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 2014

Project Reference Number

NIA_NGGD0021

Project Registration

Project Title

Alternative Riser Pipe Jointing Method - Pyplok

Project Reference Number

NIA_NGGD0021

Project Licensee(s)

Cadent

Project Start

April 2014

Project Duration

2 years and 1 month

Nominated Project Contact(s)

Neil Russell – Project Manager and Andy Newton - Innovation Portfolio Manager

Project Budget

£566,133.00

Summary

The scope of this project includes:

- Review current information regarding the Pyplok system
- Define functional requirements of alternative steel fittings for use on gas riser systems, such as Pyplok
- Conduct approval testing of Pyplok
- Field trial Pyplok

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

Currently there are only two approved methods of jointing steel pipework in low pressure metallic riser systems; welding and screwed joints. Screwed joints can only be used in situations up to 2” in diameter, and so for many high rise buildings the only option is to weld pipework. Welding is both costly and risky; the cost mainly comes from the need to hire in specialist welders to undertake the work, and due to the risks of welding inside buildings hot work permits need to be completed, which also increases job duration. Screwed joints, although cheaper, are the cause of the majority of gas escapes within multi-occupancy buildings, as they can become loose over time and start passing gas, which has safety implications if not reported and fixed in a timely manner.

This project seeks to conduct a review of the existing Pyplok technology which is currently used in many pipe based industries, but is

currently unproven for use on the UK gas distribution network. Pyplok is a potential alternative method of jointing with potential benefits including improved safety due to removed need for hot work inside buildings, removed need for hot work permits, and cost savings resulting from the removed need for pipe fabricators/welders.

Method(s)

This project will conduct a review of the existing Pyplok technology which is currently used in many pipe based industries and to establish its suitability for the application of an alternative jointing method for steel risers. The project will also ascertain the testing which is required to ensure that the product is fit for purpose.

Scope

The scope of this project includes:

- Review current information regarding the Pyplok system
- Define functional requirements of alternative steel fittings for use on gas riser systems, such as Pyplok
- Conduct approval testing of Pyplok
- Field trial Pyplok

Objective(s)

The aim of this project is to assess Pyplok technology to establish its suitability for the application of an alternative jointing method for steel risers, which removes the need for welding (which requires hot work permits) or screwed fittings which can only be used up to 2" diameter. The project will ascertain the testing which is required to ensure that the product is fit for purpose.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Success of the project will be the passing of approval testing of Pyplok technology, as an alternative jointing method for riser pipe work, which removes the need for welding (which requires hot work permits) or screwed fittings which can only be used up to 2" diameter.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This project will be carried out over 4 stages covering the following elements:

- To establish functional requirements that the Pyplok fitting must comply with to ensure its integrity when used on steel gas riser systems in the UK.
- To conduct gap analysis between current certification and performance requirements. Any gaps in the Standards currently available will also be identified.
- To address gaps identified during gap analysis and to make a final recommendation on the suitability of the Pyplok product and process (subject to modifications as identified) to proceed to Field Trial Evaluation.

Field trial evaluation and conclusion s reported

Technology Readiness at Start

TRL5 Pilot Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

GL offices – Loughborough, Leicestershire and at Spadeadam test site.

Revenue Allowed for the RIIO Settlement

NGG plan to spend approximately £80m over RIIO on riser replacement.

Indicative Total NIA Project Expenditure

£566,133 Total NIA 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)

Initial indications show up to 60% potential cost savings against traditional welding techniques.

For the use of Pyplok instead of screwed joints indications show that the cost benefits will be less to that over welding, however there are significant safety and external risk benefits, resulting in associated financial benefits to customers.

Project Benefits Rating 8/25

Please provide a calculation of the expected benefits the Solution

It is not possible to determine the cost savings at this stage. If Pyplok is deemed suitable as an alternative riser jointing system then further work will be undertaken to fully realise the cost saving over traditional welding techniques. However the following assumptions are being used until they can be refined in the project.

Costs submitted in RIIO planned to spend £83m over RIIO on riser replacement; this is approximately £10m a year. Possible alternative approaches include replace with PE riser system or remediate with CIPP.However, assume that the majority of the £10m proposed spend ie £6m would be on high rise and therefore not screwed construction and assume unsuitable for remediation or PE riser system potential savings of up to and approximately £3m savings a year are possible from finding an alternative to welded construction of riser systems.

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

The method is replicable for alternative jointing for all steel risers.

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

Costs to roll out would include the cost of the swaging tool and associated equipment, cost of training and costs associated with introducing new stock of fittings. The product will also have to undertake field testing which will incur a cost. The exact amount for roll out costs is to be confirmed.

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

If the product is found to be a successful alternative to welding of riser pipework then the other Gas Distribution Networks could also use this learning themselves to go about approval of the product for use on their 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)

Not applicable

☑ 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