

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

Jul 2014

Project Reference Number

NIA_SGN0045

Project Registration

Project Title

Orbis Oxifree (TM198) Corrosion Coating

Project Reference Number

NIA_SGN0045

Project Licensee(s)

SGN

Project Start

June 2014

Project Duration

2 years and 0 months

Nominated Project Contact(s)

SGN

Project Budget

£24,482.00

Summary

The scope of the project is to validate the product's suitability for use on GB gas networks. Work should include application of the method to a number of differing sites both above and below ground. This will allow the team to determine the potential success of the product in differing environmental conditions. Field trials should be conducted across the networks at a number of locations in order to highlight any areas or situations in which this product should not be used (i.e. engineering, social or geographic regions which may present challenging circumstances). Further, it might be included in the scope of this project to conduct regular 'checkbacks' on assets treated using this product to determine any changes to asset life expectancy. The project should finally be used to determine in particular, which assets and equipment are appropriate for use with this product (and any that are not suitable).

A work procedure should be produced and tested to ensure that a suitable protocol is in place for the product to be used safely and efficiently. A formal report should be produced and submitted to record all learning generated from the project to be shared with all appropriate parties.

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

Historically, a constant workload of the gas industry has been repair and replacement of corroded mains. Whether cast iron, spun iron, ductile iron or even steel, mains are susceptible to corrosion damage due to chemical and physical abrasion.

In order to prevent these problems from occurring, there are numerous techniques for corrosion avoidance. These methods include: paints or protective coat wrapping such as Denso, Cold Tar and PVC Over-Wrap. Although proven to prevent corrosion; paints and coat wrapping have various shortcomings which prevent a full realisation of their worth. Such issues can include:

- Paint detaching from the parent pipe line due to fracture/damage

- Protective wrapping over time is susceptible to degradation
- Flanges and valves require additional infill to seal the voids which are then over wrapped
- Manually applying protective systems to equipment is often very labour intensive
- Reapplying wrapping or paint can often require the removal of the old wrapping/paint which can prove both time consuming and labour intensive and can further result in damage to equipment and assets

Method(s)

Orbis Oxifree Corrosion Coating (or Oxifree) is a new (to the GB gas market) and environmentally friendly applied polymeric resin coating/encapsulation system designed to prevent corrosion. It primarily targets pipe flanges, valves and bolts but also acts as a barrier to stop ingress of dust and moisture into a wide range of assets.

Prior to application, the product is heated to a temperature of 170 degrees C in a purpose built machine and is then applied, via a heated hose and gun. The material is pumped at low pressure and forms an encapsulation which is around 4mm thick and does not adhere to the substrate. When applied, the product secretes oil which forms a barrier between the substrate and the polymeric resin to prevent air, moisture and contaminants from penetrating the coating/substrate interface. It also has an inhibitor quality which acts to reverse any established corrosion. The coating can be easily removed from the asset and melted down and reused, therefore this is a zero waste product both during and after the application process.

There are a range of application machines which can be used and these include a small machine for ease of transport and working in confined spaces and restricted access work areas (i.e. rope access). There are also larger machines for greater material capacity holding an ATEX approved for use in potentially explosive/fire risk zones.

Removing the encapsulation has been demonstrated to be very easy therefore allowing regular removal, inspection and re-application. This further supports the cost savings and environmentally friendly aspects of the product.

Scope

The scope of the project is to validate the product's suitability for use on GB gas networks. Work should include application of the method to a number of differing sites both above and below ground. This will allow the team to determine the potential success of the product in differing environmental conditions. Field trials should be conducted across the networks at a number of locations in order to highlight any areas or situations in which this product should not be used (i.e. engineering, social or geographic regions which may present challenging circumstances). Further, it might be included in the scope of this project to conduct regular 'checkbacks' on assets treated using this product to determine any changes to asset life expectancy. The project should finally be used to determine in particular, which assets and equipment are appropriate for use with this product (and any that are not suitable).

A work procedure should be produced and tested to ensure that a suitable protocol is in place for the product to be used safely and efficiently. A formal report should be produced and submitted to record all learning generated from the project to be shared with all appropriate parties.

Objective(s)

The objectives are to:

- Establish to what degree the validation testing for the offshore environment aligns with the validation requirements of the GB gas distribution environment, and to identify any testing gaps that may exist.
- Perform any offline material/application testing as identified in the above objective to give confidence that the Oxifree coating presents no risks if used on GB gas distribution assets.
- Trial the application of the Oxifree coating on a variety of networks assets to enable the following aspects to be assessed and determine:
 - Costs for the application of the system for various asset types against existing costs of repair.
 - Practicalities of using the coating system in a GB gas distribution network and the challenges of the varying environments.
 - The performance of the technology over a six month period as compared to similar assets that have not received protective treatment.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

In order to determine whether this project has been successful, the following key milestones will be achieved:

- Testing to determine whether the product can reach a point where no further offline testing is required.
- Assessment as to whether further testing will be required of applied coating
- Upon approval, a range of assets as identified by GDNs as part of the project are to be trialled with Orbis Oxifree Corrosion Coating. Inspections will be carried out to assess whether the coating has any form of detrimental effect on the assets.
- Assessment to determine whether the coating will contribute to an overall saving in asset life expectancy and associated costs.
- A comprehensive list of the extent to which the product can be applied. Thus establishing the potential benefits of the product.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project is designed to identify and perform only the testing that is specific to the GB network that has not already been conducted for other applications, therefore avoiding any unnecessary duplication or wasted resources.

The project will trial coat assets in 3 different locations in the WWU network, specifically, Weston Supermare, Maelor and Overton, to give a variety of application types and experiences, such as:

- Pipework
- Flanges
- Valves

Technology Readiness at Start

TRL6 Large Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

Three separate sites within our network will be tested. Each site will differ from the others to allow the system to be demonstrated in as many different locations and situations as possible.

Revenue Allowed for the RIIO Settlement

The costs identified as part of this project are within Controllable Costs (Opex) Maintenance. The maintenance activity includes all the activities associated with ensuring that all assets operate efficiently.

Indicative Total NIA Project Expenditure

The total Project cost is £24,482 of which 90% is allowable NIA expenditure (£22,034). The costs are being shared proportionally amongst the Network Licensees as follows:

NGG NIA expenditure - £ 7,204

SGN NIA expenditure - £3,601

WWU external NIA expenditure - £11,876

NGN external NIA expenditure - £1,801

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)

Potential savings as a result of implementation have been estimated up to £800k per annum.

Please provide a calculation of the expected benefits the Solution

AGI Savings

Savings in this area can be categorised into two areas; **reduced cost of additional paint of existing components** and **reduced cleaning of component costs**. On the assumption that the average site costs £10,000 (taken as an average for relevant jobs across all three of SGN's LDZs) and a third of that site is to be coated, we can assume a regular cost of approximately £3,300. However, the same job, using Oxifree is estimated to cost £3000 and therefore a saving of £300 per site can be achieved. SGN has indicated 300 of these sites are to be painted per year which would indicate a potential annual saving of £90,000 for SGN and £360,000 across GB.

Savings on Other Sites/Components

Gas pre-heater sites

• Assuming there are 330 pre-heater sites across the GB, which Oxifree could be applied to annually, at an estimated cost saving £300/site/year this equates to £99,000

Canal and River Crossings

• Assuming there are approximately 1000 overcrossings across GB, which Oxifree could be applied to annually, at an estimated savings cost saving £250/site/year this equates to £250,000

Total Annual GB Savings £709,000.00

Expected benefits that will be determined during trial is reduced deterioration of components allowing Networks to extend asset life beyond design life, reducing replacement rate over a 20 year period.

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

The method can be replicated across a high proportion of GB Network Licensees sites and assets. Additionally in circumstances where Network Licensees subcontract services from third party contractor companies, the method could also be adopted by these parties.

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

Two application examples are considered here, the use of the coating at above ground installations such as gas pre-heater sites and canal and river crossings:

Gas pre-heater sites

- Assuming there are 330 pre-heater sites across the GB, which Orbis could be applied to, at an estimated cost of £3,000/site this equates to £990,000

Canal and River Crossings

- Assuming there are 1,000 Overcrossings across GB, at an estimated cost of £2,000 this equates to £2,000,000

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 end of Project report will be shared with all Network Licensees detailing the performance of the method, the experiences and knowledge gained from each site trial and its limitations. This will enable all Licensees to have a deeper understanding of the circumstances and applications for the use of the method in their own 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)

This project addresses the challenge of smarter asset management by the networks and avoids unnecessary replacement by maintaining reliability in:

- Ensuring security of supply.
- Making better investment decisions.
- Developing an accurate Risk based approach to asset replacement.
- Delivering operational efficiency.
- Responding to changing requirements of the networks.

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