

NIA Project Registration and PEA Document

Date of Submission

May 2016

Project Reference Number

NIA_WPD_016

Project Registration

Project Title

Common Information Model

Project Reference Number

NIA_WPD_016

Project Licensee(s)

National Grid Electricity Distribution

Project Start

May 2016

Project Duration

2 years and 5 months

Nominated Project Contact(s)

Jennifer Woodruff - Innovation & Low Carbon Networks Engineer

Project Budget

£751,744.00

Summary

The main areas of work within the project are;

1. Extending the process of matching data from the various systems to 33kV, 66kV and 132 kV networks
2. Test the benefits of having a network model in CIM format network in terms of software adoption and integration. i.e. test the hypothesis that having a CIM format model greatly simplifies the process of adopting a different planning tool, supporting a suite of niche planning tools, or creating interfaces between systems.
3. Test the benefits of having a network model in CIM format in terms of data exchange with third parties. i.e. data exchange over DNO boundaries, with National Grid or IDNOs, Local Authorities, Academic bodies. etc.
4. Test the benefits of having CIM format network models when creating system interfaces.

PowerOnFusion is expected to be used as a repository for the CIM format network model and to support testing of import, export and interfacing functions.

Problem Being Solved

DNOs typically have asset data residing in several separate systems. The data held supports the function of each system e.g. asset management, geographical representation or network control. The systems will differ in the assets that are included and may not reference the same asset with the same unique reference. Additionally there may be a reliance on manual processes to keep systems aligned. This leads to the following problems

1. It is hard to identify and rectify data quality issues
2. A dataset that is rich enough to support complex analysis cannot be exported from any one system.
3. Individual data formats slow the adoption of new software as the custom tailoring of data is expensive and time consuming.
4. Exchanging data with third parties is also time-consuming and may not provide all the data required.

Method(s)

The Common Information Model for electricity is an international standard developed to support exchange of electrical network information and could be used to support the information layer of the smart grid architecture model. Project FALCON successfully combined data for the 11kV network from key systems to create an Integrated Network Model and this project will initially build on that work to create a comprehensive, accurate and portable network model in CIM format. The benefits of having data in this format will then be tested to determine whether there is a business case to convert and maintain data in this format and a requirement in the future for our software to support CIM format.

Scope

The main areas of work within the project are;

1. Extending the process of matching data from the various systems to 33kV, 66kV and 132 kV networks
2. Test the benefits of having a network model in CIM format network in terms of software adoption and integration. i.e. test the hypothesis that having a CIM format model greatly simplifies the process of adopting a different planning tool, supporting a suite of niche planning tools, or creating interfaces between systems.
3. Test the benefits of having a network model in CIM format in terms of data exchange with third parties. i.e. data exchange over DNO boundaries, with National Grid or IDNOs, Local Authorities, Academic bodies. etc.
4. Test the benefits of having CIM format network models when creating system interfaces.

PowerOn is expected to be used as a repository for the CIM format network model and to support testing of import, export and interfacing functions.

The project duration has been extended to cater for a large delay created by the availability of the supporting hardware. Some of the hardware, once specified and subsequently ordered, was recalled by the manufacturer for a considerable duration. This has necessitated a delay to the project, but does not change cost and outputs. The project will finish on 30th June 2018.

Objective(s)

- To extend the existing Integrated Network Model for 11kV to export data in CIM format.
- To create a replicable process to combine data for 33kV and 66kV and 132kV networks to identify data quality issues and provide a CIM format output.
- To test the benefits that arise from creating a CIM format network model in terms of software adoption, information exchange and system interfaces.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- A specification is written and tested for the network area.
- A usable CIM format model has been produced to include 33kV, 66KV and 132kV networks.
- The format model will then be shared with interested 3rd parties.
- Feedback Question provided to third parties and the responses returned are then used to further inform next steps.

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

The project scale is at 33kV, 66kV & 132kV. The 132kV networks have been included to enable data exchange with National Grid.

The network area selected will result in a network model being available for other projects. It is anticipated that should this prove successful that a project based in BaU, but potentially run by WPD Future Networks Team, will then be established across the whole geographic footprint.

Technology Readiness at Start

Technology Readiness at End

TRL4 Bench Scale Research

TRL5 Pilot Scale

Geographical Area

The project will use a specific region (Cornwall) within WPDs DNO area which will act as an initial feasibility study. This will then be extended to other areas within the South West to widen the variety of assets included and reflect a variety of legacy data but the initial proof of concept has sufficient scale to test the hypothesis.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£619,799

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)

There will be financial gain associated with the benefits listed below. These are particularly hard to measure but we have provided more information on them below;

1. Improved data quality.
2. Improved data sharing.
3. Reduced software adoption costs.
4. Improved reporting.
5. Supporting competition in network connection and connection planning.

A lot of the cost savings, should this method be proven, we believe will manifest themselves of a prolonged period. However, having undertaken the follow on measures to implement this solution across the four licensed areas we believe that there will be cost savings for the business which will therefore benefit customers directly through cost savings/better customer service and improved information sharing.

Please provide a calculation of the expected benefits the Solution

The financial benefits of this work are extremely difficult to calculate because this is the first step in a complex chain of follow on events. One of the aims of this project is to understand the value of having the data in CIM format so it is difficult to state the value before the project. It is anticipated that if this project proves the hypothesis that a series of follow on projects will be undertaken within the business to a) detail the benefits from the results of this project and then b) create a programme of work based on the business case.

Should this project prove to be successful we anticipate the following outline benefits:

- Improved data quality will lead to less data handling and validation- this may save a number of man hours of work across the business per annum. However, it is difficult at this point to put a precise number on this. This improved data quality will lead to simpler reporting, especially where the process to create the CIM results linking between data items that currently lack common keys.
- Reduced Software adoption costs- the business, we believe, spends a relatively significant amount of money per annum "customizing" software to integrate with our current applications. We believe that this can be reduced by the use of CIM standards.
- Improved data sharing- This is likely to increase the value to the third parties receiving the data rather as it should be easier for them to use with a wider variety of software packages. There is expected to be a reduction in cost where this data is shared back to WPD e.g. completed designs from an IDNO.
- Improved losses assessment- if we can make more accurate losses assessments this may mean reduced costs to customers

however we do not currently have a viable method for assessing the impact of this as this is a real unknown. This trial we believe will give us an insight into the potential for this. We have however come up with a broad estimate of what we think for the South West Region is a reasonable estimate of the benefits as follows:

- Reduced data handling we believe would save us one FTE per annum.
- Reduced software adoptions costs would save us one FTE per annum.
- Improved Data sharing could we think save us one FTE per annum.

Three FTEs we would think save us £180k per annum, but we think across the whole four GSPs this could increase to nine FTEs, of course this would be year on year savings and therefore it makes sense to undertake this analysis now. However the estimates are such that we think that this is a justification for undertaking this piece of research. We intend to undertake this project via a series of 6 sprints across the lifecycle in order to maximize the potential for early wins as well where the method is proven to work. This we feel will make the project results available on an incremental basis and provide early warnings and signposts.

In addition we believe that customers will see other perhaps less tangible benefits through customer service by way of better data/ more consistent data and better information sharing.

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

The learning from the CIM analysis work will be transferable to all other DNOs and we intend to proactively engage with them around the results on an ongoing basis.

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 learning from the project will include;

- Details of the CIM data scheme adopted.
- An overview of data quality issues found at different voltages.
- Results of the tests to import, export and interface CIM data.
- A view of the degree to which CIM format eases software adoption.

This could influence the data strategies of other DNOs who would be able to share any software / algorithms developed to manipulate asset data to CIM format.

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

n/a

☒ 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