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 2014

Project Reference Number

NIA_SGN0001

Project Registration

Project Title

Synthotech Service Relay Initiative

Project Reference Number

NIA_SGN0001

Project Licensee(s)

SGN

Project Start

January 2011

Project Duration

3 years and 4 months

Nominated Project Contact(s)

Alex Stewart, Innovation Project Manager

Project Budget

£115,939.00

Summary

The scope of this project is to investigate and develop the capabilities of the Serviflex product range to allow for 3/4" service insertions with 20mm Serviflex, and 1" live service insertion from the customer's meter position.

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

SGN have been allowed a total of £1,804.1m for REPEX operations throughout RIIO-GD1 to replace the ageing metallic low pressure gas network and the associated service pipes. The relaying of a domestic service can be carried out using a number of methods, which can cause significant disruption to customers. Serviflex is a corrugated dual wall liner that when used with specialist installation equipment can negotiate tight radius bends without compromising the design life of the material. This method of relaying a service greatly reduces the amount of disruption caused, the time it takes to relay the service and the cost to SGN. Serviflex has been in use since the mid 1990s for the renovation of gas service pipes. The principle of operation is to avoid the need to relocate the gas meter from inside the property to a suitable external position. Serviflex has been used with great success to relay services, but in its current form can only be used on services 1" in diameter or greater and only after the service has been decommissioned. This project focuses on extending the use of Serviflex to cover ¾" services and to develop a method of inserting a service without decommissioning it.

The potential cost savings can vary depending on the length of service and the method that would currently be used to relay the new service i.e. ground mole or open cutting. Furthermore, the amount of copper work required to reconnect the customer also plays a large part in the labour resource, the materials required and ultimately the disruption to the customer.

Method(s)

The first part of this project (started under IFI) focuses on extending the use of Serviflex for replacement of 3/4" service pipes using the existing Serviflex pipe. A programme of development was put in place including, modification of installation equipment, performance

testing of installed pipe, development and testing of a suitable annular gap sealant. Some initial development work has been undertaken by Synthotech which has provided positive results from insertions into and through ¾" tight radius bend.

The second part of this project (also started under IFI) investigates extending the use of Serviflex to enable 1" live service insertion. This will follow standard live insertion methodology but will enable replacement from the existing meter position direct to the main connection (subject to maximum permitted insertion lengths). If successful this will eliminate the cost and environmental impact of excavation and subsequent reinstatement as well as greatly reducing the impact on the customer and general public.

The work carried out under IFI to date has covered the following milestones:

Milestone 1 - Development of Specifications and Procedures

- Development of theoretical method statement/instructions.
- Gap analysis between current practice/procedure/equipment.
- Development of a specific Serviflex insertion specification for testing.
- Development of parameters and scope of the project.

Milestone 2 – Feasibility Study

- Evaluate the gap analysis and identify possible solutions.
- Complete a cost benefit analysis about Serviflex insertion.
- Evaluate the parameters and scope of the project against anticipated probability.

Milestone 3 – Parts and Equipment Design Folder

- Concept design for installation equipment, annular sealant and connection fittings to existing network
- Procedure of operation.

Milestone 4 – Manufacture of prototype parts

Milestone 5 – System testing

- 75mbar with a safety factor of 2.
- Dynamic testing of insertion parts.

The final stage of this project will be funded from SGN's Network Innovation Allowance (NIA) and will address the following areas for both parts of this project:

Milestone 6 – Review of data and design folder and field trial

- Field trial of developed products across SGN's three networks.
- Concept review.
- Parts review.
- Procedural review.

Scope

The scope of this project is to investigate and develop the capabilities of the Serviflex product range to allow for ¾" service insertions with 20mm Serviflex, and 1" live service insertion from the customer's meter position.

Objective(s)

The objectives of the project are to:

- Reduce the interruption time for customers requiring a service relay
- Reduce the cost of relaying a service to provide better value to the customer
- Reduce and where possible eliminate the amount of excavation and reinstatement required
- Reduce the impact on the customer by reducing the quantity of services requiring meter boxes and copper work pipe reruns after relaying a service.
- Increase productivity by reducing the time taken to relay a gas service.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The successful development of the Serviflex system will provide positive environmental benefits with a reduction in the number of excavations required, the time taken and the impact on the customer:

In order to ensure that this project is a success, the project will be evaluated at the end of each project milestone. SGN's project manager will assess the outputs of each milestone upon completion before approving progress to the next stage. The success criteria for the project are to determine the extent to which the following targets are met by Serviflex system:

- Have a tool that will relay a service from an internal meter position using live insertion techniques
- Have a tool that will be able to insert ¾" steel services
- Eliminate the need to excavate to relay a gas service where ever possible
- Reduction in the amount of excavation required and the amount of material sent to landfill.
- A reduction in the quantity of third party damages caused due to the reduction in excavation taking place.

Reduction in average interruption time by 30%

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This two part project was originally started by SGN, working with Synthotech Limited in 2011. The key milestones one to five listed above in the 'Method(s)' section of this report already achieved and paid for under IFI funding. Transitioning into the NIA the remaining aspects of this project which will focus on field trialling and product review will be undertaken.

This project has been developed to progress through to full implementation and roll out following the successful demonstration of the solution in a live gas environment. Following the success of the trials, working procedures and training packages will be produced and SGN will demonstrate the new innovative solution to the other Network Licensees and support the dissemination throughout the UK.

Technology Readiness at Start

TRL6 Large Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

This project will be trialed in three depot locations, one in each of SGN's regional networks; Scotland, South and South East. The purpose of the trials being carried out in a number of depots is to ensure that the new product is used extensively in varying environments to ensure the findings are robust

Revenue Allowed for the RIIO Settlement

While no savings on revenue allowed for in the RIIO-GD1 settlement are expected during project implementation, if the technology is proven successful, there may be potential for future savings.

Indicative Total NIA Project Expenditure

The Initial cost of this project was funded from IFI (£86,761) between 2011/2013.

The remainder of this project is expected to cost £29,178, 90% of which is allowable NIA expenditure).

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)

SGN's service relay estimate for 2013 is 54,602 at an average cost of £726.50 each. It is anticipated approximately 20% could be saved on each service the new technique is used on.

Figures supplied by Synthotech estimate that the quantity of services this type of technology could potentially be used on (3/4" services and live inserted services) is approximately 12,000 per year. Using the revised figure of £576.50 per service shown below this would result in a saving of £1.8m per annum for SGN.

Please provide a calculation of the expected benefits the Solution

The total cost of labour and materials to perform the traditional technique in 2012/13 was estimated to be approximately £730.

The new process is anticipated to allow our Repex and repair teams to become more productive, eliminate the need for the meter box and copper work, avoid any potential disputes with the customer in regards to their meter box position and reduce the amount of reinstatement required. Hence we have made a conservative estimate of cost for equivalent service replacement using this method as approximately £580.

Therefore; the estimated savings will be £150 (Benefit Estimation for Development) per service relay.

This estimate is subject to a large sensitivity margin as it is based on averages and also depends on the actual outcomes of the project.

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

Based on SGN figures, the number of services where this technology could be used (3/4" services and live inserted services per year) was approximately 12,000. Based on a 4:2:1:1 split with reference to the size of the networks, it could be assumed that National Grid may have approximately 24,000 similar services and Wales & West Utilities and Northern Gas Networks have around 6,000 each. Therefore, the estimated total number of services this technology could be applied to on a per annum basis throughout GB is around 48,000.

While this estimate provides an indication of potential applicability, it is important to note it is necessarily based on a number of unqualified assumptions and therefore subject to a large sensitivity margin. However, since this project is developing an existing

technology used by all GB Network Licensees, wider roll out is likely to be easier than for a completely new technology.

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

Based on the figures above it can be estimated that GB roll out would cost around £27m.

In addition, due to the wide use of Serviflex across the UK, it is anticipated that each Network Licensee would be able to conduct their own internal training. As a result, following the completion of this project SGN will ensure that an initial training package is developed which can be replicated by all the Network Licensees. It is envisaged that this training package will then be delivered to each of the Network Licensees' training departments at a cost of approximately £10,000. Therefore, it is estimated that it will cost £40,000 excluding the supply of the equipment) to cover the initial roll out of the technology

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

This project is expected to provide all Network Licensees with two main learning points:

1. A method of live inserting a gas service from an internal position back to the main without the need for any excavation.
2. A method of renewing ¾" services without the need to relay the service, avoiding disruption to the customer and reducing the cost of the works.

The learning from this project will benefit Network Licensees as they are all currently using the original Serviflex system in their daily operations. Therefore, further development of this popular system will not only provide Network Licensees with significant benefits against the original system but even more important is the existing level of experience and expertise held in this area. As a result, it will be very easy for each Network Licensees to use the learning from this project to embed this new solution in their businesses.

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

n/a

☑ 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