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

Dec 2016

Project Reference Number

NIA_NGN_189

Project Registration

Project Title

Syphon Waste Water Remediation

Project Reference Number

NIA_NGN_189

Project Licensee(s)

Northern Gas Networks

Project Start

February 2017

Project Duration

2 years and 9 months

Nominated Project Contact(s)

John Pickering

Project Budget

£54,173.00

Summary

The Scope of the project is to reduce NGN impact on the environment, by developing a filter (s) to capture impurities from syphon waste, through a filtration system on site so the water can be disposed of in a conventional way.

The project will be split into three stages:-

Stage One – Development.

Develop the polymers to capture all the impurities from syphon waste, this would include sampling syphon waste from all areas within NGN.

Review.

Stage Two Prove concept

Develop a filtration system that can be utilised within our normal removal systems (AT and syphon vehicles).

Test and analyse waste throughout this stage.

Review the disposal of exhausted filtration units.

Look into a system of testing waste for impurities.

Undertake on site trials and analysis.

Review

Stage Three - Implementation

Develop a process

Develop a training plan.

Stage four -

Review future developments.

Undertake a close out report

Third Party Collaborators

Capture Green

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

NGN are always looking for ways to reduce its impact on the environment and one area where we could considerably reduce our special waste, is by capturing the impurities from syphon waste, through filtration. This process would completely change the way we capture this waste

Underground gas main pipe line suffer from some ingress of water from potable water main bursts and/or maintenance operations. This water can remain inside the gas main for long periods and therefore be exposed to differing levels of contaminant concentrations, gas operators remove the water by means of a vacuum pump at a stand pipe to syphon the water into a portable ATU vessel. The water removed from the main is considered to be a special waste liquid due to the various contaminants which may include a strong gas odour (methanethiol/mercaptan) if the water has been present in the main for a long period.

The gas industry typically follows the following procedure to remove and handle the contaminated water:

1. Connect a Allan Taylor Unit (ATU) to a gas main stand pipe
2. Create a vacuum within the main to draw (syphon) the residing water from the main and into the ATUs water tank (400 litres)
3. The ATU typically travel to a number of pumping events before they reach their tank holding capacity and require emptying.
4. At a gas depot the contaminated water is transferred from the ATU into a larger syphon waste water tank.

A third party waste liquid handling company is required to remove the accumulated contaminated water from the tank by means of a large mobile tanker and transports the waste water off site to another holding tanker farm. It's not known how the third party company cleans and/or disposes of the contaminated water?

Method(s)

Stage one – Development: Identify and analyse a variety of suitable filtration media, to assess their effectiveness at removing the contaminants found in gas pipelines.

Stage Two – Prove Concept: Develop a suitable filtration system that relies on the proven filtration media. The aim is to apply the system to Northern Gas Networks existing ATU and Syphon Vehicles so that the contaminated water can be filtered and discharged into a foul sewer system.

Stage Three – Implementation: Develop an implementation programme with Northern Gas Networks including a best practice process and training guide.

Stage Four – Finalisation: Review future developments and collaborate with a close out report

Scope

The Scope of the project is to reduce NGN impact on the environment, by developing a filter (s) to capture impurities from syphon waste, through a filtration system on site so the water can be disposed of in a conventional way.

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Stage Three - Implementation

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Develop a training plan.

Stage four -

Review future developments.

Undertake a close out report

Objective(s)

- Identify and analyse a variety of suitable filtration media, to assess their effectiveness at removing the contaminants found in gas pipelines.
- Develop a suitable filtration system that relies on the proven filtration media. The aim is to apply the system to Northern Gas Networks existing ATU and Syphon Vehicles so that the contaminated water can be filtered and discharged into a foul sewer system.
- Develop an implementation programme with Northern Gas Networks including a best practice process and training guide.
- Review future developments and collaborate with a close out report.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

To have developed, designed, manufactured and testing of a fully proven containment system. The system will be capable of removing contaminants from water ingress found in gas mains.

Project Partners and External Funding

This project is completely funded by NIA finance.

Northern Gas Networks

Capture Green

Potential for New Learning

New learning could be developed in the following areas.

- Could be used with mains water extraction unit, remove the use of ATU.
- Could be utilised on incidents to shorten duration.
- Could be fitted onto a new tanker design.
- Capture toxins at source – less risk.

Scale of Project

This project plans to develop a prototype waste syphon filter system, which will take place in field trials under NGN's G23 process.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The solution will be development with Capture Green at their facilities in Colchester, Essex and trials will take place within NGN's network.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

NGN External expenditure - £41,035

NGN Internal expenditure - £13,679

Total NGN expenditure - £54,173

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)

NGN estimate that this could save up to £77,000 per year.

Please provide a calculation of the expected benefits the Solution

Direct Labour Organisation team hours est saving of £37,645

Direct Labour Organisation First Call Engineer est saving of £27,601

Back office support est saving of £108

Fuel saved est saving of £8,365

Est cost of customer complaints reduced £4,050

Total £77,769

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

This is an estimate for NGN's network. By using the ratio split of 4:2:1:1 for the other networks it can be estimated that this could potentially save a total of **£544,383** across the GDN's.

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

We are unable to provide an estimate for roll out at this moment in time.

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

All GDN's suffer with water ingress within their pipes, this project aims to develop a piece of equipment which all GDN's will be able to purchase and install within their network.

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

The project aims to deliver a piece of equipment which can be used to safely filter syphon waste . This has the potential to allow for waste water from syphons to be directly disposed into a foul sewer.
It addresses NGN's strategy focus areas of Enviroment Health and Safety.

☑ 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.

There is currenlty nothing on the market that is being used in conjunction with industry water extraction kits to filter waste water.

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

.

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

.

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 has been approved by a senior member of staff

☑ Yes