

NIA Project Registration and PEA Document

Date of Submission

Mar 2020

Project Reference Number

NIA_CAD0049

Project Registration

Project Title

Pipeline Spacers

Project Reference Number

NIA_CAD0049

Project Licensee(s)

Cadent

Project Start

March 2020

Project Duration

2 years and 7 months

Nominated Project Contact(s)

Nick Cannon

Project Budget

£178,200.00

Summary

A conceptual design for a casing spacer (in the form of a wheeled clamp) has been provided by FT Pipeline Systems (FTPS). It is intended that such spacers will be clamped around the PE pipe at an axial spacing of 2 m, during the insertion process.

The spacers will enable the PE pipe to be 'rolled' over the Weko seal brackets during insertion, thus eliminating the need to remove the Weko seals; and the associated requirement for man entry to the cast iron pipe. Potential risks for operatives working inside the buried pipes include ground failure and water flooding from adjacent water mains.

The project will involve the following elements/stages:

1. Design review and loading calculations report

ROSEN will perform an assessment of the proposed spacer design, to ensure that the loads on the PE pipe and spacers themselves are acceptable during the installation and operational life of the PE pipe.

2. Development of G23 documentation

ROSEN will lead the development of the G23 field trial procedure and RAMS for installation, with input where required from Cadent and FTPS. The G23 document will contain the installation procedure required for the use of the spacers for PE pipe insertion.

3. Field Trial report

ROSEN will attend two field trials (pipe pushes) for the insertion of PE mains using the spacers, one with Weko seals to navigate, and one without. It is assumed that these field trials will be maximum 300 m long insertions, with spacers installed at 2 m intervals. 300 pipeline spacers will be provided for this project, which will enable the insertion of 630 mm diameter PE pipe into a 36-inch diameter cast iron main. A Report detailing the outcomes of the field trials, and feedback of operatives following use of the wheeled clamps will be produced following the end of the Field Trials.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

The process of insertion of large diameter PE pipe (500 mm and above) inside cast iron pipelines (24" and above) currently requires

an operative to enter the pipe to remove any Weko seals from joints before the PE pipe can be inserted.

Method(s)

A conceptual design for a casing spacer (in the form of a wheeled clamp) has been provided by FT Pipeline Systems (FTPS). It is intended that such spacers will be clamped around the PE pipe at an axial spacing of 2 m, during the insertion process.

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Scope

The proposed scope of work is to provide:

- A review of the spacer design to ensure it is appropriate for long term use
- Review of the materials used in the FTPS pipeline spacer to ensure they will not have a detrimental effect on the PE pipe
- Perform loading calculations to confirm that the axial spacer separation distances will not result in unacceptable loading on the installed PE pipe
- Development of G23 field trial procedure and RAMS for installation.
- Carry out two field trials for insertion of PE mains using spacers, one with Weko seals to navigate and one without.

Objective(s)

The objective of this project is to eliminate the removal of Weko seals by using Pipeline Spacers. The spacers will enable the PE pipe to be 'rolled' over the Weko seal brackets during insertion.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Success Criteria for this project:

Approved design of spacers, ensuring it is appropriate for long term use on PE pipe.

Loading calculations which will prove that the axial spacer separation distances will not result in unacceptable loading on the installed PE pipe.

2 Field Trials on 36-inch diameter cast iron mains, successfully undertaken on 36-inch diameter cast iron pipe. These will look to prove that the spacers are suitable to be accepted on the Gas Network

Project Partners and External Funding

This project will be wholly NIA funded

Cadent

Rosen UK Limited – Nil external funding

Potential for New Learning

Should any issues and findings during the field trials be established, then recommendations will be provided for amendments to the installation procedure and any further development of the product.

Scale of Project

The Field Trials will take place in the London network, as this network has the majority of Weko Seals installed. By the trials taking place in London, it gives greater opportunity to trial a good number of spacers which will look to prove or not the suitability of the product.

If smaller trial sites were used, to establish the same suitability, more sites would be needed. This would have a potential impact upon customer disruption, as well as extra costs. There could also be a risk that the smaller sites would not encapsulate the required elements for testing of the spacers e.g. suitability, maximum push length, how many metres could be covered in one day.

Technology Readiness at Start

TRL6 Large Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

Rosen will conduct the design review of the spacers at their own facilities in Newcastle. However, Rosen will attend 2 Field Trials sites based in Cadent’s London Network, working closely with Cadent Operations and partners.

Revenue Allowed for the RIIO Settlement

No revenue has been allowed for within the RIIO Settlement.

Indicative Total NIA Project Expenditure

- External - £132,000
- Internal - £33,000
- Contingency - £13,200
- Total NIA funding - £178,200

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)

Benefit – potential to save circa £130k per annum or £41.00 per metre, based on current planned jobs.

Please provide a calculation of the expected benefits the Solution

Cadent assumptions:

- Excavations every 500m instead of every 400m as today.
- Be able to push 150m per day instead of 60m as today.
- No need for specialized Weko seal removal team

Base costs to remove 838m of Weko Seals - £189k or £170.00 per metre

Method costs for same job - £107,700 or £129 per metre

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

Assuming the other GDNs have a need for similar usage, this method could be rolled out equally in all GDNs.

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

There are no estimated costs for rolling out this solution as no maintenance will be involved and no specific training is required.

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

The project will develop and trial a pipeline spacer which will look to eliminate the need to remove Weko seals. Should this prove to be successful, then this solution could be adopted and implemented by all GDNs where Weko seals are an issue.

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

n/a

- ☒ 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

This project is innovative as the solution is not currently in use within the Gas Network.

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

With the end result unsure, due to this project being innovative, and the product not yet proven within the Gas Network, Cadent would not consider this part of business as usual, as a process is already in place for this activity.

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

Due to the project requiring research and development as well as not yet existing in the Gas Network, then NIA funding is appropriate to help move this forward. This project will look to remove the operational risks associated with operatives entering the cast iron pipes.

This project has been approved by a senior member of staff

☒ Yes