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NIA Project Registration and PEA Document

Date of Submission

Feb 2018

Project Reference Number

NIA_CAD0017

Project Registration

Project Title

End Load Restrain Capability

Project Reference Number

NIA_CAD0017

Project Licensee(s)

Cadent

Project Start

February 2018

Project Duration

3 years and 1 month

Nominated Project Contact(s)

Cadent Innovation Team

Project Budget

£170,581.00

Summary

Cadent are seeking to undertake a testing program to work to confirm the performance claims made by Viking Johnson (VJ) and George Fischer (GF) that their range of "Ultra-Grip" (VJ) and "Multi-Joint" (GF) products can operate without the requirement for external restraints, such as anchor blocks, when subjected to end loadings induced by network operating pressures and soil loading conditions

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

Thrust forces occur at the location of changes in direction, reductions in diameter (bends, tees, tapered sections) and at the end of pipelines carrying pressurized fluid. These forces may lead to joint separation on the pipeline unless they are counteracted by using concrete anchor blocks or self-anchoring devices.

Currently Cadent uses traditional techniques for anchoring which involves the creation of concrete anchor blocks which have many drawbacks including their weight and size. Among those are also:

- Space on work sites. This can lead to real problems as the limited space available under ground has to be shared many networks (such as gas, sewage, telecommunications and cable networks).
- Trench opening time. Good concreting practices require a maturing time of 2 days/48 hours before applying a load. Even if this time can be shortened, it constitutes a major constraint that is no longer acceptable in urban areas.
- Long-term risks of destabilization. These risks may be due to natural causes, such as non-homogeneous soils or irregular ground, nearby digging for work on other networks, especially in urban areas. These factors affect the stability and, therefore, the durability of concrete structures and raise the fear of possible junction separations.
- A heritage that is hard to manage. Major dismantling works have to be carried out when modifications or servicing are required on a pipeline or, later on, when a pipe has to be removed at the end of its life.

Method(s)

Cadent are seeking to undertake a testing program to work to confirm the performance claims made by Viking Johnson (VJ) and

George Fischer (GF) that their range of “Ultra-Grip” (VJ) and “Multi-Joint” (GF) products can operate without the requirement for external restraints, such as anchor blocks, when subjected to end loadings induced by network operating pressures and soil loading conditions

Scope

Scope of testing reduced to only look at Viking Johnson fittings due to suitability of George Fischer size range.

Objective(s)

- Assess the self-anchoring performance of the Viking Johnson “Ultra-Grip” and George Fisher “Multi-Joint” products using technical guidance from relevant industry codes and standards and provide a recommendation on the suitability of the clamp for field trials.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- Published a report confirming the performance requirements of a fitting to enable its use without the requirement for anchoring fixtures.

Project Partners and External Funding

Cadent and Rosen.

The project will be wholly funded by the NIA.

- External (Rosen) - £119,014
- Internal Allowance - £39,666.53
- Contingency - £11,901.4

Total: £170,581

Potential for New Learning

The utilization of self-anchoring solutions could speed up ppipe laying and site acceptance

Scale of Project

The scale of the project is across all Cadent Networks where End cap load restrains system is required. This work will inform all Gas Distribution Networks that have similar issues with anchoring fixture in their networks. The scale of investment in this project is necessary due to the current lack of self-anchoring fittings which have caused 2 major safety incidents in the last 6 years.

Technology Readiness at Start

TRL5 Pilot Scale

Technology Readiness at End

TRL5 Pilot Scale

Geographical Area

The project will be delivered from Rosen facilities in Newcastle and the Cadent offices in Hinckley.

Revenue Allowed for the RIIO Settlement

No revenue allowed for in the RIIO settlement.

Indicative Total NIA Project Expenditure

£170,581.

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 final output of the project will outline the performance evaluation of Viking Johnson ultragrip and George Fisher multi-joint pipe fittings. This project will support Cadent to take the required decisions and recommendations to assess the fittings suitability and ultimately implement the technology into the business.

Please provide a calculation of the expected benefits the Solution

Current cost of anchoring/km of MP main replaced = £12476

New estimated cost of same = £4607

Potential Saving = £7869

These calculations do not consider the implementation and development costs associated with this project.

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

The end load restrain technology will be replicable across all networks

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

Implementation cost will include cost of changing current policy and training documents.

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 project will determine if self-anchoring fittings can be used safely and effectively in the gas industry, which will provide a safer and quicker technique for replacement and repair of pipes in other GDN's 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 supports Cadent Gas' drive to develop more efficient replacement technologies.

- 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.

This project does not lead to unnecessary duplication as it is directly targeting repair techniques for Non Standard Materials within Cadent Networks, and these techniques are not currently available within the gas industry.

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

This Project is Innovative as it involves utilizing a fitting from the water industry crossing over to the gas industry.

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 Network Licensee will not fund this project as business as usual due to its innovative nature of the work, it is possible that these fittings prove unsuitable.

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

This project can only be undertaken with the support of the NIA as it directly looks to innovatively explore and test new and previously unused tools and techniques.

This project has been approved by a senior member of staff

Yes