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

Nov 2013

Project Reference Number

NIA_NGET0048

Project Registration

Project Title

Cables with Long Electrical Sections

Project Reference Number

NIA_NGET0048

Project Licensee(s)

National Grid Electricity Transmission

Project Start

April 2012

Project Duration

5 years and 5 months

Nominated Project Contact(s)

David Scott

Project Budget

£412,000.00

Summary

The SVLs are generally installed in public places and are critical to the circuit operation. As a result of this multiple circuits have been placed on enhanced maintenance regimes. These regimes require a major maintenance to be carried on the affected circuits annually opposed to being carried out every 3 years. Long electrical sections are also of interest as several new cable circuits are proposing to be installed with long electrical sections.

Nominated Contact Email Address(es)

box.NG.ETInnovation@nationalgrid.com

Problem Being Solved

In 2000 – 2002 midlife refurbishments were carried out on several cable circuits, mainly within London. As part of these refurbishment works the old link boxes were to be removed and new above ground pillars were fitted. At this time system studies were carried and it was found that the length of major electrical sections could be extended, therefore reducing the number of link pillars that were required, eliminating the need for extra easements to be obtained and reducing ongoing maintenance requirements. However it has been found that circuits where the length of the electrical sections has been extended are suffering from multiple failures of the sheath voltage limiters (SVLs) fitted to the cable bonding system.

Method(s)

he method that has been proposed for this project includes:

Report identifying the affected circuits and the extent to which they were modified

Interim report on the analysis of failure data

Design and commission on-line monitoring systems for SVLs

Interim report on electrical modelling of affected circuits

Report on laboratory testing of SVLs

Report on forensic investigation of SVLs recovered from service

Report on electrical modelling of affected circuits

Interim report on the cause of the SVL failures

Recommend remedial measures to reduce the instance of SVL failures and limit their consequences

Final Report

Scope

The SVLs are generally installed in public places and are critical to the circuit operation. As a result of this multiple circuits have been placed on enhanced maintenance regimes. These regimes require a major maintenance to be carried on the affected circuits annually opposed to being carried out every 3 years. Long electrical sections are also of interest as several new cable circuits are proposing to be installed with long electrical sections.

Objective(s)

The objective of this project are to provide National Grid with the following information;

An understanding of the steady state and transient performance of cables with long electrical sections.

An awareness of the failure mechanisms and life limiting factors of cable sheath voltage limiters (SVLs)

Recommendations for the future of operation and maintenance of cables with long electrical sections

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

This project is successful if the knowledge is sufficient to give reccomendations for business implementation to improve the SVL cable issue.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

This project is appropriately scaled in order to deliver the required benefits to customers. The work is being competed in a laboratory.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL5 Pilot Scale

Geographical Area

The project will give us knowledge to implement on the whole of the National Grid Electricity Transmission system where cables are installed.

Revenue Allowed for the RIIO Settlement

Zero

Indicative Total NIA Project Expenditure

NGET NIA project expenditure is £412,000

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)

The enhanced maintenance regime costs in the region of £60k annually and requires 2 members of staff per outage, 6 circuits for 1-2 weeks. Therefore if a solution can be found to return these circuits to a standard maintenance regime costs could be reduced and staff availability could be improved.

Please provide a calculation of the expected benefits the Solution

Base case - 60,000

Method cost – zero if the problem is solved.

B-M = 60,000

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

This can be applied to 100% of affected sites.

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

Unknown, this could provide us with extra issues that we have not considered before, or highlight that the only way to fix the problem is to re-install the circuit. These costs are just too uncertain to confirm but will form part of the final deliverable.

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

n/a

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 addresses the theme of reliability with a focus on optimizing asset management of cable circuits.

☑ 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