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 2017

Project Reference Number

NIA_NGGD0097

Project Registration

Project Title

Multi-Occupancy Building Cured In Place Lining (NuFlow)

Project Reference Number

NIA_NGGD0097

Project Licensee(s)

Cadent

Project Start

April 2017

Project Duration

1 year and 6 months

Nominated Project Contact(s)

NGGD: Hilary Buxton – Engineering Policy Manager NGGD Declan Robinson – Policy Manager (Materials) NGGD: Joe McShane - Innovation Project Manager NGGD: Andy Newton – Innovation Portfolio Manager Rosen: Simon Daniels – Principal Engineer Aquam/NuFlow: Stuart Stephens – Head of Operations

Project Budget

£138,531.00

Summary

The scope of the project is to qualify Nu Flow's small bore pipe lining/rehabilitation system on a live gas system as an interim remediation technique. The pre-work will also enable the construction project and post-completion; the learning will be taken and incorporated into the relevant policy documentation.

Project deliverables are:

- Updated G/23 site trial document
- Testing of proposed Copper-PE solution (lining, transitioning with a mechanical fitting, etc.)
- Witnessing of construction project and collation of site data and evidence and most importantly further…
- update of draft Riser Liner Specification Document

Successful delivery of this project will build on work previously completed and providing learning as to how this technology can be further applied practically. The data collected will also be used to augment the Riser Liner Specification.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

There are a number of Multiple Occupancy Buildings (MOBs) across the country with gas risers. These risers - usually constructed of

steel or copper, are coming to the end of their expected operational life, and to replace these using existing construction methods will be expensive, disruptive and time consuming. Development of an alternative method to either remediate or replace these systems is required.

NGGD has already achieved success with this technology on its gas network and are looking to further expand the scope of the technology.

Method(s)

The proposed solution will build on the success of existing work completed to date. NGGD are considering how to roll this technology out across it gas distribution network. A construction project has been identified where the technology could provide an alternative to replacement. This is particularly relevant for this project as there are architectural and aesthetic constraints. As such, the relevant bodies are keen to avoid replacement works.

NGGD will fund the construction works but the project seeks to expand upon the learning already obtained in lining.

To further determine the efficacy of NuFlow or similar products for application gas distribution systems, a small project consisting of policy review, witnessing and testing is required.

The project also seeks to test the Nuflow product against a programme of short-term testing to qualify its efficacy for interim use on the Gas Distribution Network.

Scope

The scope of the project is to qualify Nu Flow's small bore pipe lining/rehabilitation system on a live gas system as an interim remediation technique. The pre-work will also enable the construction project and post-completion; the learning will be taken and incorporated into the relevant policy documentation.

Project deliverables are:

- Updated G/23 site trial document
- Testing of proposed Copper-PE solution (lining, transitioning with a mechanical fitting, etc.)
- Witnessing of construction project and collation of site data and evidence and most importantly further…
- update of draft Riser Liner Specification Document

Successful delivery of this project will build on work previously completed and providing learning as to how this technology can be further applied practically. The data collected will also be used to augment the Riser Liner Specification.

Objective(s)

The objectives are:

- Further completion of policy documentation review to fully enable the technology on the Gas Distribution Network
- Development and testing of NuLine product as part of an engineering solution to line copper pipe systems and connect/transition into MDPE (successful completion of this testing will increase the scope/range of application of the NuLine and similar products)
- Further assessment of the performance of the NuFlow product in relation to the requirements of the riser liner specification; due cogniscance given to (consistency of application, wall-thickness, adhesion, pressure loss, design life, etc.)
- Further Observation of operational processes which will enable the development of operational guidelines for implementation

Obtainment of qualitative and quantitative data and analysis for incorporation into policy documentation.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project will be deemed a success by providing:

- Successful completion of test programme and acceptance of outputs
- Successful execution of construction project
- Obtainment of qualitative and quantitative data from testing and site

Acceptance of updated policy documentation.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project is a small lab-based project which will also require data to be collected from site as the work progresses.

Technology Readiness at Start

TRL7 Inactive Commissioning

Technology Readiness at End

TRL7 Inactive Commissioning

Geographical Area

NGGD intend to use this technology across its gas distribution networks with particular emphasis on North London Network where there are a large volume of MOBs.

Revenue Allowed for the RIIO Settlement

nil

Indicative Total NIA Project Expenditure

External costs: Rosen	£91,304
External costs: Aquam/NuFlow	£5,740
Contingency @ 10%	£6,745
Internal costs @ 33.3%	£34,562
Total (£)	£138,531

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)

It is assumed that technology could give savings between 25-50% NGGD and equate to a saving of approximately £1M per annum but this number is predicated on being able to classify the product as permanent, which would maximise the scope of application and increase the penetration level of the product on the work stack.

Please provide a calculation of the expected benefits the Solution

Across NGGD's gas distribution networks, Typical MOB replacement costs were £13.6M in 2016/17 and this equate to an average cost per riser replacement of around £21k (648 risers replaced). It is assumed savings can be made in the region of 25-50% subject to clarification/maximisation of scope and competitive pricing being agreed with the Supplier.

By assuming a conservative saving estimate of %25 per riser (based on current costs for replacement) savings could be:

- For interim status, it is anticipated that the technology could be applied to 10% of the work stack (10% of 13.6M = 1.36M x %25) = £340k/annum

For permanent status, it is anticipated that the technology could be applied to 30% of the work stack (30% of 13.6M = 4.08M x %25) = £1.02M/annum.

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 could therefore potentially be rolled out across all GB Network Licensees.

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

Likely to be a bought-in specialist services provided by the GDSP.

Costs would be dependent on the scale set by the other Distribution Networks but it can be assumed that the mobilisation of any contract would be in the range of £250 - £500k per network (qualify).

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 closure report and associated technical documents will be shared with all Network Licensees.

The Project will provide a greater understanding of the technology which will in turn, be used to augment and improve the riser specification.

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