Scottish and Southern Energy
Power Distribution

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

LV Connectivity Modelling

Project Reference

NIA_SSEPD_0015

Project Licensee(s)

Scottish Hydro Electric Power Distribution, Southern Electric Power Distribution

Project Start Date

Oct 2015

Project Duration

9 Months

Nominated Project Contact(s)

David MacLeman

Project Budget

£246,000

Problem(s)

As the need for the distribution grid to become more flexible increases due to distributed generation and changes in demand, there is value in DNOs having a more comprehensive end to end map of the Low Voltage (LV) network down to individual consumer premises. This more comprehensive map, or connectivity model, will lead to improvements in customer service. The work involved in investigating all the individual connections and creating a comprehensive model would be manually intensive, and costly in terms of manpower.

Method(s)

One potential solution is to create the model in software which removes much of the need for extensive fieldwork and manual interaction with the LV connectivity. As a result, the process can be quicker, less costly and just as accurate. This project explores this methodology.
The project is a technical method which will use data analytic techniques, with software from Bit Stew Systems, to align Meter Supply Points, their addresses, with local Substations to produce a connectivity model that can show the link between substation feeders and individual premises.

Scope

This project will develop a LV connectivity model using software to align meter supply points with local substations so that the links between substation feeders and user premises can be shown. These results can then be compared with the existing LV model, to give a level of confidence in using data analytics for this requirement.
The project will use a small section of the LV network in Bracknell, 10 Substations with approx. 2000 connected properties, so that we can compare the data analytics model, with that obtained by manual means.
Data from the Metering Point Registration System and the Geographical Information System will be provided to Bit Stew Systems for them to produce the LV connectivity data.
The area of the network to be analysed, has already been mapped as part of the Tier 2 Thames Valley Vision project being undertaken by SEPD.

Objective(s)

The output of the project is to produce LV connectivity diagrams, using software, for the trial area which is within an acceptable level of accuracy when compared with the manually derived diagram.

Success Criteria

The project will have been a success if the end conclusions are able to make a justifiable statement that the use of data analytics techniques with the available data are either 1) able to make an accurate LV connectivity model, or 2) not able to make an accurate LV connectivity model.

Technology Readiness Level at Start	Technology Readiness Level at Completion
8	9

Project Partners and External Funding

n/a

Potential for New Learning

The project will improve our understanding of how data analytics can be used to improving knowledge of LV network connectivity.

Scale of Project

The project is to show if there are any benefits in using data analytics to develop a full network connectivity map, as such it will use a small sample of existing data, and the scale of the project is deemed adequate for the anticipated work.

Geographical Area

This work will be done in the Southern Electric Power Distribution licence area

Revenue Allowed for in the RIIO Settlement

There is no revenue allowed for in the RIIO ED1 settlement

Indicative Total NIA Project Expenditure

The project expenditure will be £246,000 , 90% of which is allowable NIA expenditure (£ 221,400)

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.

Any Network Licencee that does not currently have a full LV connectivity map will be able to use the process developed, and the software commercially available from Bit Stew, to develop a LV connectivity map of their licence area. This process will use data analytics, and the project will be able to advise what level of data will need to be provided to successfully carry out the process.

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.

If the network connectivity can be determined through data analytics, rather than by the current labour intensive method, then the savings would be over £10 million for the SSEPD network.

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).

Base cost of determining network connectivity for 1470 premises across 10 substations is £138,500
Method cost of replicating a successful project for 1470 premises across 10 substations is £26,000
Financial benefit of the project is £112,500.

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 method is replicable across all of the UK distribution networks as the techniques used are replicable across all DNOs if the data is tailored expressly for this use.

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

The costs to other DNOs would have to include hardware costs, either using cloud hosting or using internally hosted servers, and software licensing costs. Bit Stew Systems will negotiate with interested DNOs on the level of licence required, and the level of support needed.

2d. Does Not Lead to Unnecessary Duplication ☒

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

SPEN have registered a project (NIA_SPEN0009) considering how data analytics can be used as an aide to decision making. The SPEN project is a higher level and does not focus on a precise area in the same manner as our project as this project is designed to look solely at the problem of LV Network connectivity mapping, without going through the full work package process that SPEN are undertaking.

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

The project being carried out by SPEN (NIA_SPEN0009) will look at the quality of all data held by the company, and trying to develop techniques for improving the quality of the data. The improved data would then be able to be used for decision making within the business to determine benefits for investment and asset replacements.
This project is focused on developing a LV network model to improve customer service through a more accurate understanding of the LV network.