NIA Project Registration and PEA Document

Date of Submission

Mar 2021

Project Reference Number

NIA_SPEN_059

Project Registration

Project Title

Landslide Protection Asset

Project Reference Number

NIA_SPEN_059

Project Licensee(s)

SP Energy Networks Distribution

Project Start

March 2021

Project Duration

1 year and 4 months

Nominated Project Contact(s)

Gavin Montgomery

Project Budget

£210,000.00

Summary

This project will study the vulnerability of the transmission network to damage from landslips and landslides, and prove the use of a landslide protection system.

Third Party Collaborators

Mott MacDonald

Nominated Contact Email Address(es)

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Problem Being Solved

Landslides or landslips are a relatively rare event but their impact can be catastrophic, in the recent past Scotland has experienced landslides which have caused serious impact to road and rail infrastructure. Within SPEN we have also been affected, in 2019 a landslide occurred which had an impact on a pylon on the YW route near Loch Katrine to the north of Glasgow. The incident resulted in repair costs circa £1m which would have been much greater had the network not remained intact.

By its nature our Transmission network is routed through a multitude of different hostile terrain such as peaty hilly land, shallow ground cover over rocks, high water tables etc. Presently there is limited knowledge within the business of the risk of damage to our assets posed by landslides. It is therefore impossible to implement mitigation measures to vulnerable parts of the network.

Method(s)

We have identified a two stage process in order to tackle the problem which form the basis of the NIA project proposal. Firstly, we will engage with a supplier to undertake a GIS tiling task and develop software that will generate a RAG database identifying where on their network landslides are most likely to occur. This tool will improve our sight of vulnerable parts on the network by identify pylons where risk is deemed high. This phase of the work will be desk based and carried out by a Consultant, the output will be a database with RAG status attributed to assets across the Transmission network in the SPT area.

The second part of the project would be to deploy a 'pylon protection system' to a pylon of high risk selected from the RAG database. Mesh netting systems are commonly used as protection against landslides for other assets such as roads and other civil infrastructure however they have not been implemented on Pylons in the UK. We will work with a supplier of meshing system to design and install a landslide netting system which meets the requirements of our safety rules.

Scope

The desktop study will cover the YW route within SPT. The YW route covers a multitude of different hostile terrain such as peaty hilly land, shallow ground cover over rocks, high water tables etc, hence highlight any trends in the most at risk locations and what causes them for future knowledge.

The design and installation of the pylon protection system will be provided to 1 of the pylons deemed high risk on the YW route.

Objective(s)

The key objectives for the project are:

- To develop a RAG database of assets which are highly vulnerable to impact from landslides. The database will enable SPEN to assess the pylons at most risk to be impacted from landslides and to apply appropriate mitigation measures.
- To prove that installing mitigation measures can be done safely to a selected 'high risk' pylon.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The project will be deemed a success should the objectives be fully met:

- To develop a RAG database of assets which are highly vulnerable to impact from landslides. – Success criteria will be an easily readable database of assets on the YW route with a clear definition of those which are at high risk.
- To prove that installing mitigation measures can be done safely to a selected 'high risk' pylon.
- Success criteria will be delivery of the installed protection system in line with our safety rules including development of relevant policies and procedures.

Further, the project will bring SPEN in depth knowledge on the causes and likelihood of landslides in an area where a critical part of the network is routed. Future assessments of landslide risk can be based on a sound and reasoned understanding of ground conditions.

Project Partners and External Funding

n/a

Potential for New Learning

The project will bring detailed knowledge in the management of the risk posed by landslides and landslips and how this could affect the network in the future, and the management and reduction of this risk.

Scale of Project

The desktop study will cover the YW route within SPT. The YW route covers many types of terrain so results will be replicable to other areas.

The Pylon Protection system installation will cover 1 pylon selected on the route.

Technology Readiness at Start   ## Technology Readiness at End

| TRL6 Large Scale | TRL8 Active Commissioning |

Geographical Area

The project will be based on the YW route which runs from Windyhill, North of Glasgow to Dalmally in Argyle.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

£210,000

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)

Overall landslides are a low risk high impact event and it is not possible to quantify the likelihood of an event occurring prior to the initial desktop study being carried out in the first phase of the project. The recent land slide event on the YW route near Loch Katrine cost around £1m in repair bills. There would have been significantly higher cost had the network not remained intact. Return on investment will be achieved should the landslide protection asset avoid one further incident on the network.

Please provide a calculation of the expected benefits the Solution

Quantification cannot be made prior to work on the initial risk assessment being carried out.

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

The project will be replicable to all licensees across GB which have terrain similar to that within the SPEN region.

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

N/A

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 project will develop learning in relation to ground conditions and land slide risk on a route which covers a variety of diverse terrains. The learning from the route will be applicable to many other locations across GB where pylons may be located in areas susceptible to landslides.

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 supports our key theme of 'System security and stability' which has been identified within our innovation strategy. Maintaining the integrity of assets will be central to achieving system stability particularly in a world where reduction in conventional generation and increase in non synchronous, embedded generation place greater demand on the network resilience. Reducing the impact from landslides will result in a much stronger and secure network.

☑ 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 search was conducted on the smarter networks portal and no other projects investigating the impact of landslides to Transmission assets were found.

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

While land slide protection has been applied to other infrastructure such as roads or rail the technique is novel to the transmission network particularly as consideration of safety rules must be applied to the design and installation.

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

The use of software based assessment for landslide and trial of a protection system has not been included for in the T1 price control therefore this cannot be part of our business as usual activities.

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

Without NIA funding the commercial risk associated with the trial could not be borne by the business. This is the reason for the required support of the NIA fund.

This project has been approved by a senior member of staff

☑ Yes