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

Oct 2016

Project Reference Number

NIA_WWU_037

Project Registration

Project Title

Feasibility study – Small Unmanned Aerial Systems

Project Reference Number

NIA_WWU_037

Project Licensee(s)

Wales & West Utilities

Project Start

October 2016

Project Duration

0 years and 6 months

Nominated Project Contact(s)

Ben Morgan (LTS Pipelines Asset Manager)

Project Budget

£14,593.00

Summary

The proposed project runs for approximately 5 months and is a single phase project. The research objective is to assess the opportunity presented by drone technology within visual line of sight. The scope of the project is to assess the application of within line of sight drone technology to undertake existing survey requirements. A survey will be undertaken to compare drone captured data against traditional survey techniques, specifically targeting risers and above ground crossings. The report will document restrictions and opportunities associated with the drones ability to access different types of locations. The findings will be summarised by a report that will be shared on the Smarter Networks portal.

A third party will be utilised to co-ordinate with the drone provider and WWU's operational teams. The third party will then assess the data and develop a report outlining the below:

1. Is the drone data collected good enough to inform engineering based decisions
2. If so what type of assets could be surveyed to give meaningful data
3. What are the lessons learnt from the process leading up to trails
4. Any future options/next steps

Nominated Contact Email Address(es)

innovation@wwutilities.co.uk

Problem Being Solved

Surveying methods of above ground pipelines for asset condition in the UK have remained largely unchanged. The availability and use of drone technology as a service is becoming more widespread and widely available both in the UK and internationally.

Drones are used in many sectors including military, and retail for a variety of applications to replace or enhance existing techniques. They are also used to deliver previously unrecognized benefits such as 3D imagery and bird eye perspectives.

As yet the utilisation of drone technology has not been widely considered within the gas industry and the technology could have the

ability to offer the industry new capabilities that reduce cost and operational risk, whilst simultaneously improving efficiency.

Method(s)

The project will focus primarily on physical trials. 2 trials will be undertaken with a drone provider. The first will be to replicate the requirements of an existing survey and then to compare the strengths and weaknesses of the collated data and process. The learning from this survey comparison will then be used to assess the strengths and weakness of undertaking other types of surveys by drone.

The second trial will focus more specifically on proving the utilisation of drones to access hard to reach areas. One of the key strengths of drone technology is in the versatility to access difficult locations, which currently cost WWU considerably when traditional methods are required such as scaffolding or cherry pickers. The second trial will then look to evaluate the capability for drones to undertake surveys on these inaccessible areas.

Scope

The proposed project runs for approximately 5 months and is a single phase project. The research objective is to assess the opportunity presented by drone technology within visual line of sight. The scope of the project is to assess the application of within line of sight drone technology to undertake existing survey requirements. A survey will be undertaken to compare drone captured data against traditional survey techniques, specifically targeting risers and above ground crossings. The report will document restrictions and opportunities associated with the drones ability to access different types of locations. The findings will be summarised by a report that will be shared on the Smarter Networks portal.

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Objective(s)

Assess and report on the suitability of using drone technology to undertake surveys routinely carried out by gas networks.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

1. Understanding the strengths and weakness of drone surveys against traditional techniques. Specifically looking at the captured data and process.
2. Understand the strengths and weakness of drones to access and collect data for hard to reach areas.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project will incorporate 2 field trials and a third party report. This information will be analysed by WWU to influence a final report outlining the objectives findings.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The trials will be based around the South Wales area but the findings will be applicable to a wider UK geography.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

External Cost - £10,945

Internal cost - £3,648

Total NIA Expenditure - £14,593

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)

If the technology proves to be a viable alternative to collecting data via traditional means this can remove the need for high cost scaffolding. In order to inspect an above ground crossing contained within a bridge WWU recently spent £20k to hire a tailored cherry picker from Germany. This was comparable to a scaffolding cost of £200k but still substantially more expensive than a drone survey at around £2k.

The exact range of applications is not yet fully understood so full cost benefits are not possible, however assuming a reduction in scaffolding costs of £10k per year is envisaged.

Please provide a calculation of the expected benefits the Solution

This is a research project

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

This is a research project

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

This project only looks at the applicability of the technology, costs associated with undertaking the surveys either by in house training or contracting in the service are not part of this project.

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 drone technologies against existing surveys techniques. Many of the existing survey techniques are consistent across the GDN's and as such the findings will be directly applicable to the other gas 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)

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.

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