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

Feb 2018

Project Reference Number

NIA_CAD0018

Project Registration

Project Title

Assessment and Creation of Novel PE Pipe Repair Systems

Project Reference Number

NIA_CAD0018

Project Licensee(s)

Cadent

Project Start

February 2018

Project Duration

2 years and 4 months

Nominated Project Contact(s)

Cadent Innovation Team, SGN lead – Alex Stewart

Project Budget

£313,672.00

Summary

Task 1 – Initial acceptance testing:
For each of the repair techniques, it will be necessary to identify any potential benefits the technique can offer over conventional systems,
to assess any potential limitations of use in terms of site application and conditions, repair geometry and pressure containment capability,
and to identify any perceived gaps.
Task 2 – Initial field trials of potential PE pipe repair systems:
A series of field trials of the most promising systems identified. The first part of Task 2 will be to develop the appropriate G23 (field trial
procedure) to enable use of the various repair systems on the low pressure gas distribution network. There will also be a need to select a
number of field trial sites. It is suggested that 4 techniques should be selected to cover the variety of potential systems currently available
(5 applications of each of the 4 technique types). The installed repairs will be monitored over a period of time, initially 3-6 months is suggested.
Task 3 – Creation of training material:
Rosen will develop and provide more operational guidance within Gas Distribution Networks. Rosen will develop initial briefing material,
probably in the form of an engineering bulletin, to inform network Operations Staff of the potential for use of these techniques. A briefing
document will be developed and circulated to potential repair system providers by Rosen. Rosen will also provide an initial outline draft of
procedures for the new repair methods. Rosen will provide support for the Gas Distribution Network's in gaining industry wide approval for
the finalised technical specification for methods of repairing leaking PE systems.

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

Cadent currently attend to thousands of leaks annually on PE mains and services. Of the 5901 repairs across all pipe types in interference damage alone, 5384 repairs were on PE pipe in 16/17. The bulk of these repairs were on LP services (4412). Currently there is only one permanent repair technique available which is cut-out and replace. The introduction of alternative techniques will improve the current procedures and reduce the time invested in the repairs.
The use of interim or permanent live application repair techniques could offer significant cost savings over the current process of an intermediate temporary repair followed by D1 checks and a planned cut-out and replace.
Furthermore, conducting a live permanent repair will also mitigate the need for big excavations to bypass and replace pipes which prevents loss of supply for our customers. Smaller excavations will also reduce reinstatement costs and lead to less traffic disruption.

Method(s)

Task 1 – Initial acceptance testing:
For each of the repair techniques, it will be necessary to identify any potential benefits the technique can offer over conventional systems, to assess any potential limitations of use in terms of site application and conditions, repair geometry and pressure containment capability, and to identify any perceived gaps.

Task 2 – Initial field trials of potential PE pipe repair systems: A series of field trials of the most promising systems identified. The first part of Task 2 will be to develop the appropriate G23 (field trial procedure) to enable use of the various repair systems on the low pressure gas distribution network. There will also be a need to select a number of field trial sites. It is suggested that 4 techniques should be selected to cover the variety of potential systems currently available (5 applications of each of the 4 technique types). The installed repairs will be monitored over a period of time, initially 3-6 months is suggested.

Task 3 – Creation of training material:
Rosen will develop and provide more operational guidance within Gas Distribution Networks. Rosen will develop initial briefing material, probably in the form of an engineering bulletin, to inform network Operations Staff of the potential for use of these techniques. A briefing document will be developed and circulated to potential repair system providers by Rosen. Rosen will also provide an initial outline draft of procedures for the new repair methods. Rosen will provide support for the Gas Distribution Network's in gaining industry wide approval for the finalised technical specification for methods of repairing leaking PE systems.

Scope

The proposed scope of work falls into 3 Tasks:
Task 1: Acceptance Testing – to identify and assess suitable PE repair techniques.
Task 2: Initial Field Trials – Location of field trials TBC but will be split accordingly between Cadent and SGN Networks.
Task 3: Creation of Training Material – Creation of training material and draft procedures for the new repair techniques.

Objective(s)

To develop, approve and deliver potential permanent PE pipe repair systems for use within the GDN's – this Project focuses on the initial acceptance testing and field use of several of these repair systems.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Creation of a suite of PE repair techniques enabling first time, live permanent repairs.

Project Partners and External Funding

Total Project Costing is	£313,672
Total SGN	£79,763
Total Cadent	£233,909
External costs	£159,524
Contingency @ 10%	£15,952
Internal costs @ 33.3%	£58,433
Total Cadent	£233,909

Potential for New Learning

New potential PE pipe repair systems could be shared amongst GDN's and therefore promote a new, more efficient way of dealing with leaks on the PE network.

Scale of Project

The testing and creation of PE Repair techniques that can be shared across all Gas Distribution Networks to maximize the benefits.

Technology Readiness at Start

Technology Readiness at End

TRL2 Invention and Research	TRL8 Active Commissioning

Geographical Area

Trials sites TBC but will be split accordingly across SGN and Cadent networks. Potential project output would have an impact on all relevant network licencees.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£313,672

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 tools and techniques developed during this project have the potential to offer great financial savings when compared to the current process of temporary repair followed by cut out and replace, these financial savings will be seen in a reduction in labour time, a reduction in reinstatement costs due to small excavations and a reduction in customer disruption due to live repair techniques being developed.

Please provide a calculation of the expected benefits the Solution

In the current state Cadent repairs PE based on a cut out technique which costs £608,256 annually. It is anticipated that the new PE repair techniques will reduce this cost by 25% annually. This cost reduction is based on the assumption that a permanent PE repairs will mitigate the need for big excavations to bypass and replace pipes which will prevent loss of supply for our customers. Smaller and shallower excavations will also reduce reinstatement costs and lead to less traffic disruption. The business case will be validated through the final solutions and field trials.

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

The repair methods will be replicable across all networks which contain a PE assets population, this population is currently increasing and is expected to replace the majority of the network during the GD2.

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

Roll out cost will include training costs, cost of change to documents and policy, sustained embedding of techniques within Operations. It is expected that the cost of rolling out the method across all networks will initially be greater, due to new techniques and equipment, however once implemented across the networks these costs will be off set by the financial savings delivered by the project.

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

New PE repair techniques can be shared amongst all GDNs in order to aid all GDNs to better respond to leakage from PE pipes.

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.

This project does not lead to unnecessary duplication as it is directly targeting repair techniques for PE 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 (not business as usual) due to the exploration of new tools and techniques for dealing with repairs from PE materials within the networks.

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 exploration of new techniques for dealing with repairs from PE materials.

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 for PE repair. The project directly targets specific operational risks linked to PE repairs, which currently in business as usual we cannot target. The project will also benefit all relevant network licensees that have PE population in their networks, and through the NIA learning will be shared amongst these licensees.

This project has been approved by a senior member of staff

☑ Yes