Project Contact(s)

NGGD – Neil Russell (Project Manager) – lead GDN, NGN
– Alec Breen (Innovation Delivery Manager), SGN – Alex
Stewart (Project Manager), WWU – Lucy Mason
(Innovation Manager)

Project Budget

£256,434.00

Summary

The scope of work of this proposal is to develop a robust performance specification for the use of polymeric pipe lining technologies within multi-occupancy buildings.

The output would consist of an industry agreed standard for the performance specification and targets for any coating/lining system for the coating of small bore (predominantly below 4-inch diameter) gas pipework systems in the property types described above. The output would enable the validation of any technology in this application and the demonstration of 'fitness for purpose' both technically and the from customer perspective such as speed and inconvenience.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

There are a large number of multi-occupancy buildings across the country with internal gas risers. These risers, usually constructed of steel or copper, are approaching the end of their expected operational life, and to replace these using existing construction methods will be expensive and time consuming. NGG alone as an example has an estimated 165,000 medium rise (3-5 stories) and 2500 high rise systems (above 5 stories).

There are a number of small bore internal coating/lining technologies on the market, predominantly in use in the water industry or water related applications that could potentially be deployed in the riser application either as repair or refurbishment solutions. However, there is no industry performance standard in existence for the validation or deployment of these technologies in the gas riser application.

The absence of a standard means that the suppliers of candidate technologies are unable to judge whether their technologies are suitable in the gas riser application, or what developments they need to make to their approaches for this application.

Method(s)

The Method would be the publication of a new Gas Industry Standard that will;

- Define what a suitable and sufficient design and performance specification should look like for the complete system in order to demonstrate compliance with relevant legislation
- Demonstrate compliance and assurance of fitness for purpose.
- Provide commercial companies with comprehensive technical specification to facilitate the evaluation, verification and certification of their lining technologies for the rehabilitation of multi-occupancy building gas risers.
- Clearly define the performance criteria required for any lining technique giving the necessary assurance that certified lining technologies are fit for purpose and will deliver a known service life.
- Define the relevant QA/QC protocols that are required in order to ensure such a system consistently delivers an installed product that meets the performance requirements of the specification

Scope

The scope of work of this proposal is to develop a robust performance specification for the use of polymeric pipe lining technologies within multi-occupancy buildings.

The output would consist of an industry agreed standard for the performance specification and targets for any coating/lining system for the coating of small bore (predominantly below 4-inch diameter) gas pipework systems in the property types described above. The output would enable the validation of any technology in this application and the demonstration of 'fitness for purpose' both technically and the from customer perspective such as speed and inconvenience.

Objective(s)

The development of a specification test procedure protocol which can be conducted by any party on a coating/lining system to enable the validation of any technology for lining risers and the demonstration of 'fitness for purpose'.

Specifically the objectives of the project will be to deliver:

- A clear definition for the scope for the specification so that potential solution providers have a very clear understanding of the application and nature of its purpose.
- A comprehensive objective technical specification (Gas Industry Standard) to include all relevant design & performance requirements that all networks are in agreement with and fully approve within the scope and timeline of the project taking into account the different starting positions of each of the networks
- A clear definition of the varying degrees of repair; permanent, interim and temporary; as well as a definition as to the difference between a repair and a refurbishment. An objective customer specification agreed by all participating networks
- Define what a suitable and sufficient design and performance specification should look like for the complete system in order to demonstrate compliance with relevant legislation
- Demonstrate compliance and assurance of fitness for purpose.
- A clear definition of the relevant QA/QC protocols that are required in order to ensure such a system consistently delivers an installed product that meets the performance requirements of the specification
- The development of a risk scoring model which would take account of the delivery systems and any potential safety or environmental factor associated with these
- The resultant specification test procedure protocol which can be conducted by any party on a coating/lining system. A specification designed such that proposed compliance testing costs do not prove prohibitive and deter technology innovators. A goal of less than £100k at 2014 pricing has been set for a testing regime conducted by an external third party test house
- Consult with providers of potential solutions to understand the opportunities and difficulties they see in applying lining systems in riser situations

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- Development of a Gas Industry Standard that is agreed unanimously by all participating networks, providing a comprehensive

objective technical specification to facilitate the evaluation, verification and certification of new innovative polymer lining techniques for multi-occupancy gas risers.

- An objective customer specification agreed by all participating networks
- Successfully designing a specification test procedure protocol which can be conducted by any third party test house, with appropriate accreditation, on a prospective riser coating/lining system that can be delivered at a cost of no more than £100k at 2014 pricing.
- Successfully designing a risk model to assess delivery method

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project will consider all of the common riser building types. To consider fewer would not be effective use of resources as there are good economies of scale to have this breadth of focus in one project.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL5 Pilot Scale

Geographical Area

The project will be predominantly a document development exercise undertaken by DNV GL at their premises

Revenue Allowed for the RIIO Settlement

During RIIO-GD1 it is estimated that SGN, NGN, WWU & NGG will need to replace 5% / annum of their High rise building services stock attend 135,000 gas escapes per annum that are attributed to Gas mains, spending approximately £135m on repairs. No direct savings are expected during Project implementation but may be achieved in the future through application of the Project outputs in development of further riser lining technologies.

Indicative Total NIA Project Expenditure

The total recoverable allowance will be 90% of the project costs shown below for each Licensee under the Network Innovation Allowance (NIA):

NGGD

External expenditure - £83,000

Total External with 10% Contingency - £91,300

Internal expenditure - £30,433

EIC Costs - £24,034

Total NGGD expenditure - £145,767

NGN

External expenditure - £20,750

Internal expenditure - £6,917

Total NGN expenditure - £27,667

SGN

External expenditure - £41,500

Internal expenditure - £13,833

Total SGN expenditure - £55,333

WWU

External expenditure - £20,750

Internal expenditure - £6,917

Total WWU expenditure - £27,667

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)

Previous projects associated with the lining of risers that would benefit from the output of this project have assumed a saving of between 25-50% over current replacement method costs approximating to savings of between £13m and £26m over a 5 year period for NNGD alone.

It can be recognized that the development of this standard would be an enabler for and lead to greater success rates of future riser lining projects.

Please provide a calculation of the expected benefits the Solution

National Grid is responsible for approximately 2,500 gas riser systems in high rise buildings. NNGD assume that it would replace 170 of these riser systems over the following 5 years.

- 170 buildings over 5 years is approximately 34/year
- 34/year is approximately 1.3% of total population per annum.

National Grid is responsible for approximately 550,000 Medium Rise Buildings, of which it is believed 165,000 may contain a gas riser system. NNGD estimates that it would replace 7,218 of these riser systems over a typical 5 year period.

- 7,218 buildings over 5 years is approximately 1,443/year
- 1,443 a year is approximately 1% total population per annum (of medium rise buildings with a riser)

In the RIIO submission NNGD have planned £84 m spend on replacement MOB's over 8 years, averaged over 5 years approximates to £52 m.

For WWU there are an estimated 14,000 low rise and 346 high riser systems. Of those approximately 442 are repaired or replaced over a five year period at a cost of £2.5m, an intervention rate of 0.6%/annum.

Typical multiple occupancy building riser replacement costs are approximately £10k. It is assumed that this specification will allow for lining projects that assume savings in the region of 25-50%.

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

All Network Licensees have multiple occupancy buildings across the country with internal gas risers. The Method and outputs will ultimately benefit all GB Network Licensees.

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

Not Applicable. The output of the project will be a standard for use by all GB Networks

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

The project will develop an agreed gas industry specification to aid in future projects looking to line multiple occupancy building risers. These assets are common to all Networks and the output of the project will form a standard that will be used by all 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)

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