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 2016

### Project Reference Number

NIA_WWU_030

## Project Registration

### Project Title

Project Blackout

### Project Reference Number

NIA_WWU_030

### Project Licensee(s)

Wales & West Utilities

### Project Start

January 2016

### Project Duration

0 years and 7 months

### Nominated Project Contact(s)

Jenny Brenton-Davies Network Control Manager (jenny.brenton-davies@wwutilities.co.uk)

### Project Budget

£141,644.00

### Summary

The project will be programmed in six phases. These are outlined below:

- **Phase 1** - Feasibility workshop, outlining all required tasks (both code development and testing) amongst both WWU engineers and all consultants.
- **Phase 2** - A basic demonstration of technical feasibility using representative data. A desktop exercise to develop & test a new software for reception and activation.
- **Phase 3** - Integration of technology elements. Experimenting with the control room interaction of the developed software
- **Phase 4** - Thorough testing of prototype software in a representative environment. A simulation using a dummy offtake to demonstrate developed software and test basic technology elements with existing software
- **Phase 5** - Feasibility demonstration in actual system application at a single site. Firstly at controlled site in Wales using Controller Type 1.
- **Phase 6** - Feasibility demonstration in actual system application at a single site. Secondly at a controlled site in the South West using Controller Type 2.

### Nominated Contact Email Address(es)

innovation@wwutilities.co.uk

### Problem Being Solved

An offtake is the point where Wales & West Utilities (WWU) take gas from National Grid, the high pressure National Transmission System (NTS). Currently offtakes are controlled directly by the WWU high pressure network control room operator through the WWU control system which uses telemetry via satellite and GPRS (mobile data service on the 2G and 3G cellular communication network). If telemetry fails the control room loses communications with the Offtake site, which we term as being a Blackout. In this event the site would control to it's safety pressure overrides and an engineer is sent to the site to manually control the flow of gas through the offtake.

Paper copies with descriptions of how manual changes to the outlet pressure profile should be made are held at site.

A project is needed to develop an innovative method of controlling offtake stations, in terms of the gas flow requirements in the event of a telemetry blackout & avoid the need for a manual profile setting.

The current contingency process is resource intensive and is a manual process to maintain safe pressures only.
As a company we are always challenging ourselves to do better by embracing new ideas and innovative solutions. WWU will develop an innovative method of controlling the gas flow at these offtake stations in the event of a telemetry blackout and avoid the need for a manual profile setting which is resource intensive and will assist the systems operation manager to maintain a reliable gas supply.

## Method(s)

This project will maximize WWU's recent upgrade of all remote telemetry units (RTU's) and develop a technical solution to enable these units to retain Offtake Profile Notices (OPN) data and use this information to control the offtake locally i.e. without use of telemetered data.
System Operation are required to submit to National Grid predicted flow requirements for all
WWU offtakes, at regular intervals (currently Offtake Profile Notifications are sent five times a day) during the gas day. This is officially agreed as part of The Uniform Network Code overseen by Ofgem. Deviation from the submitted flow profiles can result in capacity overrun charges (flat capacity breaches) and a significant impact on storage strategy which could impact on minimum network pressures given the correct conditions.

The new functionality will not be achieved by further equipment duplication, but by making the offtake outstation resilient to any central system or communications loss itself. It is proposed that further outstation software be developed to allow the outstation to automatically control itself, to the last known 24 hour flow requirements profile submitted to National Grid. This will require new coding software, to be developed by various consultants along with WWU staff.
The software will need to be written and extensively tested before being uploaded to the RTUs currently at our 12 volumetrically controlled offtakes. To ensure the solution works on all our controllable sites, we will test on two sites, each site using a different type of controller (Type 1 and Type 2). These two types of controllers are used across the majority of UK Distribution Networks offtakes.

## Scope

The project will be programmed in six phases. These are outlined below:
Phase 1 – Feasibility workshop, outlining all required tasks (both code development and testing) amongst both WWU engineers and all consultants.
Phase 2 - A basic demonstration of technical feasibility using representative data. A desktop exercise to develop & test a new software for reception and activation.
Phase 3 – Integration of technology elements. Experimenting with the control room interaction of the developed software
Phase 4 –– Thorough testing of prototype software in a representative environment. A simulation using a dummy offtake to demonstrate developed software and test basic technology elements with existing software
Phase 5 - Feasibility demonstration in actual system application at a single site. Firstly at controlled site in Wales using Controller Type 1.
Phase 6 - Feasibility demonstration in actual system application at a single site. Secondly at a controlled site in the South West using Controller Type 2.

## Objective(s)

To have 'intelligent' software installed at offtakes to allow sites to maintain optimal flow control in the event of a telemetry blackout. Flow control based on the most current Control Room strategy OPN data sent to National Grid. This will improve the quality of flow control during blackout periods making processes more efficient and robust and reducing the impact on the NTS and labour resources.

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

n/a

## Success Criteria

The development and demonstration of software which is tested for suitability and purpose so that in the event of a telemetry outage at any such offtake the RTU is capable of maintaining flow control based on a down loaded profile that is updated with a new file sent from the Control Room during the day.

## Project Partners and External Funding

n/a

## Potential for New Learning

n/a

## Scale of Project

This project will demonstrate the technology on two offtakes locations but WWU will develop the technology to be scalable up to all 12 volumetric offtakes.

## Technology Readiness at Start

TRL3 Proof of Concept

## Technology Readiness at End

TRL6 Large Scale

## Geographical Area

We plan to demonstrate the developed technology at a site in the South West area of England for a Type 2 controlled site and at a site in Wales for a Type 1 controlled site.

## Revenue Allowed for the RIIO Settlement

None

## Indicative Total NIA Project Expenditure

External Costs - £106,233

Internal costs - £35,411

Total cost - £141,644

Project Value claimable under NIA (90% of total cost) - £127,480

# 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)

This would reduce the immediate need for individual site attendance by WWU engineers in the event of a wide scale telemetry blackout. It is envisaged that site attendance would be required to confirm operation but on a less intensive basis i.e. not continuous for the period of the outage. This would leave resources available to deal with the overall telemetry outage problem.

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

A wide scale outage would necessitate site attendance at all 12 offtakes. The cost in man hours only limited by the extent of the outage. Assuming enough man power was available, site attendance by a two man engineering team, outside of working hours, is estimated at £120 per hour per site. Once implemented this is unlikely to negate the requirement for site attendance but would reduce the requirement to have to attend all sites and mitigate against the need to remain on a 24/7 basis. Site attendance at 12 sites by 2 men teams for 12 hours would currently be £18,720. Post project, a program of rolling site checks by one team of two men over 12 hours would be £1,440.
Another financial benefit would be mitigation against possible charges incurred due to a breach of our flat rate capacity flow rate agreed with National Grid. A charge would vary in amount based on flow volumes breached and the rate per site.
Estimated savings if a WWU wide telemetry outage occurred near peak demand day for a period of 12 hours , based on current offtake flat capacity charges, is estimated at £33,150.

Offtake Overrun Charges

These financial benefits are only applicable in the event of a full telemetry outage (Blackout) occurring and are based on cost avoidance rather than cost reduction. Although individual offtake outages occur reasonably regularly, outages involving all offtakes have occurred 23 times in the last 5 years, five of which were long enough to invoke the WWU emergency Blackout Plan. The last time the Blackout Plan was invoked was January 2015.

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

The software will be developed for use on a range of 1-12 offtakes. Both of the control type sites currently used across GB networks will be tested. We will report any increase on the range of limitations if they are known at the end of the project. This information will allow other GDNs to consider the solution demonstrated.

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

Cost of rollout across GB can be seen to be minimal as the same software can be used on other offtakes. Cost would involve time needed by suitable engineer to download software per offtake and suitable testing time plus deployment of tested coding required in Business Applications and SCADA.

### 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 idea of using software at site level to control offtakes is transferable. All large transporters such as National Grid, SGN and Northern Gas Networks use telemetry including RTUs to control their sites remotely.

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

We constantly strive to keep abreast of new technology and maximise the advances in this area to ensure that we are operating in the most efficient way for our customers. This project aligns to our strategy by supporting the desire to have better control of live data and in this example we will be able to control flow data remotely during a fault situation that has resulted in a disruption to telemetry – a first in the industry.

☑ 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