

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

Dec 2019

Project Reference Number

NIA_SHET_0030

Project Registration

Project Title

TACAMA

Project Reference Number

NIA_SHET_0030

Project Licensee(s)

Scottish and Southern Electricity Networks Transmission

Project Start

December 2019

Project Duration

1 year and 1 month

Nominated Project Contact(s)

Colin Mathieson

Project Budget

£59,800.00

Summary

SSEN continues to develop an extensive Transmission Network to support both generation and subsea interconnectors. As a consequence, the population of cable assets operating at 132kV continues to increase, generally all of which are extruded XLPE. Cable failure at 132kV and above, although uncommon, is extremely costly due to the necessary repairs and potential loss of network capacity. Unanticipated cable failures can occur due to a lack of routine maintenance which for cables generally consist of pressure testing to detect any defects.

Nominated Contact Email Address(es)

transmissioninnovation@sse.com

Problem Being Solved

SSEN continues to develop an extensive Transmission Network to support both generation and subsea interconnectors. As a consequence, the population of cable assets operating at 132kV continues to increase, generally all of which are extruded XLPE. Cable failure at 132kV and above, although uncommon, is extremely costly due to the necessary repairs and potential loss of network capacity. Unanticipated cable failures can occur due to a lack of routine maintenance which for cables generally consist of pressure testing to detect any defects.

Conducting tests on 132kV cables and above during commissioning stages, following repairs or having any aspirations to increase the testing frequency would be difficult and costly due to the cumbersome and restrictive nature of the traditional methods and equipment used. With the development and use of extruded XLPE cables various modern operational testing technologies have been developed that may provide both improved cable diagnostics and easier access to equipment. However these new technologies for testing cables require further evaluation and assessment to determine their efficacy, costs and benefits.

Method(s)

Engage an independent Technical Specialist/Expert in the field of cable testing and diagnostics to investigate available technologies, produce a report and recommendations in relation to their findings.

Scope

To undertake a desktop study of current and emerging testing and diagnostic technologies from around the world relating to cables operating at 132kV and above.

Objective(s)

To learn and understand new testing and diagnostic approaches for electricity cables operating at 132kV and above, recommend preferred methods and create an implementation strategy for the business.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

To successfully conduct the proposed study and to create and define a tailored strategy/methodology for deploying the most promising testing approaches on SSEN's Transmission Network.

Project Partners and External Funding

None

Potential for New Learning

This project has the potential for learning about:

- New, emerging and innovative cable testing technologies being adopted across the world
- Understanding the perceived life cycle benefits in using and/or adopting these technologies in managing SSEN cable assets
- Understanding the efficiencies and cost benefits or otherwise of implementing such technologies

Scale of Project

The scale of the project is limited to a desktop study utilising recognised expertise in the field of cable testing and diagnostics associated with electricity cables operating at 132kV and above whether AC or DC.

Technology Readiness at Start

TRL5 Pilot Scale

Technology Readiness at End

TRL7 Inactive Commissioning

Geographical Area

Desk Top Study N/A

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

The total expenditure expected from the project is £59,800. 90% (£53,820) of which is allowable NIA expenditure.

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 study provides an opportunity to identify and assess new technologies associated with cable testing and diagnosis that could ultimately increase asset life and/or predict emerging faults therefore improving C/CML.

Please provide a calculation of the expected benefits the Solution

Not required for this research project.

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

The output of this project could be implemented on cable installation sites and locations across all the Network Licensees.

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

Relatively minimal as this would be dictated by a procurement exercise coordinated by users and owners of cables operating at 132kV and above.

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

This study provides an opportunity to identify and assess new technologies associated with cable testing and diagnosis that could ultimately increase asset life and/or predict emerging faults therefore improving C/CML.

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

This project specifically addresses new methods of asset health assessment leading to improved network reliability.

- 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.

Based on a review of the projects registered under IFI, NIA or NIC there has been no other project which specifically focusses on assessing and recommending the most recent and emerging cable testing and diagnostic processes specifically operating at 132kV and above.

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

Technology is constantly changing in relation to electricity cable testing therefore review and appraisal of the latest processes is necessary to assess whether the new innovations and developments can benefit the business.

Relevant Foreground IPR

n/a

Data Access Details

n/a

Please identify why the Network Licensees will not fund the project as part of it's business and usual activities

The desk top study will provide guidance on possible options from which the business can then determine which options to pursue.

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 is a knowledge gathering exercise which will be beneficial to the Utility industry.

This project has been approved by a senior member of staff

Yes