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

Jan 2015

Project Reference Number

NIA_SGN0067

Project Registration

Project Title

Smart Paints and Coating Systems

Project Reference Number

NIA_SGN0067

Project Licensee(s)

SGN

Project Start

February 2015

Project Duration

3 years and 8 months

Nominated Project Contact(s)

Keith Ellison, Innovation Project Manager

Project Budget

£179,982.00

Summary

The scope of this project is to investigate the latest developments in paint and coating technology and products for use on SGN's plant. This would allow the potential for utilising more cost effective solutions for the protection of both above and below ground assets.

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

SGN has a requirement to carry out inspection and maintenance activities across its footprint of some 7629 regulator sites with paint and coatings being the primary means of corrosion protection for both above and below ground plant.

Current specifications (SP/PA/9, SP/PA/10 and SP/PA/11) require an on site paint inspector to oversee all paint and coating activities from preparation through to the final application whether the site requires a full paint coating of the whole site or what's called 'patch paint,' which is in essence a small area of corrosion that requires remediation. At present, a two part paints two part paint system which has limited time application is normally used. These are usually applied in three to four coats and are allowed to dry over a specific period. Due to the above the application of these paints and coatings is time consuming and even a small to medium site can take up to 3 months to prepare and coat.

As more modern paint systems come to the market SGN have identified a need to assess them for their suitability on the gas network and to review and update existing industry specifications to align them with currently available new technologies, products and suppliers.

Paint inspection and the standard of paints and coatings affect the overall health of assets. This project will therefore inform the Asset Health and Criticality Indices that are currently being reviewed and developed under various other projects.

Method(s)

In 2014 SGN looked at new paint technologies and applications a project was proposed to look at these new products.

Phase 1 Screening of Products and Technologies.

- Review of new and innovative paint coatings technology and products.
- Review, revise and formulate new coating technologies pre – screening functional and fitness for purpose performance qualification and ancillary documentation.
- Pre screening of new coating technologies for detailed performance laboratory and field testing.
- Preparation and development of proposals for phase 2.

Phase 2 Qualifications testing's and filed trials.

- Undertaking of laboratory performance testing.
- Complete field trial program.

Revise and combine the existing PA9 PA10 and PA11 and related documentation into one overriding policy and produce a simplified paint register.

Scope

The scope of this project is to investigate the latest developments in paint and coating technology and products for use on SGN's plant. This would allow the potential for utilising more cost effective solutions for the protection of both above and below ground assets.

Following the completion of the compatibility review of new and existing coatings there was technical issues associated selecting the pipe work for live testing. Suitable site and pipe work for the live testing had to be selected. For above ground paints and coatings the ideal pipe for testing was to be above ground subjected to the elements as well as a having good access around the pipe. For below ground coatings, there was engineering difficulties associated with finding an area where the pipe could be buried for a year without being disturbed. The live testing will commence in December 2016 and take a year to complete. This would allow a full evaluation of the smart paints and coatings on both below and above ground pipeline and allow us to understand the capabilities of the paints and coatings and assess the potential uses and savings to be made.

The change is beneficial because it allows learning to be delivered as planned with no change to the Project cost or potential net financial benefits.

Objective(s)

The objectives of this project are to:

- Introduction of new Paint and Coating technologies into SGN's activities which will potential reduce application costs for above and below ground assets and improve the life of the asset.
- Consolidation and updating of existing SGN specifications for Paints and Coatings will include suitable new technologies.
- Create a new SGN Policy approval of the new specification to allow their use within the network, to provide a safe and efficient cost effective solution, and the likely reduction in paint application waste disposal could both improve efficiencies and productivity.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The success criteria for this project is to trial and test the new paint technologies and methods and to simplify the paint selection process. The project will be determined to be a success if the following is achieved:

- Compatibility assessment of smart paint, coating technology and products with particular consideration to durability, practicality of application and price on all SGN assets.

- Risk assessment and gap analysis of relevant industry and SGN standards and specifications.
- Completed review of current specifications including assessment of current practice suitability in relation to applicable new technologies.
- Draft a new specification incorporating applicable new technologies.
- Completed technical report on results, findings and comparisons between new and existing elements.
- Carry out off site and on site field trials..
- Provide technical reports on previous installations and their successes rate.
- COSHH and Risk Assessments for all new products added to the paint register.
- Produce a Maintenance Work instruction, in SGN's SMF format, that enables the operative to select a suitable paint system for the equipment and the applications techniques required.
- Share the learning of this project with the other Network Licensees.

Project Partners and External Funding

None

Potential for New Learning

This project is expected to provide all Network Licensees with a fundamental understanding of what new paint and coating systems are available, improve and simplify the paint and coating selection process and introduce a new paint inspection systems

This project is expected to offer Network Licensees with a new products and technologies for above and ground assets, to provide a more efficient solution and is more cost effective compared with traditional techniques. SGN aims to disseminate the learning from this project via technical report, and practical demonstrations if required.

Scale of Project

In order to ensure that learning associated with this project is maximised and that the future paints and coatings of this technology are well understood, it is necessary to trial a good selection of sites across SGNs network. The field trials will allow SGN to assess the benefits of this innovative project and deliver learning as outlined above.

Technology Readiness at Start

TRL5 Pilot Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

All laboratory based research, design work, development and off site trials will be carried out at MACAW Engineering Ltd testing facilities in Newcastle upon Tyne. The live field trials to be undertaken will be carried out in a number of regulator locations in each of SGN's regional networks; Scotland, South and South East England.

Revenue Allowed for the RIIO Settlement

This is a high cost activity, for the remainder of RIIO-GD1. it is currently estimated that SGN will spend a further £3.5m on remediation painting of its assets.

Indicative Total NIA Project Expenditure

The total predicted project expenditure is £179,982, 90% of which is recoverable under NIA expenditure (£161,984).

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 make cost savings on paint inspection, therefore provide net financial benefits to customers, as a result of the improvements made to the existing method of maintain the integrity of the pipework and equipment.

Please provide a calculation of the expected benefits the Solution

A typical site of a medium to small size costs an estimated £100,000 to prepare and paint. The cost of a qualified paint inspector is approximately £300 per day which equates to an estimated £18,000 per site over a three month period.

SGN complete an average of 13 paint remediation activities of this scale per annum meaning an approximate £234,000 is spent on Paint Inspectors per year.

Furthermore, it is anticipated that a potential 25% saving per annum can be achieved due to the expected increase in asset life gained by utilising these new technologies. Based on remediating 13 sites a year, this equates to a potential saving of up to £58,500 per year due to extending the life of our assets.

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

This project has been designed to develop potential solutions to clearly defined industry challenges. Therefore, it can be assumed that this project shall provide Network Licensees with the opportunity to transfer the benefits of the new paint technologies techniques and applications into their businesses.

It can also be assumed that each network has a similar number of small to medium sites requiring to be maintained as SGN. Based on a 4:2:1:1, the potential saving could be as follows:

National Grid - 26 sites = £117,000 saving

Northern Gas Networks – 6 sites = £29,250

Wales & West Utilities - 6 sites = £29,250

Overall the total saving across GB per annum could be in the region of £234,000.

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

Excluding the cost of purchasing the equipment, it is anticipated that the cost of disseminating the development outcomes and findings from the project and training costs incurred before the product can be used would be approximately £7,500 for SGN. Based on a 4:2:1:1 the estimated total cost of training before the equipment can be used operationally throughout GB would be £30,000.

This estimate is based on the following assumptions: Four training courses for 12 people are provided for each Network Licensee from the manufacturer and Technical services provider in four separate locations across their network with an allowance for travel included, and approximate costs for one practical demonstration of the equipment by SGN for representatives from each Network.

It is anticipated that thereafter each Licensee would have their internal training departments carry out further training once the initial training program from the product manufacturer to a selective proportion of their workforce has been carried.

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 learning from this project will benefit Network Licensees as it will provide them with a clear evaluation of the current new

techniques and paint coatings. If successful the learning from the project will allow network licenses to make informed decisions on whether they would like to adopt our new proven policies and products. Where introduced, the learning will enable the new products and technologies to be used in each network, reducing the cost of applying coatings and inspections.

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

Current specifications (SP/PA/9, SP/PA/10 and SP/PA/11) require an on site paint inspector to oversee all paint and coating activities from preparation through to the final application whether the site requires a full paint coating of the whole site or what's called 'patch paint,' which is in essence a small area of corrosion that requires remediation. Currently used products use are normally a two part paints two part paint system which has limited time application, these are usually applied in three to four coats and are allowed to dry over a specific period. Due to the above the application of these paints and coatings is time consuming and even a small to medium site can take up to 3 months to prepare and coat.

As more modern paint systems come to the market the need has been identified to assess them for their suitability on the gas network and to review and update existing industry specifications to align them with currently available new technologies, products and suppliers.

Paint inspection and the standard of paints and coatings affect the overall health of assets. This project will therefore inform the Asset Health and Criticality Indices that are currently being reviewed and developed under various other projects.

☑ 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 of all other Network Licensees Innovation Funding Incentive (IFI) Annual Reports and NIA portfolios has been performed and no similar projects have been identified.

A similar review of current academic literature and journals has also been performed to avoid any potential overlap with the current project.

SGN have also engaged with the project partner and they have provided clarity that no unnecessary duplication of this project is currently being undertaken in GB that they are aware off.

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