

## NIA Project Registration and PEA Document

### Date of Submission

Jan 2019

### Project Reference Number

NIA\_SGN0133

## Project Registration

### Project Title

ERS Module Regulator Conversion Phase 1

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NIA\_SGN0133

### Project Licensee(s)

SGN

### Project Start

November 2018

### Project Duration

1 year and 1 month

### Nominated Project Contact(s)

Keith Ellison Innovation Project Manager

### Project Budget

£84,368.00

## Summary

Currently there are 559 sites with ERS modules that were originally designed by British Gas Research centre in the early 1980's installed across SGN which are no longer supported by the original manufacture, and these are having to be replaced due to many assorted reasons. This can include obsolescence, the obtainability of spares, the soft spare parts are still produced but there is no support for the internal hard parts and the issues relating to the existing ERS module regulator configuration outdated and the general condition of the ERS Modules where a number are suffering from water ingress issues. Following a competitive tender exercise, DNVGL have been chosen to partner with SGN to complete the conceptual design of an ERS module regulator conversion.

### Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

## Problem Being Solved

Currently there are 559 sites with ERS modules that were originally designed by British Gas Research centre in the early 1980's installed across SGN which are no longer supported by the original manufacture, and these are having to be replaced due to many assorted reasons. This can include obsolescence, the obtainability of spares, the soft spare parts are still produced but there is no support for the internal hard parts and the issues relating to the existing ERS module regulator configuration outdated and the general condition of the ERS Modules where a number are suffering from water ingress issues. Following a competitive tender exercise, DNVGL have been chosen to partner with SGN to complete the conceptual design of an ERS module regulator conversion.

## Method(s)

Conceptual design to replace the ERS (Engineering Research Station) regulators contained within the buried module with a bespoke axial flow regulator cartridge system or suitable alternative, utilising the existing module to install the new bespoke cartridge system it is intended that the new unit will fit directly into the existing vessel and lead to minimum disruption of the network.

## Scope

The project will focus on the production of a conceptual 3D model & CFD of the ERS cartridge and the bespoke module for analysis and electronic testing, sourcing the Axial Flow Valve supplier or alternative. Undertake conceptual design study for the conversion process and report on the outcomes including CBA & prevention of water ingress to demonstrate that a phase 2 project to manufacture and field trial is a viable option to progress.

## Objective(s)

The objectives of this project are to complete conceptual design to replace the ERS (Engineering Research Station) regulators contained within the buried module with a bespoke axial flow regulator cartridge system or suitable alternative, utilising the existing module to install the new bespoke cartridge system it is intended that the new unit will fit directly into the existing vessel. It is envisaged that if this project is successful it would lead to; significant savings in not having to replace the ERS regulator modules

## Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

## Success Criteria

The project will be deemed successful if the following has been achieved:

- Project Kick-Off
- Produce 3D model of ERS cartridge and module for analysis and electronic testing.  
Test – 3D model received by SGN
- Source Axial Flow valve supplier and detail  
Test – Axial Flow valve supplier identified and costed & reported to SGN
- Carry out conceptual design study for conversion process, report on outcome including CBA & prevention of water ingress to determine if Phase 2 Manufacture and field trial is a viable option.

## Project Partners and External Funding

The project is to be wholly NIA funded & DNVGL have been chosen to partner with SGN

## Potential for New Learning

The project is expected to provide all Network Licences with fundamental understanding of whether it is possible to upgrade the exiting ERS Modules to prolong the assets life and prevent the environmental impact of having to replace these modules that were originally designed by British Gas Research centre in the early 1980's

## Scale of Project

This project is a conceptual design that will investigate the benefit of the ERS Module conversion design and information to progress to a phase 2 project to manufacture and progress through field trials.

## Technology Readiness at Start

TRL2 Invention and Research

## Technology Readiness at End

TRL3 Proof of Concept

## Geographical Area

The conceptual design will be undertaken at the partner offices with visits by the SGN staff to the locations as and when required. No field trials are planned during phase 1 of the project.

## Revenue Allowed for the RIIO Settlement

SGN's RIIO Allowance for Repair activities is £209.6m. Given that the Project is successful and identifies that a phase 2 project where ERS module conversions can be manufactured & trialed as an alternative solution it is likely that there could, potentially, be a reduction in the repair expenditure. It is envisaged this would be down to material costs, excavations, although this will become clearer as the Project progresses.

## Indicative Total NIA Project Expenditure

The total eligible NIA project expenditure expected to be £63,282 of which 90% £56,954 will be recovered via the NIA funding mechanism in line with the funding conditions.

## 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)

The project aligns to the target area of reliability and maintenance and aims to improve the Assets life cycle and additionally the environment from having to replace the below ground modules.

#### Please provide a calculation of the expected benefits the Solution

SGN Currently has 559 ERS Regulator sites & these figures have been based on the average replacement costs of 29 modules during 2015 which had an average cost of £61,116 however due to governor parts increased costs and contract rates the average cost of replacement of an ERS module is estimated to be £72,326, this possibly involves obtaining a new location for an above ground unit and excavations and the removal of the old ERS module regulators and backfilling. It is also anticipated that the other Networks will have similar numbers of these ERS Modules in operation

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

The potential outcome of this project is applicable across all GDNs

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

There are no costs associated with sharing the outputs and recommendations of this study with the other Network Licensees, which will be the first step to roll across GB.

### 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 Network Licensees will be able to use the learning generated as conceptual design of the proposed ERS conceptual module conversion solution and the outcomes can be shared in a final report. If the conceptual design is successful a Phase 2 project will be initiated to manufacture the units to trial on site. This new methodology is anticipated to deliver savings in lifecycle costs to benefit the networks.

### 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 aligns to the target area of reliability and maintenance and aims to improve the Assets life cycle and additionally the environment from having to replace the below ground modules.

- ☒ 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 Network Licensees and no other similar projects have been identified.

### 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

Currently obsolescence of the ERS Modules and the outdated functionality has been managed across the Networks by replacing these modules this project aims to prolong the assets life and bring these in line with current practices.

### 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

This is a conceptual design to investigate the potential benefits of developing a usable ERS module conversion that has the potential to prolong the assets life and to reduce excavations and backfilling and conforms to the NIA governance criteria.

## **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 NIA project has a low TRL and involves carrying out a conceptual design and proof of concept to develop a novel approach to remediating ERS modules and prolonging the assets life.

## **This project has been approved by a senior member of staff**

☒ Yes