

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 2016

### Project Reference Number

NIA\_NGGD0084

## Project Registration

### Project Title

Remote monitoring Device for Flammable and Toxic Gases

### Project Reference Number

NIA\_NGGD0084

### Project Licensee(s)

Cadent

### Project Start

September 2016

### Project Duration

0 years and 8 months

### Nominated Project Contact(s)

NGGD: Joe McShane – Innovation Project Manager  
NGGD: Andy Newton – Innovation Portfolio Manager  
NGGD: Ian Aldridge – Head of Transformation Engineering  
Policy NGGD: Ali Hamdani – Strategy Engineer – MOBs  
Smart Compliance – Scott Wallace, Managing Director

### Project Budget

£24,750.00

## Summary

The Scope of this proposal is to design, manufacture (rapid prototype) and trial the detectors in gas riser systems specific to MOBs.

The outputs of the project will be a developed, tested and trialed prototype which will be assessed at the end of the project via a Project End Stage Assessment. At this time, a decision will be made to progress the project to the next stage (detailed design, manufacture and further field trials).

### Nominated Contact Email Address(es)

Innovation@cadentgas.com

## Problem Being Solved

As part of National Grid Gas Distribution (NGGDs) replacement programme, innovations need to be investigated which could mitigate inherent issues associated with Multi-occupancy Buildings (MOBs). At present, all riser pipe assets are risk-assessed and then either remediated or replaced based on their risk score. In certain instances, it may be difficult to assess the asset due access constraints e.g. (spatially restricted area).

The risk model used adopts a risk-averse approach which results in many instances, leads to the being replaced and re-re-routed as per current industry requirements.

The result of these replacement works can be expensive, invasive and disruptive to the customer – by developing a means of pro-actively monitoring gas escapes in restrictive areas could provide adequate mitigation and 'de-risk' the asset, which would negate the need to execute replacement works.

## Method(s)

It is proposed to develop a new gas detection device that has the ability to communicate natural gas and/or Carbon Monoxide (CO) readings via SMS to a central location (web-based portal); this will enable decisions to be made quickly should the reading rise beyond a specified level.

The scope of the project has been reduced to develop 20 rapid prototype units and complete a month long trial. Further development could then be pursued if the trial is successful.

## Scope

The Scope of this proposal is to design, manufacture (rapid prototype) and trial the detectors in gas riser systems specific to MOBs.

The outputs of the project will be a developed, tested and trialled prototype which will be assessed at the end of the project via a Project End Stage Assessment. At this time, a decision will be made to progress the project to the next stage (detailed design, manufacture and further field trials).

## Objective(s)

The project seeks to prove that this concept is able, through trialling, to demonstrate that offers a viable, cost effective means of monitoring potential gas escapes from assets. Success of the project may lead to further development to a deployable and certified system which could be used on the Network and potentially mitigate the need to replace riser assets located in spatially restrictive areas.

## Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

## Success Criteria

The Project can be considered a success if, upon completion of work:

The product has demonstrated capability of performing the desired task via successful field trials

## Project Partners and External Funding

n/a

## Potential for New Learning

n/a

## Scale of Project

Different representative test sites, approved by NGGD, will be replicated for the purposes of demonstration the efficacy of the rapid prototype.

## Technology Readiness at Start

TRL3 Proof of Concept

## Technology Readiness at End

TRL7 Inactive Commissioning

## Geographical Area

Field trials will be undertaken at NGGD approved locations to provide a representative sample of field variations across the pipe ranges.

## Revenue Allowed for the RIIO Settlement

During RIIO-GD1 it is estimated that NGGD will need to replace 5% / annum of their High rise building services stock and attend 67,500 gas escapes per annum that are attributed to Gas mains, spending approximately £67.5m on repairs.

## Indicative Total NIA Project Expenditure

The total recoverable allowance will be 90% of the project costs shown below for each Licensee under the Network Innovation Allowance (NIA):

NGGD:

External expenditure - £22,250

External contingency @ 10% - £2,250

Internal expenditure - £7409.25

Total NGGD expenditure - £31,909.25.

## 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)

A fully-developed and deployed system will have the potential to 'de-risk' riser assets, effectively reducing replacement costs, time-off gas and improving Health and Safety by providing a pro-active means of monitoring.

#### Please provide a calculation of the expected benefits the Solution

Based on 14/15 RRP figures, NG spent circa 14M replacing riser assets. Via a change of strategy which seeks to repair pipes as opposed to full replacement this figure is reducing and development of this innovation is seen as a means to further negate the need to replace pipework. If the project progresses beyond this stage, the total investment will be circa £200k which would provide a fully developed and certified system which could be deployed on the network. At this stage, the scale of any deployment is foreseen as limited to problematic areas where assets have been historically installed in spatially constrained areas.

The envisaged unit costs for the system are circa £300 plus £26 per annum running costs. Operational costs to integrate the web-based system perceived as low but would need to be supported via staff costs and appropriate business processes.

Full replacement costs for medium-rise buildings are up to £<50k so it can be seen that based on the volume of riser systems NGGD operate that the potential savings far exceed the anticipated investment.

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

All Network Licensees have multiple occupancy buildings across the country with gas risers. The Method and outputs will ultimately benefit all GB Network Licensees

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

The costs of roll-out will be determined from the outputs from the trial (assumed that NGGD would enter a Commercial Arrangement with the Supplier and procure and specified volume per annum).

As part of the NIA, NGG would also share the outputs from the trial with other GDNs which would further expand the benefits case

### 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**

n/a

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

All riser pipe assets are risk-assessed and then either remediated or replaced based on their risk score. In certain instances, it may be difficult to assess the asset due access constraints e.g. (spatially restricted area).

The risk model used adopts a risk-averse approach which results in many instances, leads to the being replaced and re-routed as per current industry requirements.

The result of these replacement works can be expensive, invasive and disruptive to the customer – by developing a means of pro-actively monitoring gas escapes in restrictive areas could provide adequate mitigation and 'de-risk' the asset, which would negate the need to execute replacement works.

- 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