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

Jan 2017

Project Reference Number

NIA_NGGD0091

Project Registration

Project Title

Safe Digging Phased Array Feasibility Study

Project Reference Number

NIA_NGGD0091

Project Licensee(s)

Cadent

Project Start

January 2017

Project Duration

0 years and 11 months

Nominated Project Contact(s)

NGGD – Sharon Harrison

Project Budget

£86,753.00

Summary

The project will include:

- Requirements capture
- Electromagnetic modelling
- The building of a Laboratory model and testing
- a summary report on findings and next steps

Nominated Contact Email Address(es)

Innovation@cadentgas.com

Problem Being Solved

There is a significant risk of fatal or severe injury as a result of a cable strike when excavating in the highway. This is a major hazard for all utilities and specifically Gas Distribution Networks due to the frequency in which there is a requirement to access pipes in a built up environment.

A critical step in the safe system of work for excavating in the highway is the detecting, identifying and marking of services. A key part of this is the utilisation of an avoidance tool by a competent person. This is a mandatory requirement in NGGD procedure and HSG47 (third edition).

The existing services present in the ground may contain live power cables that have been capped off (called stubs/pot ends), cables may be live but not transmitting a magnetic signal or may be so well balanced that they cannot be detected by existing tools. Therefore, there is a need to develop a technology that is capable of detecting such cables with a high level of accuracy.

Method(s)

A feasibility study will be undertaken that will:

• investigate a detector methodology based on a phased array Electromagnetic sensor configuration

• investigate a detector based on pulsed Electromagnetic sensor

Consisting of two aspects:

• Modelling potential arrangements and selecting the most suitable for building a laboratory test version, and;

• Create the laboratory test setup

Scope

The project will include:

- Requirements capture
- Electromagnetic modelling
- The building of a Laboratory model and testing
- a summary report on findings and next steps

Objective(s)

To prove that electromagnetic phased array technology could be utilised to detect cables with a low magnetic signal, to enable progression to a further development phase.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Documented tests conducted in a replicated field environment proving that the technology can detect and quantify the type of cable buried.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

Laboratory and replicated field environment tests will be conducted at TTP premises

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

TTP premises - Cambridge

Revenue Allowed for the RIIO Settlement

Not applicable, this is a safety driven project

Indicative Total NIA Project Expenditure

NGGD Total NIA expenditure £86,753

Total external expenditure £59,150

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 project is at feasibility stage, therefore a full financial benefits summary is not required.

Potentially savings will be achieved through reduction in injury rates, and reduced volume of excavation if more accurate location of services is possible.

Please provide a calculation of the expected benefits the Solution

Not applicable as a research project

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

Not applicable

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

Not applicable

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

A piece of equipment that can detect pot end cables could be utilised by all GDNs

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 is driven by the need to give continuous improvement in safety specifically cable strike avoidance.

☑ 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