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

May 2020

Project Reference Number

NIA_NGGT0161

Project Registration

Project Title

EPRG (European Pipeline Research Group) 2020

Project Reference Number

NIA_NGGT0161

Project Licensee(s)

National Gas Transmission PLC

Project Start

May 2020

Project Duration

0 years and 11 months

Nominated Project Contact(s)

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

Project Budget

£90,327.00

Summary

EPRG membership subscription

Preceding Projects

NIA_NGGT0005 - European Pipeline Research Group (EPRG)

NIA_NGGT0062 - EPRG - European Pipeline Research Group -2014

NIA_NGGT0106 - European Pipeline Research Group 2016

NIA_NGGT0120 - European Pipeline Research Group 2017

NIA_NGGT0130 - European Pipeline Research Group 2018

NIA_NGGT0151 - EPRG (European Pipeline Research Group) 2019

Third Party Collaborators

European Pipeline Research Group (EPRG)

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 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 grid, such as the use of higher strength steels and higher hoop stress factors, and new fluids 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 allows National Grid and Cadent Gas to develop a breadth and depth of knowledge that can only be realised through leveraged research programmes, providing maximum cost effectiveness to the customer.

Method(s)

EPRG's enduring mission is to use the combined expertise of gas and pipe manufacturing companies to address common issues concerning the technical integrity of gas 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 Pipelines and Gas Association (APGA) at joint EPRG/APGA/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.

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

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 System (NTS) and Local Transmission System (LTS).

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 transportation 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

TRL3 Proof of Concept

Technology Readiness at End

TRL5 Pilot Scale

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

NGGT contribution: £48,600
Cadent Gas contribution: £41,727

Total = £90,327

Additionally, and like the membership in 2019, each UK party member is required to contribute £5k/yr towards the total cost of the Joint Technical Meeting (JTM) event as part of membership (forecast as £5k contingency). This is a key dissemination activity for the affiliation, which can be shared to the wider UK network licenses, thereby supporting the NIA criteria of shared learning.

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.

From the last minutes of each committee, they had the following projects:

Corrosion:

- Effects of Cathodic Protection on Coating Damage
- Effects of Cathodic Protection on the Mechanism of Near Neutral SCC
- Evaluation of available aboveground "intensive Methods" and ongoing developments
- Remote monitoring of Cathodic Protection System: Recommendations and limits

Materials:

- Mobile Optical Emission Spectroscopy
- Benchmark of full and small scale reeling methods
- Development criterion brittle crack propagation resistance in Low OD/ Thick WT pipe
- NDT benchmark for HFI pipe
- Ductile Fracture in modern steels
- Pipe marking and tracking
- Literature study: predicting fracture behaviour of modern steel pipe
- Tensile Test: Influence of specimen

Design:

- Unpiggable Pipelines – Results of EPRG Survey of Operators and Inspection Vendors
- Advancement of Dent-Gouge damage assessment methodology
- Code Breaks in the Design of Pipeline Components
- Hydrogen transport pipelines: literature study of design/material challenges and mitigations
- Simplification of the determination of the ductile tearing resistance curve (J-R curve)

Please provide a calculation of the expected benefits the Solution

Research therefore N/A

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

Knowledge from participation in the various international innovation programmes is applicable across the gas transmission and distribution network, 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 the EPRG project portfolio is to avoid unnecessary international project duplication and therefore National Grid and Cadent Gas are confident that these programmes do not compromise the NIA duplication requirement.

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 believe 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

By definition the research nature of the work carried out through EPRG would mean that it would be very difficult to put together a robust business case to seek internal funding. There is no guarantee that the outputs will be success for the research topics.

This project has been approved by a senior member of staff

☑ Yes