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

Sep 2013

Project Reference Number

NIA_NGN_024

Project Registration

Project Title

Combined Accurate Detection with Minimal Excavation

Project Reference Number

NIA_NGN_024

Project Licensee(s)

Northern Gas Networks

Project Start

August 2013

Project Duration

0 years and 5 months

Nominated Project Contact(s)

Ian Whithead, Greame Cleeton and Alec Breen

Project Budget

£125,000.00

Summary

Detecting leakage where no immediate obvious solution is available, typically city centre locations, congested highways or locations with particular specific engineering difficulty, repairs can be expensive to undertake requiring significant resources, disruption to customers and can take a long time to resolve. Currently repair team spend significant excavation leakage detection holes provided by normal detection methods. NGN wish to test and develop a new approach to leakage detection by combining new leakage detection technologies with road coring and vacuum excavation techniques.

Vacuum Excavation and road coring have not gained GB wide HAUC approval and therefore NGN have no current remit to use this technology within its region footprint.

Third Party Collaborators

UPSCO Europe Limited

Steve Dunmore

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

Detecting leakage where no immediate obvious solution is available, typically city centre locations, congested highways or locations with particular specific engineering difficulty, repairs can be expensive to undertake requiring significant resources, disruption to customers and can take a long time to resolve. Currently repair team spend significant excavation leakage detection holes provided by normal detection methods. NGN wish to test and develop a new approach to leakage detection by combining new leakage detection technologies with road coring and vacuum excavation techniques.

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Method(s)

Combining project Visual & Acoustic Leakage Detection NIA_NGN_042 with this project to test a completely new approach to leakage management. To engage with a specialist contractor to demonstrate and prove if the combination of techniques has a greater potential to reduce disruption to the public, significantly increase location methods and reduce damage to the highway. Engage a specialist engineering consultant to assist NGN to improve processes around location and above ground tooling to facilitate new repair techniques. Engage with all northern local authorities on the approval of the combined activities to reduce leakage location times and allow coring to be an acceptable reinstatement technique

Scope

Coring technology is not new to the gas industry as a method of exposing leaking gas mains. However, it has not been fully proven across all repair techniques, location of leakage still remains a significant element of the whole process which limits some deployment. Combining location technologies, investing the theory that specialist leakage location teams, rather than expensive repair teams, can increase our ability to quickly and accurately locate leakage.

NGN wish to develop a whole new collaborative approach to this problem by combining external specialist skills under a new contract to develop and supply specialist skills and equipment. This new approach will bring new processes, techniques and tooling in the leakage location and repair arena.

Combined Accurate Detection with Minimal Excavation will increase the benefits of the work NGN is doing with the acoustic location technology with the ability to pinpoint leakage problem providing a planning type ability to repairs rather than a reactive methodology.

The aim of the project:

- To assess if combining accurate leakage location with new coring technologies can reduce time spent pinpointing network failures
- To assess if using specialist location skills deployed on difficult to locate leaks can allow repair teams to focus on emergency customer critical repairs
- To demonstrate to local authorities in the North East & Yorkshire the suitability of coring repair activities to reduce impact on highway integrity
- To develop other tooling and repair techniques that increases our ability to complete all repairs first time.

This approach is innovative within the gas industry as it is purely focused on increasing leakage location, pinpointing problems and minimising disruption. As part of the project NGN will deploy innovative tooling and techniques that will increase the networks ability to deal with pinpointed repairs instantly.

Objective(s)

To confirm the combined approach is achievable in reducing the time spent on pinpointing leakage then exposing points of interest immediately to deal with the network failure.

To establish a full cost benefit analysis of the combined techniques of Acoustic Measurement and Coring Repairs. To establish the safety procedures required for deploying these technique and what controls are required to ensure increased safety is maintained

To assess the processes, people skills and training required to deploy this equipment, with recommendations for full deployment:

- Measure - Reduction in reinstatement requirement
- Measure the impact on NRSWA
- Measure the impact on Customer – especially around traffic disruption.

Produce a detailed summary report for each job detailing findings, results and outcomes.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

To deploy coring repairs immediately following acoustic interest to identify exact nature of network failure Obtain full approval from North East & Yorkshire Authorities to allow coring of highways Increase NGN's ability to repair failures over and above lead yarn joint failures Reduce the impact of location excavations and repairs holes on the highway integrity To confirm the commercial viability of the combined technique and the approach of focusing specialist skills on leakage location.

For the project to be a success it is necessary to win the ‘hearts and minds’ of the teams, trade unions, team managers and highway authorities. They all have to embrace the change and, for the teams, not to reach for the jackhammer

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project has been designed to minimise the trial duration by sharing skills and knowledge developed in Scotia Gas and then to deploy specialist skills under this new approach. It will work alongside project NIA_NGN_042 to develop this combined approach. It will require input from around 2FTE's from NGN to support specialists in developing new processes and deploying new tools and equipment.

Sharing with SGN working practices and hire their equipment plus team to learn initial approach. Engaging specialist owner operator of coring equipment to undertake development trial Engaging with specialist engineer to develop processes and liaise with local authorities

Technology Readiness at Start

TRL7 Inactive Commissioning

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

This project will focus initially in the West Yorkshire area but will increase the deployment as the project develop to a wider scale this will depend on the number and viability of the new process.

Revenue Allowed for the RIIO Settlement

This project is focused on making planned decisions on difficult to locate escapes, placing these into a planning process developing a consistent approach. Potential benefits and cost saving may be realised on future reducing time from identifying "difficult to locate" activities to completing first time repair. This should reduce operational expenditure on Networks repair activities.

Indicative Total NIA Project Expenditure

The project expects to fund 90% of the project costs from NGN's NIA allowance. The total expenditure is expected to be £100k external costs and £25k NGN internal costs.

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 focus of this project is minimising the time utilities spend in the highway locating leakages, rather than actually undertaking the repair. Location excavations can take up to 40% of gas repair excavations these provide little benefit to the customer but are currently required to provide pinpointing the escape point. By using techniques like NGN's acoustic location and combining this with coring technologies these location excavations could be reduce to below 12%

Please provide a calculation of the expected benefits the Solution

Estimated current location hole cost = £500. Core location alongside accurate estimated £75.

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

It is envisaged that the cost benefits of this trial could provide seven excavations per week at the reduced rate. If deployed fully across the whole of NGN the benefits could raise to 20 excavations per week, resulting in a minimum saving of 20 * £425 = £85k per week. This could provide benefits of around £400k per year.

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

Across all GDN's this could provide customer benefits of £3.2m

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 approach is that other GDN's will learn from a new approach on dealing with difficult to locate escapes and combining different technologies into a single process can free up more urgent customers issues. We will work with other GDN's to share learning from this project and combine this with similar ongoing projects to improve strategic approaches to leakage location.

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

Within the RIIO Business Plan:

- Innovation Section
- Project 25
- Innovative Excavation & Reinstatement Technologies

Introduction of existing / new technologies and techniques, that reduce our time within the highway. It will also focus on maximising the use of recycled material. This will include new plant location equipment, technologies that help assist pointing escapes and maximise the use of non-intrusive repairs.

☑ 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

n/a

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

n/a

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

n/a

This project has been approved by a senior member of staff

☑ Yes