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

Jul 2017

Project Reference Number

NIA_CAD0005

Project Registration

Project Title

Resin-based Gas Distribution Pipe Replacement

Project Reference Number

NIA_CAD0005

Project Licensee(s)

Cadent

Project Start

June 2017

Project Duration

0 years and 7 months

Nominated Project Contact(s)

Cadent: Programme Manager - Brian Tilley; Project Manager – Satwant Sarkaria

Project Budget

£60,446.00

Summary

The project will be split into three distinct areas: Service pipe development; mains pipe development; and connectivity to other parts of the gas distribution network. These will go towards solving highlighted issues in the current PRISM and BAE processes. The areas of investigation and development will be broad with sound solutions being brought forward as project deliverables.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

Cadent is seeking to utilise technologies which can deploy resin-based materials in both gas mains and services to create a homogenous, fully structural, method of replacing our steel / iron legacy network. A series of NIA-funded projects, undertaken in the period 2014-17, has achieved significant progress in many key areas, enabling the progress of some solution components to TRL levels 5/6. However, there are several areas in which significant technical challenges still remain and no technically or commercially viable solutions have yet been identified. Hence, in order to complete the development and delivery of a holistic commercial solution, Cadent believes it is necessary to independently determine the limits of use of the technologies utilised in the project to date, and determine how these could be extended or overcome. In addition, as part of the proposed work, any potential new technologies, drawn from not only the utilities sector but also other relevant sectors, would be identified and the relevant suppliers would join the collaboration team to deliver a commercial solution for the industry.

Method(s)

Cadent are seeking to utilise a growing relationship with the Manufacturing Technology Centre (MTC) - part of the High Value Manufacturing Catapult, supported by Innovate UK – to undertake this project. The MTC develop innovative manufacturing processes and technologies in partnership with industry, academia and other institutions. This project will leverage the MTC's technical know-how in a bid to overcome the remaining challenges, keeping the PRISM Programme technically, commercially and operationally viable, and

facilitate continuation of the development and testing activities through increasing TRL levels.

Scope

The project will be split into three distinct areas: Service pipe development; mains pipe development; and connectivity to other parts of the gas distribution network. These will go towards solving highlighted issues in the current PRISM and BAE processes. The areas of investigation and development will be broad with sound solutions being brought forward as project deliverables.

Objective(s)

Service pipe development:

- Investigate BAE improvements and alternative resin deposition methods
- Investigate service to mains connections
- Identify in-process inspection methods for service pipes

Mains pipe development:

- Investigate joint filling methods
- Investigate PRISM pipe to PE pipe connections
- Identify in process inspection methods for main pipes

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Satisfactory evidence that conceptual solutions have been identified and modelled (with physical proofs of concept developed where appropriate) to enable such solutions to be taken forward into the broader, ongoing, PRISM/BAE programme of work, leading to a technically, commercially, and operationally viable pipe replacement system.

The MTC will produce specific deliverables, for review and approval by Cadent, to include 3D CAD models supported by existing technologies to illustrate the concepts put forward.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This project will identify solutions to facilitate continuation of Cadent's PRISM/BAE pipe replacement innovation programme for use on Tier 1 (3"-8") mains and associated services. The outcome of this project, and the impact on the wider programme, will be shared with the other GDNs.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The proposed works will be undertaken in Cadent's offices in Hinckley and MTC's offices in Coventry.

Revenue Allowed for the RIIO Settlement

Tier 1 mains replacement/risk removal under Efficient and Safe Work Delivery and Removal of Risk.

Total Repex in allowance = £3.2bn.

Allowances as per Ofgem RIIO-GD1 Final Proposals and all figures are in 2009/10 prices.

Indicative Total NIA Project Expenditure

Total £60,446.50

External - £44.790

Internals - £11.197.50

Contingency - £4,479

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)

This project will not, in itself, deliver industry benefits. However, successful completion of this project will significantly progress the development and delivery of a strategic pipe replacement technology.

Rollout costs for the overall programme (not this project) will consist of equipment purchase or hire, training costs and the cost of any required changes to relevant national or local policy for this work type. All costs will vary with the level of take up both locally within each GDN and from a national perspective.

It is expected that these costs will be significantly outweighed by the benefits but an exact figure is difficult to propose at this stage due the variables highlighted.

Please provide a calculation of the expected benefits the Solution

N/A

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

The exact area in which these technologies could be deployed would be subject to a review by each GDN as the pipeline would need to be clear of obstructions. It is expected that only mains pipes suitable for insertion replacement would be appropriate for the use of PRISM, however there is an opportunity to use the BAE technology (for services) in isolation, connecting to a conventional PE main.

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

The costs of roll out are unknown at present as the exact technical solutions to be utilised are in development.

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

This trial will inform the ongoing development of PRISM, if successful it could be used by all networks as an alternative option to insertion or replacement of pipes.

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

Seeking to overcome the technical challenges experienced to date in the deployment of resin-based materials in gas mains and services to create a fully structural method of replacing our steel / iron legacy network.

☑ 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