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

Mar 2021

Project Reference Number

NIA_NGN_285

Project Registration

Project Title

Safe Operational Framework for the Temporary Provision of Alternative Natural Gas Systems 3 (SOFTPANG 3)

Project Reference Number

NIA_NGN_285

Project Licensee(s)

Northern Gas Networks

Project Start

March 2021

Project Duration

1 year and 1 month

Nominated Project Contact(s)

Michael Charlton

Project Budget

£126,812.00

Summary

The concept of using CNG to provide a temporary and / or alternative fuel source is not novel and there are already a number of industries that use this approach at their facilities. “Virtual Pipelines” are becoming more common place and there are a growing number of CNG suppliers and transporters within the UK to meet this need. The concept of deploying this technology to support the Gas Transition Network and / or individual properties is new and there are technical and regulatory constraints that need to be addressed before this technology could be deployed operationally.

Third Party Collaborators

Energy Innovation Centre

Thornton Tomasetti

Nominated Contact Email Address(es)

innovation@northerngas.co.uk

Problem Being Solved

Following on from original findings in the first two SOFTPANG projects (which identified the feasibility of a temporary gas solution; it’s legal and regulatory restriction, potential advantageous technologies and training requirements to equip this solution) and the current COVID-19 Pandemic, there is an opportunity to use the findings and help mitigate the risk to customers and operational workforce where properties
that are identified as ‘high risk’ as a result of the Covid-19 pandemic and cannot be accessed by network engineers as part of planned operations.

COVID-19 has created an impact on the gas mains replacement programme (Repex) and as a result some ‘customer impacting’ work

had to be temporarily halted and timescales impacted. The original SOFTPANG project was to minimise impacts on the customer and their gas supplies during routine works and potentially emergency work, given the nature of the challenges presented by COVID-19 this now has further benefits associated to the solution originally envisioned in the original project.

Method(s)

In 2018, in partnership with Northern Gas Networks (NORTHERN GAS NETWORKS) and the Energy Innovation Centre (EIC), MMI Engineering (now trading as Thornton Tomasetti) collaboratively delivered the Safety and Operational Framework for the Temporary Provision of Alternative Natural Gas Systems (SOFTPANG) to minimise and/or avoid gas supply interruptions.

In 2020, NGN, the EIC and TT collaborated again to deliver phase 2 of the SOFTPANG project. In this phase, potential technologies identified in the original SOFTPANG project were reviewed against specified requirements. This process resulted in the recommendation of specific technologies to meet the requirements of NGN within defined scenarios.

This project will see the undertaking of field trials and deployment of a CNG based temporary supply, NGN and Thornton Tomasetti will work in partnership to co-ordinate and support the field trials of this technology.

Scope

The project will be delivered in two stages: -

- Stage 1 will see TT lead and co-ordinate field trials on the NGN network where small CNG bottles (less than 20kg) will be used as an alternative and temporary supply of gas to individual domestic properties.
- Stage 2 will see TT research and develop regulatory approvals to use CNG tanker gas as an alternative and temporary supply of gas to a larger number of properties, as well as co-ordinate test site trials on a controlled environment to prove technologies work.

Stage 1 and 2 will be accompanied with documentation and reports detailing operational processes / deployment for both stages.

Objective(s)

The work will be undertaken in two stages, with the first state being completed before the second commences so to allow for continuation of project members, we will be focusing on: -

1. Live field trials for CNG bottled gas
2. Test facility / site trials for CNG tanker gas

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The success criteria will include: -

1. CNG bottled gas used in live field trial sites as requested in G23
2. CNG bottled gas field trials documented individually in relation to success failure
3. CNG bottled gas field trials final evaluation and conclusions report drafted and presented to NGN
4. CNG tanker gas used in controlled test site as requested in G23
5. CNG tanker gas regulation approval developed
6. CNG tanker testing documented and final evaluation and recommendations written per live field trials

The identification of the safe deployment of both technologies.

Project Partners and External Funding

Northern Gas Networks
EIC
Thornton Tomasetti

Potential for New Learning

This project will generate learning relating to the innovation and development of a solution/blueprint to enable deployment of alternative natural gas to maintain supply to properties.

The project may generate for Northern Gas Networks, access to a system whereby they can maintain gas supply and deliver safety, environmental and cost benefits. This solution will be relevant to all GB GDN's as part of a network operations.

Scale of Project

The scale of this project will be as follows:

- Creation of a 'blueprint' that is approved for deployment of the final solution
- Production of evidence to confirm that the solution is robust and that all network requirements have been fully achieved with G23 approval being awarded

This has the potential to change the way that distribution works are completed specifically focused around activities where alternative gas supplies would be beneficial.

Technology Readiness at Start

TRL7 Inactive Commissioning

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

This project will take place within the Northern Gas Networks geographical area.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External Cost = £101,450
Internal Cost = £25,362
Total Cost = £126,812

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)

It is expected that if successful this project could provide Network Licensees with an opportunity to maintain supply during planned works without having to enter customer premises. This therefore provides safety benefits to operatives and customers during the COVID-19 pandemic an beyond.

Overall this project aims to support customers who may be in shielding, in quarantine/lockdown and those taking precautionary measures but still require critical replacement work on their gas service.The project will further improve customer experience, through enabling the use of temporary gas supplies (when the distribution network is unavailable). The use of which, is intended to reduce the number of occurrences of planned 'service' interruptions and shorten the interruption time for unplanned works.

Additionally, the effects are anticipated to minimize the exposure to gas service interruptions to its vulnerable customers, this can allow routine operations to be undertaken without undue risk being placed upon our operatives and on our customers. This therefore provides safety benefits to operatives and customers during the COVID-19 pandemic and future proofs networks.

Please provide a calculation of the expected benefits the Solution

Analysis indicates that there is a small quantitive cost benefit for this operation however the qualitative benefits are significant. Whereas the solution will also enable completion of repex activity with significant reduction of risk to network engineers and customers. Any quantitative benefits will be identified to enable capture thought development.

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

The network operations targeted in the scope of this project are undertaken by all GB networks therefore this project is applicable to all Gas Networks.

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

The implementation cost, post-completion of the project will be assessed and will be defined depending on the project outputs. The output of the project is expected to be a high TRL solution which is will be commercially available for all networks to deploy as part of network operations.

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 solution developed by this project is relevant to all networks as it directly relates to the tasks undertaken to enable continued supply to mains and services as part of the gas mains replacement programme.

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 links directly to the Distribution Mains Replacement, specifically the 'Optimised assets and practice' and 'Consumer Vulnerability' elements of the GNIS.

☑ 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.

A review has been made of all the SNP and all other Network Licensees and no other similar projects have been carried out. This project will build from the leaning generated as part of the previously completed SOFTPANG project. This project forms part of a wider group of Covid-19 focussed project discussed at regular cross-GDN forums.

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

The gas mains replacement programme requires the interruption of supply on every occasion where a customer is directly affected and also access to the property on predominantly every property. No solution exists to resolve this matter, and this is significant development and whilst this is a current challenge, at this time it is not yet know how long the impacts of Covid-19 will remain and therefore this innovation is essential.

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

No solution exists to resolve this matter, and this is significant development and an uncertain high-risk approach not covered by current regulatory arrangements as part of BAU.

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

No current method for and ‘access/interruption’ free operational way of working exists for this work type to allow networks to operate efficiently, albeit with opportunities to improve as documented above. The move to innovate and create a SOFTPANG blueprint will benefit social / environmental factors across the network and increased safety to the workforce and customers. Therefore, this is appropriate to fund via the NIA mechanism.

This project has been approved by a senior member of staff

☑ Yes