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 2015

Project Reference Number

NIA_NGGT0073

Project Registration

Project Title

Investigation into LPRC pipeline material

Project Reference Number

NIA_NGGT0073

Project Licensee(s)

National Gas Transmission PLC

Project Start

July 2015

Project Duration

1 year and 10 months

Nominated Project Contact(s)

Cor Bos

Project Budget

£109,815.00

Summary

NIA project NIA_NGGT0048 recently provided National Grid with a high level review of alternative materials and construction methods for potential use on the gas transmission system, herein after referred to as Phase 1. The Phase 1 report identified LPRC in principle as the best candidate technology for pipelines from those considered, and concluded that the technology is potentially suitable for use in high pressure, large diameter gas transmission applications. A small number of particular products on the market or use in the industry abroad were identified , but have a limited track record of performance testing and limited and/or unreported history in field applications. Phase 2 therefore makes a more detailed and comprehensive review of the feasibility of future use of LPRC and of these specific products.

Preceding Projects

NIA_NGGT0048 - Feasibility Study for Alternative Pipeline Materials

Third Party Collaborators

ROSEN

Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

Problem Being Solved

This project is a follow up phase of work to investigate in more detail the feasibility of using alternative materials identified previously, specifically Linepipe Reinforced with Composite (LPRC) for transmission pipelines.

Method(s)

Phase 2 aims to further assess products identified in Phase 1 through the following tasks:

This project aims to perform a comprehensive technical assessment of short listed LPRC products based on information sourced from suppliers and relating to high pressure gas transmission applications. It will also clearly define the minimum performance requirements for LPRC products used on the gas transmission system.

- Task 1 – LPRC Product Review and Evaluation
- Task 2 – Full Life Cost Benefit Analysis and Environmental Assessment
- Task 3 – Development of Performance Requirements
- Task 4 – Gap Assessment and Technical Review of Data

This change control is required to give the project more time to complete all above tasks. Progress has been impacted by the difficulty in obtaining comprehensive technical data about the proprietary LPRC products to inform the various tasks. Consequently, a review of task interdependency and re-planning of the remaining tasks led to a £18.6k reduction in total cost of the project.

Scope

NIA project NIA_NGGT0048 recently provided National Grid with a high level review of alternative materials and construction methods for potential use on the gas transmission system, herein after referred to as Phase 1. The Phase 1 report identified LPRC in principle as the best candidate technology for pipelines from those considered, and concluded that the technology is potentially suitable for use in high pressure, large diameter gas transmission applications. A small number of particular products on the market or use in the industry abroad were identified , but have a limited track record of performance testing and limited and/or unreported history in field applications. Phase 2 therefore makes a more detailed and comprehensive review of the feasibility of future use of LPRC and of these specific products.

Objective(s)

Phase 2 aims to provide a comprehensive market review of LPRC products, define specific performance requirements relating to the operation and management of such technology and undertake a detailed assessment of product suitability including Full Life Cost Benefit Analysis and Environmental Assessment.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

To develop performance requirements specific to the use of LPRC technologies to enable a comprehensive assessment of product suitability Full Life Cost Benefit Analysis and Environmental Assessment.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

A desk based project which will identify all available information on LPRC, develop performance criteria and gap assess current product information.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

The project is a desk based study taking place at the supplier’s office in the UK.

Revenue Allowed for the RIIO Settlement

None **(to be confirmed RIIO Delivery)**

Indicative Total NIA Project Expenditure

£109,815

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)

National Grid is looking to reduce pipeline unit costs through the use of new technology. There is a 55% sharing factor on any savings below the agreed unit cost price, hence efficiencies are transferred through to the customer. Given the low TRL, it is not expected that new technologies such as composite linepipe on the NTS would be in place before the start of RIIO T2. Assuming National Grid lay 60km per annum of new pipe over the 8 year period, at the agreed unit cost for pipelines over the RIIO period, the total cost is over £800m. A target reduction of 10% (both savings from materials, normally 25% of the overall project cost, and reduced costs from the main works contractor through easier handling and reduced time onsite) would equate to savings in the region of £10m per annum.

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 Method will consider LPRC products suitable for use across the entire transmission pipeline network, is also applicable to high/medium pressure distribution network pipelines, and considers new pipelines, replacement pipelines and diversions. Therefore estimated to be applicable to 100% of Network Licensees.

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

Unknown at this stage due to low TRL of the technology, this project will allow a better understanding of the possible cost. It is expected that there would be a decrease in costs incurred on pipeline construction projects due to cheaper pipeline material costs and easier handling of composite pipe sections.

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 generated on novel construction practices in particular could be of benefit to both high pressure pipelines and medium pressure tier pipelines within gas transmission and distribution 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)

This project is aligned to the strategic theme.

☑ 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