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 2020

Project Reference Number

NIA_WWU_059

Project Registration

Project Title

Permanent Leak Repair Clamps Phase 2

Project Reference Number

NIA_WWU_059

Project Licensee(s)

Wales & West Utilities

Project Start

March 2020

Project Duration

1 year and 1 month

Nominated Project Contact(s)

Darren Cushen

Project Budget

£172,323.00

Summary

A project that will enable Wales & West Utilities to install a permanent leak repair clamp to a High Pressure (HP) pipeline and develop a decision tree for WWU to carry out future works.

Nominated Contact Email Address(es)

innovation@wwutilities.co.uk

Problem Being Solved

The LTS pipeline network within the UK was installed as long ago as the 1950's many of these pipelines are operating in excess of their original design life. With an emphasis on risk based approaches to intervention and increased financial constraints the wholesale replacement of LTS pipelines is becoming harder to justify. As a direct result there will be an increasing number of ageing pipelines operating within the UK. While these pipelines have a very good cathodic protection system in place which works to help slow the deterioration of the pipeline, it is inevitable that in areas with an increased rate of corrosion and areas of stress concentration there will be leakage.

WWU operates approx. 2,300 km out of the 20,000 km of major accident hazard LTS gas pipelines in the UK (owned and operated by NTS and the GDNs). Much of the LTS pipelines that operate in Wales cannot be inspected using the OLI1 technique, as the pipes are too small. While there is a robust above ground monitoring programme in place the data collected is not as accurate or detailed as the OLI1 data. This leaves WWU very susceptible to leakage on its high pressure network.

Current procedures state that inspection and repair of damaged steel pipelines designed to operate at pressures greater than 2 bar, that has undergone a temporary leak repair using a leak clamp must be revisited and the clamp replaced with a permanent repair within 12 months of the application of the temporary repair. The project aims to deliver a cost effective and permanent solution to leaks which are currently undergoing a temporary fix and are revisited at a later date in order to perform a costly cut out or short length diversion.

Method(s)

This project proposal builds and progresses upon the successes of a previous innovation project, Permanent Leak Repair Clamps

(NIA_WWU_040). This project has now been completed with a view of how a common emergency pipeline repair strategy could be developed for the management and repair of leaking pipelines by providing sound engineering process for our engineers to follow. The project also recommended that a Bolted Structural Repair Clamp (i.e. Double Seal Clamp) would be the best solution as a permanent leak repair method and this was reached following a review of all relevant standards in relation to how WWU perform leak repairs on pipelines, as well as standard practice within gas industry worldwide regarding repair of pipeline leaks.

A typical bolt-on clamp consists of two halves bolted together with elastomer seals around the circumference of the pipe and along the bolting face to contain the pressure from a leaking pipeline. The clamps are usually designed to contain full pipeline pressure and are generally installed by bolting onto the pipeline at the defect location.

It is proposed that we will demonstrate the use of a Double Seal Clamp for a permanent repair of a small leak located at a ditch crossing on a 6-inch pipeline in North Wales (HN029 Tryfil to Llangefni).

The project will investigate market availability and indicative costs of a clamp, developing a cost benefit analysis to evaluate the benefit of a double seal clamp over the current solution of a temporary Plidco Clamp. The project will develop a work procedure and risk assessment for the installation of the clamp and the removal of the temporary clamp, the clamp will then be installed onto the network. We will develop a method to remotely monitor the clamp for the remainder of the assets life using available logger technology and using alarm systems for immediate alerts

Scope

- Stage 1: IRMS to check market availability and indicative cost of “Double Seal Clamp” (with monitoring point) from potential suppliers Partner
- Develop Cost Benefit Analysis
- Develop event-based decision tree on the possible repair scenarios
- Stage 2: Develop flow charts / story board or sequence of activities that will be involved in the removal of standard Plidco Leak Clamp already installed on any WWU pipeline. This will be the engineering procedure
- Develop flow charts / story board or sequence of activities that will be involved in the installation of Double Seal Clamp
- Develop Clamp Installation Risk Assessment. The risk assessment will be developed in conjunction with WWU and shall be utilised during the installation of the Double Seal Clamp
- Stage 3: Installtion of Double Seal Clamp

Objective(s)

This project will provide the understanding needed to remove a temporary clamp and replace with a permanent solution on a High Pressure Pipeline.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

Success will be Wales & West Utilities understanding the options available to repair a high pressure pipeline with a permanent solution.

Project Partners and External Funding

The partners are IRM Systems and Pipelines Maintenance Centre (PMC). The project will be fully funded via NIA.

Potential for New Learning

A permanent solution to the repair of a High Pressure Pipeline, without the need for an expensive diversion.

Scale of Project

The project will undertake field trials on the Wales & West network

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

Within the Wales & West network, specifically North Wales.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

External: £129,242
Internal: £43,081

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 anticipated that if the project is success, in certain circumstance a diversion would not be required. Diversions are expensive and time consuming. The removal of a clamp with a permanent clamp its place should be a quick and less expensive alternative.

Please provide a calculation of the expected benefits the Solution

The costs of a cut outs/diversion are in the region of £100k - £300k depending on the size and complexity. A leak on a pipeline which would result in a 60m diversion of 6"HP pipe would cost approx. £275,000.

The estimated price of a clamp and installation is in the region of £60,000

In this example a permanent clamp being used instead of a diversion could see a saving of £215,000

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

This is fully replicable across the entire GB network, roll out would be dependent on how many leaks the other networks may have.

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

It is envisaged purchase of clamps would be completed by a 3rd party and installed on an adhoc basis. Therefore roll out costs would be minimal, as purchase and installation would only been needed when there is a leak on the network.

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 information collected through the project will be directly applicable to other gas distribution networks, in terms of assessing the appropriateness of extending the operating life of temporary leak clamps beyond the maximum 12 months. The use of temporary leak clamps is consistent across the other GDN's within the UK.

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.

The Smarter Networks Portal has been investigated and no other projects of this kind have been undertaken since the last phase.

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

Before research was completed during the previous project, networks were unaware of what was available or suitable as a permanent solution. It has so far not been possible to complete a permanent repair on a HP pipeline until now.

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 project did not form part of the RIIO GD1. It requires funding outside of this

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

There is currently no existing method that allows networks to remove a temporary clamp and install a permanent solution. Without the project partners expertise, we would not be able to develop the appropriate methods to complete the project.

This project has been approved by a senior member of staff

☑ Yes