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

Aug 2016

Project Reference Number

NIA_NGGD0082

Project Registration

Project Title

Blown Air Extrusion (BAE) – Proof of Concept 3

Project Reference Number

NIA_NGGD0082

Project Licensee(s)

Cadent

Project Start

September 2016

Project Duration

1 year and 3 months

Nominated Project Contact(s)

NGGD Project Manager – Satwant Sarkaria

Project Budget

£417,978.00

Summary

The scope of work includes trials in a controlled yard environment of various technical solutions. The trial will involve deploying the solutions in the pipe and applying BAE.

The tasks to be covered include:

- Task 1 - Ability to establish BAE / PRISM connection
- Task 2 - Suitability of transition fittings
- Task 3 - Emergency isolation
- Task 4 - Repair fittings
- Task 5 - Service Transfers
- Task 6 – Reporting
- BAE Rig to facilitate all of the above trials

The samples will then be inspected and tested by an independent consultant and a report issued detailing the findings and which solutions have successfully passed tests to proceed to a future trial combined with PRISM (Pipeline in Situ Manufacturing).

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

Current methods of replacing gas distribution services are costly and disruptive to customers and road users. This BAE initiative

seeks to determine a method of achieving the outputs of service replacement to mains connection with increased customer satisfaction and whilst being quicker and cheaper than current methods.

The renewal of services and a no-dig connection to the main within a street could be possible and this would result in reduced 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 to deliver a proof of concept method of applying a resin to inside of service pipes suitable for a fully structural solution and connect with the mains resin (PRISM) with potential to satisfy gas industry requirement. This project is to review those achievements and identify a strategic and practical approach to delivering a working solution.

This phase of work is to further the development of the BAE (Blown Air Extrusion)

technique, by identifying, developing and testing various technologies to solve specific technical challenges that gas services present

Scope

The scope of work includes trials in a controlled yard environment of various technical solutions. The trial will involve deploying the solutions in the pipe and applying BAE.

The tasks to be covered include:

- Task 1 - Ability to establish BAE / PRISM connection
- Task 2 - Suitability of transition fittings
- Task 3 - Emergency isolation
- Task 4 - Repair fittings
- Task 5 - Service Transfers
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The samples will then be inspected and tested by an independent consultant and a report issued detailing the findings and which solutions have successfully passed tests to proceed to a future trial combined with PRISM (Pipeline in Situ Manufacturing).

Objective(s)

- To demonstrate the ability to perform various connection scenarios, to include; BAE to PRISM, BAE to existing PE system and the suitability of transition fittings.
- To demonstrate, and document repair and emergency isolation procedures and prove the suitability of the system.
- To undertake pressure drop measurements across simulated transferred service prior to and following BAE application.
- To collate preliminary safety documentation to ensure that all required data is available to take the project forward into live trials.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Satisfactory evidence to support the service replacement to main connection technique and results that enable us to continue to the next steps towards a commercial solution.

- Technical report that demonstrates
  - Service Only Solution – The project must demonstrate an acceptable gas-tight solution to include:
    - Mechanical connection to the ECV
    - Mechanical connection at the footpath
    - Service pipe itself
  - Service to Main Solution - The project must demonstrate an acceptable gas-tight solution to include:
    - Mechanical connection to the ECV
    - Service pipe itself
    - Chemically bonded BAE connection to the PRISM main

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 BAE application on a ¾" and 1 services 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 trial sites are in Wrexham

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

£174,654 total external spend (including contingency), split across all parties.

Total National Grid NIA Spend (including Internals and contingency) £218,317

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.

Please provide a calculation of the expected benefits the Solution

The estimated costs of PRISM and Blown Air Extrusion as a combined technique could give a total benefit of £0.352m in the RIIO period.

Additional benefits are anticipated when PRISM is combined with Blown Air Extrusion (BAE) service replacement, BAE is not part of this project but part of the overall programme.

The assumptions for production rates, usage and materials costs have a high level of uncertainty at this time and therefore these estimates are indicative.

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

☑ Yes