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

Mar 2016

Project Reference Number

NIA_NGGD0077

Project Registration

Project Title

PRISM (Pipe Replacement in situ Manufacturing) – Above Ground Trial

Project Reference Number

NIA_NGGD0077

Project Licensee(s)

Cadent

Project Start

March 2016

Project Duration

0 years and 7 months

Nominated Project Contact(s)

NGGD Project Manager – Sharon Harrison

Project Budget

£118,545.00

Summary

Above ground trials of various technical solutions in a yard environment will be carried out, by deploying them in pipe and applying PRISM. The samples will then be inspected and tested by an independent consultant and a report issued.

A number of 25m runs of pipe will be subjected to PRISM application and 5m of technical solution testing, samples will then be taken for inspection and testing to derive the applied resin thickness profile along the length of the test sample.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

Current methods of replacing gas distribution mains are costly and disruptive to customers and road users. This initiative seeks to determine a method of achieving the outputs of mains replacement more efficiently.

Utilising PRISM, the renewal of mains within a street could be possible via an excavation at each end of the street. This would result in a reduction in cost and effort, improved safety, environmental benefits through reduced waste to landfill and reduced customer and third party disruption, leading to improved customer satisfaction.

Method(s)

This project will build on recent work outside of the NIA and has brought together suitable project partners and delivered a proof of concept method of applying a polymer to the inside of pipes with potential to satisfy gas industry requirements. Other similar projects have been undertaken over the past 10 years. The most successful of these being project FORGE; a scheme managed by both National Grid and Balfour Beatty. FORGE developed a process to rehabilitate gas mains through a replacement/rehabilitation technology previously adopted by the water sector.

This phase of work is to further the development of the PRISM (Pipe replacement in situ manufacturing) technique, by identifying, developing and testing various technologies to solve specific technical challenges that gas mains present that are not faced in water mains.

Scope

Above ground trials of various technical solutions in a yard environment will be carried out, by deploying them in pipe and applying PRISM. The samples will then be inspected and tested by an independent consultant and a report issued.

A number of 25m runs of pipe will be subjected to PRISM application and 5m of technical solution testing, samples will then be taken for inspection and testing to derive the applied resin thickness profile along the length of the test sample.

Objective(s)

- To derive and demonstrate the thickness profile and variation of the applied resin over a 20m length of 4” and 6” pipe to determine the distribution curve over the length.
- To demonstrate the suitability and test identified solutions for dealing with joints, other features such as ferrules, termination of PRISM in the existing main and determine their effect on the distribution of PRISM application.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- A demonstrated profile of PRISM application that can be used to determine the settings needed to maintain the minimum thickness required when in use on the network to ensure consistent structural strength along any applied length.
- A completed process of selection on which products to proceed with to the next stage to solve the technical challenges such as joint spanning and end mains connection.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This project is a trial of technical solutions to enable PRISM application on a 4” and 6”main, an output report will be written which will influence further stages of the project and can be shared with the other GDNs.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL6 Large Scale

Geographical Area

The yard trials will be carried out in Thurnscoe, Yorkshire with the testing in Newcastle upon Tyne.

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

£ 98,909 total external spend (including contingency), split across all parties.

Total National Grid NIA Spend (including Internals and contingency) £118,545

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)

Rollout costs 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.

It is estimated that if 30% utilisation of PRISM can be achieved at a production rate of 400 metres per week then potentially a saving of £5.144m could be realized on the NGGD area.

Please provide a calculation of the expected benefits the Solution

The estimated costs of PRISM and Blown Air Extrusion as a combined technique would be £24 per metre less than traditional combined insertion. At a production rate of 400 metres per week. At 30% utilisation could potentially give a benefit of £5.144m per annum, at 100% utilisation it will give a benefit of £17.147m.

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

The exact area in which PRISM 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 pipes suitable for insertion replacement would be appropriate for the use of PRISM.

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)

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

- [x] Yes