

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

May 2017

### Project Reference Number

NIA\_NGN\_153

## Project Registration

### Project Title

Traceability

### Project Reference Number

NIA\_NGN\_153

### Project Licensee(s)

Northern Gas Networks

### Project Start

May 2017

### Project Duration

1 year and 2 months

### Nominated Project Contact(s)

David Dormund (NGN)

### Project Budget

£20,000.00

## Summary

This concept and technology is currently not used for this purpose with NGN or the GDN gas networks. The project team will monitor progress throughout this period and undertake feedback from all interested parties and will collate trial report.

### Nominated Contact Email Address(es)

innovation@northerngas.co.uk

## Problem Being Solved

Networks have encountered a number of incidents whereby products installed onto the network require recalling due to manufacturing or installation issues. The process of identifying products, covered by the recall, and locating those products on the network can take significant resources.

Suppliers of key products do have robust Quality Management Systems (QM's) in place; however GDN's do not currently take advantage of these to manage traceability following receipt and installation of assets. Products such as Emergency Control Valves (ECVs), buried valves and PE pipe fittings are all delivered from the suppliers with individual serial numbers, batch numbers and manufacture dates, line number and operator which, if captured correctly, would allow for relatively straight-forward recall in the event of a batch issue. Such assets can often be installed on the network in large volumes which can exacerbate the issue if they are difficult to locate. As an example the GDN currently install 60,000 Emergency Control Valves to domestic and commercial gas services annually, which is undertaken by approximately 200 engineers.

There is a requirement for key assets to be able to be identified to allow for targeting of replacement or recall to assist quality management.

NGN is experiencing difficulty in recording and capturing details for steel fittings used to construct the >7bar network (bends, tees, flanges etc.).

This information includes

1. Manufacturing and heat treatment records.
2. Despatch and delivery information
3. Installation information
4. Records system update information.

This has resulted in a great deal of extra work and cost in verifying

- Material suitability and fitness for purpose (FFP). (3rd party assistance in demonstrating FFP).
- Lost and misplaced materials (Duplication of orders and increased downtime).
- Difficulty in determining the final installation location of the item(s).
- Record systems are paper based, (Easily lost, misplaced costly to store and manage)

This problem is found throughout the UK gas distribution networks.

## Method(s)

This purpose of the project is to overcome the problem by means of proof of concept trial which will be undertaken to determine how QR coding can be used for metallic pipeline systems to capture, track and record electronically used involving a technology solution to address points 1 to 4 of the problem.

This project will be undertaken on one capital build project with up to 3 manufacturer/suppliers. End to end traceability of these products is currently undertaken manually and stored in hardcopy. This innovative solution will improve reliability of data capture and eliminate the possibility of human error whilst increase efficiency of data capture and storage.

## Scope

This concept and technology is currently not used for this purpose with NGN or the GDN gas networks. The project team will monitor progress throughout this period and undertake feedback from all interested parties and will collate trial report.

## Objective(s)

Stage 1

- Complete workshop with up to 4 potential supplier
- Develop principle agreement on adoption of designed process

Stage 2

- Modify Existing System to meet requirements of suppliers
- Develop technology to meet business requirements
- Develop system integration process
- Design data transfer system
- Develop bespoke system for trial

### Stage 3

- Install developed system to integrate
- AVK App
- 3rd Party Processes/Systems
- NGN – Receive, Store and Retrieve Data
- Test system on purchase made from 3rd Parties

#### Outputs:

- Development of data transfer system that stores information supplied directly from the fittings manufacturer/supplier,
- Allowing NGN to book items into stock locations/sites,
- Creates an inventory management,
- Assigns a unique QR label to the product,
- Uses a bespoke application to scan and add those items to database enabling an upload to current NGN Asset Management System. (SAP and Data books)

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

n/a

### **Success Criteria**

The project will be deemed a success if the following criteria are met:-

- End to end traceability of key high value material.
- Reduced waste through loss of fittings being reduced.
- Reduced likelihood of human error in recording or missing data. Increased likelihood of supply of required certification from manufacturers and suppliers.
- Reduced need to deviate from NGN specifications and detailed design.
- Reduced reliance of 3rd party FFP assessment and Quality Assurance.
- Reduced cost of 3rd party FFP assessment and Quality Assurance.
- Improved data integrity.
- Reduced workload for MP Site managers in collating materials and Deviations.

### **Project Partners and External Funding**

n/a

### **Potential for New Learning**

n/a

### **Scale of Project**

The project will be conducted under controlled conditions (G23) and as a result there will be a limited number of trials.

This approach is designed to prove the technology works in real operational environments and that the work to commercialise (TRL9) is fully understood based on documented evidence.

## Technology Readiness at Start

TRL5 Pilot Scale

## Technology Readiness at End

TRL8 Active Commissioning

## Geographical Area

The technology will be trialled across the NGN network, once developed the technology will have the potential to be used across the UK gas industry.

## Revenue Allowed for the RIIO Settlement

None

## Indicative Total NIA Project Expenditure

NGN External costs £15,000

NGN internal costs £5000

Total project costs: £20,000

## 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)

This is a feasibility study and the practicalities, benefits and operability of the design will be tested as part of the project. However the end to end traceability of key high value material will enable benefits to be delivered relating to reduced waste of materials, reduced human error relating to data capture and improved data integrity. This will also potentially lead to a reduced workload for MP Site managers in collating materials and Deviations.

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

Benefit can be realised through the reduction of current expenditure for the use of contracted in Professional Services for QC and QA inspections at a cost of £70k per annum.

The benefits will be delivered as a result of:

Less reliance on 3rd party FFP assessments to investigate current issues.

Collation of certification for fittings and as built records.

Reduced QC and QA inspection.

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

This is an feasibility study for NGN's network, by using the ratio of 4:2:2:1 for the other networks, any forecasted benefits could be replicated across all GDN's, this will very much depend on the utilization and commercial arrangements that they may currently have with alternative technology.

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

We are unable to provide an more detailed roll out for this technology at this initial submission but are aware that there is a requirement upon networks to have SMART data capture capability for field based network operations teams which, if not already in place would have an investment requirement.

### 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 problem addressed by this project is industry wide and at present no solution is available for metallic pipeline systems relating to end to end traceability during and after construction, and this project will offer technology to all network licensees with the focus being on non-specialist services.

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

To facilitate a robust traceability and installation record for the construction of assets that enables

Expanded focus on safety, reliability and environmental impacts through a robust quality assurance program with electronic data capture and formal metrics recorded relating to the metallic network construction.

- 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