Scottish & Southern Electricity Networks

Date of Submission

October 2015

NIA Project Registration and PEA Document

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.

Project Registration

Project Title		Project Reference
Alternative Cable Installation Methods (ACIM) – Phase 1 (Feasibility Study)		NIA_SSEPD_0016
Project Licensee(s)	**Project Start Date**	**Project Duration**
Scottish Hydro Electric Power Distribution, Southern Electric Power Distribution	Oct 2015	15 Months
Nominated Project Contact(s)		**Project Budget**
David MacLeman		£130,000

Problem(s)

New connections to distributed generation, replacement or reinforcement of underground cable networks are part of the standard operations of network operators. Underground cables could be either directly buried or installed within ducts. Factors such as the characteristics of the asset, rating and the installation/ overlay environment influence the decision which method is more beneficial to be used.

Commonly, cables are either designed as direct buried asset or as ducted systems, and involve open cut trenches in order to be laid. There are additional business-as-usual cable installation options, such as ploughing and horizontal directional drilling which are well established and are applied to particular environments only.

Open cut trenching, which is the most frequently used method for cable laying, although well understood, it presents some drawbacks:
• It is a costly method and causes significant disturbance to the customers.
• In addition, the common limitations placed to DNOs in order to minimize the disturbance of the open-cut trenching and the characteristics of the methods itself (i.e. pulling through a winch) limit the amount of cable that can be installed without joints, which are considered as weak points of the network. Traditional maximum length between joints on 132kV is up to 1km and at lower voltages is commonly up to 500m, although quite frequently due to limitations placed on length of open cut trenches, the cable length without joints is much reduced.
• Finally, traditional open cut trenching requires operation from both ends of the route and such fact increases the cost in cases where it is not technically or economically feasible to construct a receiving pit at the end of the route.

Method(s)

The method is to identify innovative methods for installing cables either within ducts or direct laid that could offer reduction in cost and could increase the length of the cable that can be installed without joints.

The outcome of the feasibility study will be knowledge gained as described below:

• Whether there are innovative solutions with the potential to reduce the number of intermediate jointing bays and increase the length of cable that can be installed at one pull and thus improve the network performance and reliability (by minimizing the number of joints added on the cable). In addition, minimizing the number of jointing bays will reduce the cost and duration of the cable installation activity.

• Whether there are innovative solutions with the potential to reduce the cost of the cable installation activity.

Scope

The project aims to identify innovative cable installation methods that can reduce the cost of cable installation and increase the length of cables without having a joint. If the project identifies viable technologies, a second NIA project with the actual implementation will be considered.

Phase 1 (Feasibility study)
• Undertake a requirements gathering exercise internally within SSEPD
• Work with the standard 'business as usual' cable suppliers to identify the maximum length of cable that can be supplied on the cable drum.
• Appoint an external company to undertake a 'horizon scanning' exercise and identify innovative solutions for cable installation. The company will also support SSEPD in the supplier selection process.
• Undertake a procurement exercise in order to identify and select candidate innovative solutions for cable installation.
• Develop a report with recommendations in order to proceed to the design phase
• Undertake site selection and select appropriate installation method(s)
• Agree commercial terms with the parties of the supply chain that will need to be coordinated in order to provide the identified innovative solution(s).
• Arrange with the supply chain (cable installers, cable suppliers, product developers, etc.) the development of the deployment plan of the selected methods (implementation plan, H&S plan) which is expected to include surveys of the candidate site(s).

Objective(s)

• The project will determine whether there are innovative methods for cable installation that have the potential to reduce the cost of the cable installation/ laying exercise and/ or increase the length of cable that can be laid.
• The project will determine whether it is possible to increase the standard cable length and determine what the maximum cable length that can be manufactured and supplied within a drum is.
• The project will determine the construction/ implementation plan for the next phase.

Success Criteria

The project will be considered a success if it determines whether or not there are innovative methods for cable installation that have the potential to reduce costs and/ or install long sections of cable without joints.

Technology Readiness Level at Start	Technology Readiness Level at Completion
3	4

Project Partners and External Funding

n/a

Potential for New Learning

The project will allow the network operators to identify if there are innovative methods that can reduce the cost of cable installation and increase the length of cable that can be installed without joints.

Scale of Project

The scale of the particular site that the potentially identified innovative methods could be tested will be determined within the project in order to reflect the requirements of SSEPD and the capabilities of the identified methods.

Geographical Area

The project will be focused in SEPD Area (South Central England). In case that a suitable site cannot be located in this area, the project will investigate the availability of sites in the SHEPD area in Scotland.

Revenue Allowed for in the RIIO Settlement

None

Indicative Total NIA Project Expenditure

Total NIA expenditure will be £130,000 of which 90% (£117,000) is Allowable NIA Expenditure.

Project Eligibility Assessment

Specific Requirements 1

1a. A 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 systems and 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	☐

Specific Requirements 2

2a. Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees ☒

Please answer one of the following:

i) Please explain how the learning that will be generated could be used by relevant Network Licenses.

The learning that will be generated will be available to other DNOs in order for them to assess whether or not the possibly identified methods can be used on their own underground network.

ii) Please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the Project.

2b. Is the default IPR position being applied?

Yes	☒
No	☐

If no, please answer i, ii, iii before continuing:

i) Demonstrate how the learning from the Project can be successfully disseminated to Network Licensees and other interested parties

ii) Describe any potential constraints or costs caused or resulting from, the imposed IPR arrangements

iii) Justify why the proposed IPR arrangements provide value for money for customers

2c. Has the Potential to Deliver Net Financial Benefits to Customers ☒

i) Please provide an estimate of the saving if the Problem is solved.

The financial benefit will be estimated at the end of the project. The feasibility study will inform the estimate of the saving and It is anticipated that a worth while reduction in the cable installation cost may be achieved. This could be through a reduction in the

number of jointing bays, need for receiving bay at the end of the route and possibly reduction in the construction time.

ii) Please provide a calculation of the expected financial benefits of a Development or Demonstration Project (not required for Research Projects). (Base Cost – Method Cost, Against Agreed Baseline).

n/a - research project

iii) Please provide an estimate of how replicable the Method is across GB in terms of the number of sites, the sort of site the Method could be applied to, or the percentage of the Network Licensees system where it could be rolled-out.

The methods of installing cables that may be identified will be able to be replicated within any other DNO network, where they are utilising ducted systems or directly buried cables for underground cabling.

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

The identified methods will be required to reduce the cost for the cable installation and possibly increase the length of cables that can be installed. The costs for rolling out the method will be determined as part of the project, and cannot be determined at this stage, as they are dependent on the methods that will be identified and selected

2d. Does Not Lead to Unnecessary Duplication 

i) Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

SSEPD is not aware of any other network operator having undertaken a similar activity in the past. SSEPD identified that within the currently running NIA projects, Scottish Power Energy Networks (SPEN) has engaged in a project called ‘Mini Mole’ which aims to develop a miniature/ portable directional drill excavation unit, as an alternative to open cut trenching for LV and Service cabling. In case a similar idea is identified from SSEPD as part of the procurement process of the proposed project, SSEPD will assess the use case of SPEN against the proposed SSEPD use case and decide whether it is worth proceeding or need to reject the idea in order to avoid unnecessary duplication.

ii) If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

n/a