

## NIA Project Registration and PEA Document

### Date of Submission

Jul 2018

### Project Reference Number

NIA\_NGGT0132

## Project Registration

### Project Title

PRCI (Pipeline Research Council International) 2018

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NIA\_NGGT0132

### Project Licensee(s)

National Gas Transmission PLC

### Project Start

April 2018

### Project Duration

1 year and 1 month

### Nominated Project Contact(s)

Gareth Hocking and Quentin Mabbutt (NGGT), Luke Hollis (Cadent Gas)

### Project Budget

£354,000.00

## Summary

National Grid wants to establish best practice technologies and techniques to allow safe, reliable, efficient and economic use of the gas network with a reducing impact on the environment. By participating in PRCI, National Grid has 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.

### Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

## Problem Being Solved

The Pipeline Research Council International (PRCI) is the basis of much of the international research for gas pipelines and above ground installations, providing knowledge to members effectively and economically. PRCI aims to conduct a collaboratively-funded research & development programme that enables energy pipeline companies around the world to provide safe, reliable, environmentally compatible, cost-efficient service to meet customer energy requirements.

## Method(s)

PRCI facilitates a collaborative R&D programme, funded by contributions based on the total length of pipelines operated by each member company. Each member company contributes to the projects that most closely address their needs, but all member companies have access to the output of the complete PRCI programme.

Projects are balloted annually and members participate in projects that most closely meet their individual network needs. National Grid and Cadent completed a review of the projects on the 2018 ballot and committed contributions to eight projects. The review process

involves:

- Assessment of the full ballot list to identify relevant projects for the licensee.
- Discussion with the relevant technical specialists to evaluate potential project value and benefits.
- Identification of National Grid and/or Cadent team member for each project.
- Participation in the annual voting process. PRCI projects go through three rounds of voting to determine which projects will be taken forward.

The projects that National Grid and Cadent are participating in for the 2018 programme offer leverage of 20:1 and broadly these fall into four key areas:

- Design, Materials and Construction
- Integrity and Inspection
- Corrosion
- Surveillance, Operations and Monitoring (SOM)

The National Grid and Cadent funded programmes in the following areas in the 2017 ballot:

- Technology Development Centre (TDC): Provided a base level funding for the maintenance of the TDC which provides the PRCI membership with a comprehensive specimen library as well as unique pipeline testing facilities.
- Design Materials & Construction: Funded programmes to evaluate the latest pipeline in-line isolation technologies, the evaluation of use composite repairs of pipelines which have dent and gouge defects and the full scale testing of pipeline sections under the influence of high loads due to vibration and temporary loadings due to operational requirements/
- Integrity and Inspection Surveillance: Funded the use of aerial LiDAR data collection for Geohazard assessment and the assessment of satellites to monitor and improve pipeline river crossing management.
- Operations and Measurement: Funded programmes examining the fitness for service of crack within corrosion defects and the development of a holistic standard for the definition of the impact of stay DC interference on transmission pipelines.

In 2017, the PRCI introduced the Research Bank, which allowed members to allocate funds to the bank which could be used throughout the year to fund new initiatives. Currently, National Grid is looking to use its Bank fund to support work on novel methane pipeline detection systems.

All the areas of project support were chosen to align with the current innovation portfolios and are key business areas of interest.

## Scope

Participation in PRCI gives National Grid Gas and Cadent Gas access to 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 want to establish best practice technologies and techniques to allow safe, reliable, efficient and economic use of the gas networks with a reducing impact on the environment. By participating in PRCI, National Grid and Cadent have 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 assess the collaboration through individual projects against the ability to develop improvements to how we build, manage and operate the networks. Success is also determined by the level of influence we exert on each research programme and the financial leverage available compared to self funding the research.

## Project Partners and External Funding

PRCI facilitates a collaborative R&D programme, funded by contributions, based on the total length of pipelines operated by each member company. Total annual budget from all member companies is over \$10 million/year.

## Potential for New Learning

Collaboration through international research programmes, through industry bodies, is essential to ensure we benefit from leveraged research. The programmes allow us to develop new learning for specific challenges we face, 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.

## Scale of Project

The projects are hugely varied in scale, ranging from full scale trials at a purpose built Technology Development Centre (TDC) facilities to purely desk based studies.

## 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 the world.

## Revenue Allowed for the RIIO Settlement

None

## Indicative Total NIA Project Expenditure

£353,600 – Annual NIA spend  
£175,200 – NGGT NIA Spend  
£178,400 – Cadent NIA Spend

## 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)

For the PRCI, formal cost/benefit studies of member participation show a consistently positive ratio for the reduced costs of operations and maintenance, inspection, materials, design, construction and testing. For example:

In 2017, National Grid played a key role in the work looking at the 'State of the Art of Alternative Pipeline Materials- PR-473-144506'. This work culminated in a number of clear recommendations which will be studied and, where appropriate, incorporated in the relevant NG standards. This information has ensured that NNGT's programme has been tailored to incorporate the learning from the previous work reducing duplication of analysis and has clear cost benefits for new small scale connections (customers) to the National Transmission System (NTS).

In the case of PRCI, National Grid and Cadent can use its subscription fee to support its choice of projects, but additionally, National Grid and Cadent have full access to the results of all other projects that they do not specifically support.

#### 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.

This could range from minimal incidental implementation costs to approximately £100,000 but is very dependent on the specific project details. In some cases, results may be used to update policy, standards and specifications in order to reflect best practice. In other instances further work may be triggered to fully assess the implications for the GB networks. Alternatively, results may simply improve the general knowledge base and avoid unnecessary future expenditure.

### 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 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 PRCI project portfolio is to avoid unnecessary international project duplication and therefore National Grid and Cadent 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 PRCI is an international collaboration of gas transmission companies that undertakes research of common interest and benefit to the membership. Member companies and the PRCI committees consider and review proposals from all members for new projects and interact regularly with other relevant institutions such as the EPRG and national research groups of the member countries, ensuring that duplication of previous work is avoided.

### **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 the development of effective implementations into business as usual by the network licensees. Due to these risks associated with the wide ranging nature of the PRCI's research activities are mitigated by the consortium approach and is thus considered a natural fit with the NIA funding objectives.

### **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**

Further PRCI participation also provides high leverage for the NIA contribution. Currently the NIA contribution by the both Cadent Gas and NGGT is ~1.25 % of the total PRCI annual funding from members. This gives a leverage of 43:1 on programmes directly supported but membership also affords access to the comprehensive library of documents and past research. 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 direction and output of key projects. 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 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.

### **This project has been approved by a senior member of staff**

Yes