

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

Oct 2022

Project Reference Number

NIA_SPEN_0080

Project Registration

Project Title

Data Historian Replacement

Project Reference Number

NIA_SPEN_0080

Project Licensee(s)

SP Energy Networks Distribution

Project Start

May 2022

Project Duration

1 year and 11 months

Nominated Project Contact(s)

Rebecca Eccles, Paul Johnson

Project Budget

£200,000.00

Summary

Like many businesses SPEN is collecting far more data now than it ever has before. The current data historians used within the company are long established (20+ years) and costly. In recent years, data storage has become cheaper and many more options are available now than there were before. To this end, SPEN undertook a quick proof of concept in 2021 to establish if a generic time series database such as InfluxDB will be able to fulfill the requirements of the company. It was predicted that InfluxDB will be approximately 7 times cheaper than PI historian over the ED2 period.

This project digs deeper to test if InfluxDB can integrate appropriately with SPEN systems. The InfluxDB Phase 2 PoC will host real time data from LV power quality monitors in parallel with the PI Data Historian. There is also a budget to establish how PowerOn would cope with a change in data historian as the current interfaces are PI Historian specific.

Nominated Contact Email Address(es)

innovate@spenergynetworks.co.uk

Problem Being Solved

It is estimated that the cost of the current data will be in excess of £1.7million through ED2, this is prior to consultancy fees. The amount of data being stored is due to increase exponentially over the next 5 years (and beyond). The company is tied to the PI Data Historian system for the storage of analogue data. The PI System implements a pricing model based on volume of data stored or queried. By testing and proving the suitability of a generic solution SPEN can demonstrate that these volume priced alternatives are viable alternatives to traditional datapoint-based such as the PI Data Historian, benefitting industry in general. There are additional benefits in adopting solutions such as InfluxDB:

- These products can be priced as OPEX rather than CAPEX reducing up front cost impact.
- The systems are scalable and costed accordingly. Cost of data storage will grow as the data goes rather than paying for storage not yet used as is the case with more traditional data historian solutions.

Moving to a generic time series database will ensure that the company can adapt and grow in the future and not be tied to the pricing mandate of AVIVA OSISoft.

Method(s)

A list of deliverables has been created and these will be investigated alongside Capula Ltd., the current consultants for PI historian.

SPEN have new LV monitors coming online this year and the data from these will be used as a test case for InfluxDB. The data will be stored in parallel with PI historian and comparisons between the performance of the databases will be investigated.

The data will be collected using connections to SPEN's Smart Data Integration Fabric (SDIF), an enterprise service bus. Data security will be through this mechanism and using the WS02 Security Layer, the data will then be stored in (preferably) a cloud implementation of InfluxDB. A data connection from InfluxDB will be created to SPEN's Azure Synapse environment. In addition to these tasks, the performance, costs, and administrative tools for InfluxDB will be investigated.

In addition, the viability of interface mechanisms between PowerOn and InfluxDB will be assessed.

Scope

A 7-month project to set up and evaluate an InfluxDB data historian environment connected to SPEN's infrastructure.

Objective(s)

This project will assess the suitability of generic time series databases to act as a data historian, this in turn will give more choice and better competition between providers going forwards.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

N/A

Success Criteria

Use £200,000 to establish if it is possible to move away from PI Data Historian in ED2, it is expected that the PI Data Historian would cost £1.7 million during the ED2 period and that InfluxDB will cost significantly less than this - around a 7th of the cost.

Project Partners and External Funding

N/A

Potential for New Learning

Improve competition between data historian options by:

- Testing if generic time series databases can fulfill the requirements of a data historian
- - Testing if cloud time series databases can connect to SPEN infrastructure
- - Test the cloud time series database performance
- - Test the cloud time series admin tools
- Assess the cost of these databases
- Assess how cloud databases grow with use over time

Scale of Project

This 'Proof of Concept' project phase will last 7 months with costs of £200,000. After this phase, a Management Information strategy decision will be made to see if the model can be implemented as Business as Usual (BaU) so that the LV Monitor data can be stored in InfluxDB indefinitely.

Technology Readiness at Start

TRL1 Basic Principles

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

SP License areas

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£200,000

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:

-

How the Project has potential to benefit consumer in vulnerable situations:

-

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)

N/A

Please provide a calculation of the expected benefits the Solution

Reduction in data historian costs throughout ED2. The cost of PI is estimated to be £1.7 million (Cap Ex), InfluxDB (OpEx) is £232,000 over the ED2 period. These figures do not include consultancy fees.

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

100% of the targeted benefits will be available to all companies storing data, especially those using PI.

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

To be determined following this Proof of Concept project.

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)

N/A

Is the default IPR position being applied?

Yes

Please demonstrate how the learning from the project can be successfully disseminated to Network Licensees and other interested parties.

-

Please describe how many potential constraints or costs caused, or resulting from the imposed IPR arrangements.<

-

Please justify why the proposed IPR arrangements provide value for money for customers.

-

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.

This project is the first of its kind with regards to investigating the options to move away from PI historian and opening the data historian market up to include generic time series databases.

There are no other NIA projects that are innovatively looking into this area.

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

This project is the first of its kind with regards to investigating the options to move away from PI historian and opening the data historian market up to include generic time series databases.

There are no other NIA projects that are innovatively looking into this area.

Relevant Foreground IPR

N/A

Data Access Details

Data can be made available in line with our information sharing policies.

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

The business case for using a contemporary time series database such as InfluxDB as a data historian solution in the UK energy networks sector is unproven and therefore SP Energy Networks will not fund a trial as a business as usual activity.

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

There are technical and associated commercial risks associated with the trial. For example:

Shifting from a traditional wholly owned self-hosted data historian to a cloud-based service requires a fundamental shift in mindset when it comes to architectural implementation and system management. It is important that the SPEN IT and business community can assess the viability of such services as an alternative to conventional approaches, both from a functional and cost of ownership perspective. Bearing in mind the unproven nature of this technology within the UK energy networks sector, and the reluctance of the licensee to take a tradition BaU approach, it is obvious NIA funding support is essential to assessing the effectiveness of the technique and its commercial viability.

This project has been approved by a senior member of staff

Yes