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

Jun 2018

Project Reference Number

NIA_NGGT0130

Project Registration

Project Title

European Pipeline Research Group 2018

Project Reference Number

NIA_NGGT0130

Project Licensee(s)

National Gas Transmission PLC

Project Start

April 2018

Project Duration

1 year and 1 month

Nominated Project Contact(s)

Rob Bood (NGGT) & Luke Hollis (Cadent Gas)

Project Budget

£99,000.00

Summary

The European Pipeline Research Group (EPRG) undertakes a wide range of research directed towards the increased integrity and safety of gas transmission pipelines. Topics such as corrosion, fit-for-purpose assessment, and pipeline rehabilitation constitute the major areas of concern for existing pipelines. Whereas areas of concern for new pipelines, in the ever-expanding European gas transmission grid, such as the use of higher strength steels and higher hoop stress factors, provide new challenges and opportunities for cost-effective pipeline construction and operation.

Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

Problem Being Solved

The European Pipeline Research Group (EPRG) undertakes a wide range of research directed towards the increased integrity and safety of gas transmission pipelines. Topics such as corrosion, fit-for-purpose assessment, and pipeline rehabilitation constitute the major areas of concern for existing pipelines. Whereas areas of concern for new pipelines, in the ever-expanding European gas transmission grid, such as the use of higher strength steels and higher hoop stress factors, provide new challenges and opportunities for cost-effective pipeline construction and operation.

Collaboration on international research programmes, through industry bodies such as EPRG, is essential to ensure we benefit from leveraged research. Continued participation in EPRG enables the project partners, National Grid and Cadent Gas, to develop a breadth and depth of knowledge that can only be realised through leveraged research programmes.

Method(s)

EPRG's enduring mission is to use the combined expertise of gas transmission and pipe manufacturing companies to address

common issues concerning the technical integrity of gas transmission pipelines in the fields of pipe manufacturing, pipeline design, construction, operation and maintenance.
To achieve this, EPRG will:

- Identify methods and practices for improving the integrity of existing and new pipelines and protecting health, safety and the environment.
- Establish research programmes in response to the needs and priorities of the member companies using the services of contractors which are "best-in-class" in the relevant areas of expertise.
- Develop recommendations and guidelines based on the results obtained. Promote the acceptance and implementation of the recommendations and the guidelines.

The research work conducted by EPRG is established by a Plenary Group, and managed by three technical committees; Corrosion, Design and Materials.

The exchange of experience among the member companies and with other relevant institutions is an important feature of the EPRG activities. For example, a regular exchange of research results is shared with the Pipeline Research Council International (PRCI) and Australian Pipeline Industry Association (APIA) at joint EPRG/APIA/PRCI biennial meetings.

Scope

Participation in EPRG provides National Grid and Cadent Gas with the ability to access research projects that may otherwise be more difficult to fund on an individual basis, as well as the opportunity of validating work carried out on internal programmes.

There are extensive networking opportunities with other gas transporters and across the wider industry. Collaboration through this organisation will continue to play a key role in the innovation portfolio.

There are 18 relevant projects currently underway at EPRG for the 2018 programme, and it is anticipated that several new projects will be initiated during the course of the year. Projects listed below that are of particular interest to National Grid and Cadent Gas have been identified by an asterisk (*):

EPRG Project Code – Project Title
163a* – Long term resistance to adhesion loss of 3 layer polyolefin coatings.
166* – Low bond line toughness in HFW pipe. [166]
176 – ISO 15156 Activities on HIC testing.
180* – Determination of chemical composition by mobile optical emission spectroscopy.
184* – Time dependent behaviour – full scale testing.
185* – EPRG projects library.
188 – Assessment of mitre welds.
190* – Follow up round robin test – HFW bond line testing.
191* - Analysis of results of six time dependent burst tests (EPRG 184)
192 – Revision of the EPRG guidelines for crack arrest.
193 – SCC resistance of TMCP line pipe: SCC testing – Limits of existing standards
194 - SCC resistance of TMCP line pipe: SCC testing – NDT to identify hardened surface areas
195 - SCC resistance of TMCP line pipe: SCC testing – Possible hard layer formation
195a - SCC resistance of TMCP line pipe: SCC testing – Possible hard layer formation
196* – Effect of cathodic overprotection – Extension of 174
197 – West Jefferson tests – Extension of 171
198 - West Jefferson and DWT tests – Extension of 172
199* – Support EPRG project library

As has been identified above, new projects are anticipated to be initiated during the course of the year.

Objective(s)

National Grid and Cadent Gas want to continue to establish best practice technologies and techniques in order to allow the safe, reliable, efficient and economic use of the gas network, while reducing impact on the environment. By participating in EPRG, National Grid and Cadent Gas have benefitted, and will continue to benefit from the international experience of the other member companies' representatives, while benefiting from significant leverage on project activity from the other member companies.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project partners, National Grid and Cadent Gas, assess the collaboration with EPRG through individual projects against the ability to develop improvements to how we build, manage and operate the National Transmission Network (NTS).

Success is also determined by the level of influence we are able to exercise on each research programme, as well as the financial leverage available compared to self funding the research.

Project Partners and External Funding

EPRG is a cooperation of European pipe manufacturers and gas transmission companies. It comprises around 20 member companies, from 9 European countries with a group budget of approximately 2 million Euros/year.

Potential for New Learning

Collaboration on international research programmes, through industry bodies, is essential to ensure we benefit from leveraged research. The programmes we participate in will allow National Grid and Cadent Gas to develop new learning for specific challenges we face on the NTS. For example reducing the unit costs of pipelines through researching new materials, and to understand and benefit from the research on the challenges other operators are facing which we may experience in the future. Without these leveraged research programmes we would not be able to develop the breadth and depth of knowledge that these afford. Learning from relevant projects is briefed out to technical staff through workshops. For example, on developments on fracture toughness testing, girth weld defect acceptance criteria and external coatings.

A list of the research undertaken through EPRG will be published on our websites. This practice allows interested parties to engage with our technical experts via industry workgroups to access the learning gained.

Publications are made available on the EPRG website (http://www.eprg.net/home), where there is a specific section on Publication and dissemination of information. “The publication and dissemination of the results, recommendations and guidelines emanating from EPRG's research has always been an important activity. EPRG regularly publishes research results, recommendations and guidelines in journals and at conferences, enabling the findings to be subjected to critical peer review and made available to the wider pipeline industry”.

Learning is also disseminated through industry journals and international conferences. Technical papers are submitted and presented at international conferences such as the International Pipeline Conference (IPC) which is held every two years and is open to all interested parties who wish to attend.

Scale of Project

The range of EPRG projects are varied in scale, from small surveys and desk based studies to full scale destruction testing. As previously indicated, the key benefit of EPRG is in the opportunity for National Grid and Cadent Gas to use the leverage of the multi-party programmes to execute full scale tests, using the knowledge, equipment and assets of other operators to validate models in a way that would not be possible through a project funded purely by one business.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

The results from this project will be applicable across gas networks throughout Great Britain and the world.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

Annual NIA spend: £99k
NGGT contribution: £56k
Cadent Gas contribution: £43k

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)

The benefits of participating in these European leveraged projects will enable National Grid and Cadent Gas to develop and implement best practice for a fraction of the full cost.

Examples of completed projects include:

- Discrete parts of the delayed failure projects
- Long term resistance to adhesion loss
- Environmental effects on mechanical damage
- Steel properties of old pipelines
- Model for pipeline damage.

Many of the projects of particular interest are on-going:

- The remainder of the delayed failure under constant pressure
- Performance of 3-layer PE coatings
- The assessment of bending wrinkles
- Low bond line toughness
- EPRG project library

Chemical composition by MOES.

Please provide a calculation of the expected benefits the Solution

N/A - Research

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

Knowledge from participation in the various international innovation programmes is applicable across GB gas transmission and distribution networks. For example research on pipeline materials and third party damage.

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

Roll out costs are entirely dependent on project specific details. But it estimated that any costs incurred are likely to be less than £100k, as in many cases the results of a specific project may be used to improve our knowledge base thereby avoiding unnecessary future expenditures.

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 will be used to direct future developments into the most promising areas and, where applicable, to update policies and standards. This will allow the research results generated to be applied to our network.

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

Knowledge from this project will address many areas identified in the Innovation Strategy including safety, reliability, environment and strategic issues.

☑ 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.

The essence of this project is designed to avoid international duplication, therefore National Grid and Cadent Gas is confident that there is no unnecessary duplication. EPRG is an international collaboration of gas transmission companies to undertake research of common interest and benefit to multiple members. Member companies and the EPRG committees consider and review proposals from all members for new projects and interact regularly with other relevant institutions such as PRCI and national research groups of the member countries. Thus ensuring that any duplication of previous work is avoided.

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

The collaborative approach allows for access to wider aspects of research and development such as full scale testing that could not be funded solely through an individual business. This approach maximises the chance of successful innovations being developed for the long term benefit of customers, and hence we believe continued collaboration provides excellent value to customers.

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

The low TRL of the areas under consideration means that the work cannot be categorised as business as usual and there is a risk that research may be unsuccessful or identify unforeseen technical, commercial or regulatory barriers to development of effective implementations into business as usual by the network licensees. Due to this risk we believing NIA is the appropriate funding mechanism. Further, EPRG participation also provides high leverage for the NIA contribution.

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

For this project, the NIA contribution by the two network partners is ~16% of the EPRG annual funding from an estimated 22 members, giving a leverage of 10:1. Therefore, the funding contribution sits below the limit of 25% of the total EPRG project cost (~£600k). The learning from these innovation projects is used to update industry standards hence it is critical for the UK gas industry to be in a position to drive and influence the project direction and output.

This project has been approved by a senior member of staff

☑ Yes