

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

Jan 2014

### Project Reference Number

NIA\_NGGD0008

## Project Registration

### Project Title

Internal Stress Corrosion Cracking (ISCC) Assessment Work

### Project Reference Number

NIA\_NGGD0008

### Project Licensee(s)

Cadent

### Project Start

March 2013

### Project Duration

1 year and 4 months

### Nominated Project Contact(s)

Bob Owen and Darren White (NGGD)

### Project Budget

£127,595.00

## Summary

The scope of this project is a pilot study, incorporating the following deliverables:

- Obtain pipe sections from the Lamesley array and transport them to GL Noble Denton's Spadeadam test facility
- Undertake an internal inspection using MPI of 6 off girth welds retrieved from Lamesley
- Identify the gas manufacturing processes associated with Lamesley since its construction
- Summarise the different gas manufacturing processes used historically in the UK, from 1950 to conversion to natural gas
- Where possible, identify which transmission pipelines were fed by which gas manufacturing process
- Develop an ISCC threat assessment algorithm, and provide guidelines to identify the position(s) along the pipeline route where ISCC is most likely.

### Nominated Contact Email Address(es)

Innovation@cadentgas.com

## Problem Being Solved

High pressure pipelines that were previously used to transport manufactured gas (e.g. town gas or reformer gas) can be subject to Internal Stress Corrosion Cracking (ISCC).

There are currently no practicable industry guidelines for identifying whether a pipeline has the potential to contain ISCC and to assess the significance of any cracking found, this project will assess the extent of the threat of ISCC to the pipelines owned and operating by the participating GDN's, which will enable the requirements and benefits of further research to be confirmed.

## Method(s)

This project will undertake internal inspection of pipe samples retrieved from Lamesley to confirm the presence of ISCC and use the results to develop a threat assessment algorithm to enable identification of those pipelines that are most likely to contain ISCC, along with guidelines to identify where along the pipeline route that the ISCC would most likely be located.

## Scope

The scope of this project is a pilot study, incorporating the following deliverables:

1. Obtain pipe sections from the Lamesley array and transport them to GL Noble Denton's Spadeadam test facility;
2. Undertake an internal inspection using MPI of 6 off girth welds retrieved from Lamesley;
3. Identify the gas manufacturing processes associated with Lamesley since its construction;
4. Summarise the different gas manufacturing processes used historically in the UK, from 1950 to conversion to natural gas;
5. Where possible, identify which transmission pipelines were fed by which gas manufacturing process;
6. Develop an ISCC threat assessment algorithm, and provide guidelines to identify the position(s) along the pipeline route where ISCC is most likely.

## Objective(s)

The aim of this project is to understand and develop a method to assess the threat of internal stress corrosion cracking (ISCC) in pipelines previously used to transport manufactured gas.

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

n/a

## Success Criteria

Success of this project will be the development of a methodology to identify whether a pipeline has the potential to contain ISCC. In addition this should provide information on the different types of manufactured gas, and identify, where possible, which areas manufactured what type of gas in the UK.

## Project Partners and External Funding

n/a

## Potential for New Learning

n/a

## Scale of Project

The scope of this project is a pilot study, currently there are no practicable industry guidelines for identifying whether a pipeline has the potential to contain ISCC and to assess the significance of any cracking found. This project will assess the extent of the threat of ISCC to the pipelines owned and operated by the participating GDNs, which will enable the requirements and benefits of further research to be confirmed.

## Technology Readiness at Start

TRL2 Invention and Research

## Technology Readiness at End

TRL3 Proof of Concept

## Geographical Area

Lamesley and Spadeadam for sample testing – North East

## Revenue Allowed for the RIIO Settlement

Revenue allowed for in the RIIO Settlement totals £349m, savings on this have not been allowed for due to the

current low TRL.

## **Indicative Total NIA Project Expenditure**

### WWU

£9,750 IFI Project expenditure  
£28,083 NIA Project expenditure  
£37,833 total Project expenditure

### NGGD

£10,785 IFI Project expenditure  
£31,810 NIA Project expenditure  
£42,595 total Project expenditure

### SGN

£5,735 IFI Project expenditure  
£19,495 NIA Project expenditure  
£25,230 total Project expenditure

### NGN

£9,750 IFI Project expenditure  
£12,187 NIA Project expenditure  
£21,937 total Project expenditure

## 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 the problem is solved, GDNs will be able to assess risk more effectively and create improved integrity management plans. As a result the project will minimise the likelihood of any future failures as a result of this cause, and has the potential for savings on expenditure associated with such failures. The potential savings will therefore vary on a case by case basis.

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

Not required (Research only)

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

This Method could be applied across the whole of GB, as there are currently no practicable industry guidelines for identifying whether a pipeline has the potential to contain ISCC, and to assess the significance of any cracking found.

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

£50k estimate to update high pressure pipeline integrity risk assessment model, per Network Licensee.

### 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

Learning from the study will inform relevant Network Licensees regarding the extent of the threat of ISCC to the pipelines owned and operated by the participating Network Licensees, which will enable the requirements and benefits of further research to be confirmed.

### Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

Not applicable – learning can be applied by all Network Licensees therefore please refer to i) above.

- 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