

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

Apr 2016

### Project Reference Number

NIA\_NGGD0073

## Project Registration

### Project Title

Multi-Occupancy Building Cured In Place Lining (NuFlow) trial

### Project Reference Number

NIA\_NGGD0073

### Project Licensee(s)

Cadent

### Project Start

March 2016

### Project Duration

1 year and 1 month

### Nominated Project Contact(s)

Joe McShane (Innovation Project Manager)

### Project Budget

£191,116.00

## Summary

The scope of the project is to test the performance of Nu Flow's small bore pipe lining/rehabilitation system in a series of field trials. The product will be measured in accordance with the recently delivered riser liner specification (NIA\_NGGD0055).

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

## Method(s)

The proposed solution will build on existing work completed to investigate the possibility of utilising a liner system that was developed in the water industry to line lead water pipes. It is believed this technology can be transferred to the UK Gas market to enable the remote lining of the internal pipe wall in multiple occupancy building risers.

NGG and the other GDNs have previously progressed work in this area and projects were completed to test epoxy liner products in a test environment and more recently, a specification was developed to support this technology.

The method would involve a small excavation being carried out at the base of the riser upright. Once the pipeline has been separated,

a calculated measure of grit (dependant on length and diameter), is blown through the pipeline in order to clean the internal pipe wall. This would quickly be followed by warm air to ensure the epoxy liner securely bonds to the internal pipe wall.

The epoxy liner would then be blown through the pipeline using forced air up through the riser into the customer's property. Any overspray from the liner material would be collected in a pre-designed collection devices so not causing unnecessary mess to the customers property.

## Scope

The scope of the project is to test the performance of Nu Flow's small bore pipe lining/rehabilitation system in a series of field trials. The product will be measured in accordance with the recently delivered riser liner specification (NIA\_NGGD0055).

Successful delivery of this project will build on work previously completed, providing learning as to how this technology can be applied practically. The data collected will also be used to augment the epoxy liner specification.

## Objective(s)

The objectives are:

- Assessment of the performance of the NuFlow product in relation to the requirements of the riser liner specification; due cognisance given to (consistency of application, wall-thickness, adhesion, pressure loss, design life, etc.).
- Observation of operational processes which will enable the development of operational guidelines for implementation
- Assessment of pressure loss; pre and post-lining
- Obtainment of qualitative and quantitative data which will improve the quality of the new liner specification
- If the pressure loss assessment determines that there is a significant effect post-lining, development of a pressure loss simulation model will be undertaken (equivalent lengths per component) which will enable the effects of the lining to be simulated.

## Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

## Success Criteria

- Successful performance of liner technology in accordance with the specification
- Investigate limits of technology
- Pressure loss assessment and creation of pressure loss methodology (if required)
- Better understanding of operational processes which can be used to develop operational guidelines.

## Project Partners and External Funding

n/a

## Potential for New Learning

n/a

## Scale of Project

Two trial sites in London have been identified. Both sites are medium rise MOB's and the existing systems were recently replaced.

The existing pipework has been left in-situ and is ideal for testing the liner technology. The pipework has been decommissioned and testing can be completed with minimal disruption to the customer.

## Technology Readiness at Start

TRL6 Large Scale

## Technology Readiness at End

TRL7 Inactive Commissioning

## Geographical Area

The trial sites are:

- 1 – 25 Hockley House, Morning Lane, London, E9 6RX

- The Weymarks, Weir Hall Lane, Tottenham, N17 8LE.

## **Revenue Allowed for the RIIO Settlement**

No direct savings will be achieved during project implementation but may be achieved in the future through application of the project outputs. The benefits will be better understood on completion of this project as there is limited information to support the limits of the product.

## **Indicative Total NIA Project Expenditure**

NGG:

External expenditure – £133,367.90

Total external with 10% contingency – £13,336.79

Internal expenditure – £44,411.51

Total NGGD expenditure – £191,116.20

## 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)

In the RIIO submission NGGD have planned £83.6m spend on replacement MOB's over 8 years, averaged over 5 makes £52.5m. It is assumed that technology could give savings between 25-50% NGGD alone could have potential savings between £13m and £26m.

#### Please provide a calculation of the expected benefits the Solution

Typical MOB replacement costs are approximately £10k. It is assumed savings can be made in the region of 25-50%, therefore, equating to savings between £13m and £26m.

#### 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.

### 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 trialed 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 end of Project report 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)

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

- 170 buildings over 5 years is approximately 34 per year
- 34 per 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. NGGD 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 per year
- 1,443 a year is approximately 1% total population per annum (of medium rise buildings with a riser)

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

- 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