NIA Project Registration and PEA Document

Date of Submission

Feb 2016

Project Reference Number

NIA_WPD_011

Project Registration

Project Title

Time Series Data Quality

Project Reference Number

NIA_WPD_011

Project Licensee(s)

National Grid Electricity Distribution

Project Start

February 2016

Project Duration

1 year and 1 month

Nominated Project Contact(s)

James Bennett - Innovation & Low Carbon Networks Engineer

Project Budget

£163,800.00

Summary

Two years' worth of historic time series data for the South-West License are will be taken from the available databases and used for data analysis by a specialist 3rd party contractor. A set of repeatable and scalable processes shall be established to;

- Identify gaps

- Identify suspect/defective data

- Create rules to replace missing/defective data

- Assign directions to power flows

- Identify the causes of suspect data through common patterns

The project will also look at what other information could be incorporated in to the 'Big Data' analytics to further validate data quality.

Problem Being Solved

Distribution Network Operators keep historic time series data from a wide variety of sources across the network within a number of databases which can be interrogated on an 'as needed' basis, generally for planning purposes. Due to the sheer volume of data, errors, omissions and underlying trends are difficult to spot by relying on manual intervention alone. This project seeks to investigate the use of data analytics to understand data quality and identify trends and issues which would not be identifiable to the human observer.

Method(s)

Established 'Big Data' analytics techniques shall be used by a third party to process the huge amounts of time series data held for one licence area in order to identify data quality issues and emerging trends.

The processes and outcomes shall be documented in order to replicate across the other licence areas and to other DNOs.

Scope

Two years' worth of historic time series data for the South-West License are will be taken from the available databases and used for data analysis by a specialist 3rd party contractor. A set of repeatable and scalable processes shall be established to;

- Identify gaps
- Identify suspect/defective data
- Create rules to replace missing/defective data
- Assign directions to power flows
- Identify the causes of suspect data through common patterns

The project will also look at what other information could be incorporated in to the 'Big Data' analytics to further validate data quality.

Objective(s)

- Produce repeatable processes that can accurately identify the conditions set out above
- Produce lists of actions for the appropriate business units regarding any defects found
- Produce recommendations to improve time series data quality based on the outcomes of the project

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

- Accurate identification of the conditions set out in the scope
- Successful correction of defects found
- Improvements to business processes based on recommendations from the project

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

One license areas worth of data shall be used for the purpose of this trial as performing studies per license area provides the simplest way to undertake data extraction from multiple systems. The outcomes from the project shall be scalable to include data from other areas in the future.

Technology Readiness at Start

TRL5 Pilot Scale

Technology Readiness at End

TRL7 Inactive Commissioning

Geographical Area

South-West License Area

Revenue Allowed for the RIIO Settlement

Nil

Indicative Total NIA Project Expenditure

£147,420

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)

More accurate time-series data will allow targeted smarter interventions which in turn will enable a reduction in load related reinforcement by 1% over RIIO-ED1.

Please provide a calculation of the expected benefits the Solution

It is envisaged that once the analytics processes are established they can be within normal business processes. Expected financial benefit = £115,000.

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

The method is easily replicable across the whole of the GB network licensees.

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

Once the principles are established then the actual roll-out cost will vary dependent on each DNOs in house processing capabilities.

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

As all UK electricity DNOs collect time series data in some form the learning gained from this project would allow for more efficient working practices to be adopted across the country.

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