

Energy Networks Innovation Process Project Close Down Form



Notes on Completion: Please refer to the NIA Governance Document to assist in the completion of this form.
Do not use tables

Step 1 - Initial Project Details

Project Title

Network Event & Alarm Transparency (NEAT)

Project Reference

WPD_NIA_053

Project Contact(s)

Jenny Woodruff

Project Start Date

10/20

Project End Date

06/23

Scope (15,000 Characters Max) Ctrl + Z to count words in the selected cell.

The management of alarms and events within Distribution Network Operator (DNO) control rooms is well established. However, as DNOs are transitioning to become Distribution System Operators (DSOs) and more actively managing the network this is introducing new alarms into their control rooms. The addition of systems to enable Active Network Management (ANM) or System Voltage Optimisation (SVO) are being introduced to make better use of existing assets and defer traditional reinforcement. These new systems bring with them different types of alarm and event notifications relating to the processes they are carrying out. The ANM system covering Cornwall and the SVO system covering Devon and Somerset both include features to model the operation of the network and carry out power flow analysis. The SVO system also includes functionality for State Estimation to provide data to the power flow analysis where monitored values are not provided by the Supervisory Control and Data Acquisition (SCADA) system.

These systems therefore have new types of alarms and events relating to;

- the state estimation system failing to provide data with a sufficient confidence factor
- the power flow analysis failing to converge
- the power flow analysis identifying overloads/voltage violations in real time or in the short-term future.

Where these issues affect the systems, they may not be able to operate properly and default to a fail-safe position. While currently there are few connected generators whose output would be curtailed by resorting to a fail-safe position, this will become increasingly important as more generators connect and the changes to the regulatory environment from the implementation of the Access Significant Code Review (SCR) changes that apply from 1st April 2023 gives the DNOs financial incentives to ensure customers are not constrained unnecessarily.

Ensuring these systems operate effectively will require continued monitoring and responding to the alarm and event notifications. The experience with the SVO system to date has shown that understanding the conditions that caused the events is far from simple as the context of the events can be difficult to determine retrospectively from within the system itself.

The processing of these new alarms require a different approach and level of analysis to rationalise and resolve them. They require significant analysis to address and resolve which makes the management of the network more complex. As a result this can lead to a higher risk of error, reduced effectiveness and lower morale amongst control room engineers. The project goal was to develop a robust tool for the analysis of alarms and events so that by understanding the root causes and interactions, they can be managed efficiently and effectively.

The project was initiated to address the problem of growth in alarms by analysing the relationship(s) between alarms and other system events, including configuration changes and measurements.

The investigation considered how the alarms in the new ANM and SVO systems relate to the alarms within PowerOn or to each other. However, the approach taken and prototypes developed were generalised as far as possible so that it could be applied to future systems yet to be developed, or systems in use by other DNOs.

Similarly, while the relationships between some PowerOn alarms and other PowerOn alarms (e.g., where networks are nested) are not specifically excluded from the analysis, as these alarms are well established and their management is routine, this is not expected to be the key area of benefits. Also, the existing alarm and event management facilities within PowerOn already provide a number of features to simplify and prioritise the information provided to the control engineers and the project does not intend to duplicate these.

The project analysis aimed to create rules or information that can be used to either refine the alarm system to better sort and separate alarms or to help controllers improve decision making when controlling the network and alarm operations.

The project was delivered via the following work packages.

WP1. Specification

This involved gathering detailed business domain knowledge to ensure a solid understanding of the National Grid Electricity Distribution network region, business processes and availability of data.

Data was provided from;

- PowerOn, the control room system,
- ANM systems Inter Control-room Communications Protocol (ICCP) configuration

Scope (15,000 Characters Max) Ctrl + Z to count words in the selected cell.

- The SVO database and ICCP configuration
- Integrated Network Model (INM)
- CROWN (NGED Asset Register)
- HISTAN and TSDS (NGED Time Series Databases)
- NGED's Network Capacity Map (to provide a simplified network hierarchy)
- Electric Office (Network schematics)
- Weather data

The system specification outlining the functionality of the tool to be delivered was produced. The tool was required to be Python based and accessible via a browser interface from National Grid systems. The IT infrastructure required to support the project was agreed with NGED's IT team and this included discussions to agree COVID secure arrangements for server installation. The output of this Work Package was the Specification document which captured the data inputs and the functional requirements for the tool.

WP2. Design

This work package generated a design of the NEAT platform to meet the specification produced in WP1 which captured the algorithms to be used when analysing the alarm and SCADA information. This also involved a data quality assessment, data analysis and identification of advanced analytical techniques. This included checking the data is complete and whole, identification of outliers or other logical inconsistencies and ensuring that the joining of datasets does not lose information or incur further data issues. Where feasible, data quality problems were addressed. This involved reporting back issues to the data providers and correcting problems with the data extraction process but also investigating an unusual event that had hampered data extraction due to the volume of data that had been unexpectedly created.

During this stage it was also found that a data extract which was not expected to include any Personal Data as defined by GDPR did include some staff names and contact details. A new process was created to cleanse the data extracts before these were shared with Harmonic which involved risk evaluation and sign off from the legal team.

Preliminary insights and observations were made following an initial data assessment. Initial tests of the various model types informed preliminary selection for further development during the build phase. The design phase set out the overall process for the tool along with the user interaction and thoughts on the data analysis methodologies.

The Work Package produced two deliverables,

- WP2 - D1 - Data Quality Assessment Summary and
- WP2 – D2 – NEAT Design Document

WP3. Build

The advanced analytical techniques and dashboard development was completed during the Build work package. This built on the learning from the Exploratory Data Analysis (EDA) which included; clustering analysis, network association analysis and spatial analysis, time series analysis and predictive forecasts. The analytical techniques were integrated into the NEAT dashboard and also included the development of a data loading process to ingest data from the databases into the analytic tool. Once the design was agreed this was then used to produce a test book that could be used for user acceptance testing. This was reflected in the work package having the two deliverables below;

- WP3 - D1 - User Acceptance Testing Book
- WP3 - D2 - Build report

During this phase it became apparent that the data that was currently being provided from the ANM systems was very sparse. A new ANM zone was being commissioned during the project timescales that offered the opportunity of comparing what might be possible with additional data and so additional work was commissioned to increase the data flowing through the ICCP link. The deployment of this ANM zone was then delayed so that the additional data points were unavailable during the trial.

WP4. Deploy and Test

This Work Package included the work to deliver the NEAT dashboard within National Grid's IT infrastructure. This stage also involved ensuring that the scripts that load data from the databases into the analytic tool were formalised and available to run on a regular basis. At this stage the project suffered a sequence of events which all introduced incremental delays, which compounded to delay deployment and testing for several months. The most significant cause of the delays was the use of the new technologies CyberArk and OpenShift. CyberArk is a cybersecurity tool designed to ensure safe, secure access by third parties. National Grid is a target for cyber-attacks and requires the most stringent levels of protection. One protection measure is that most laptops are not able to connect to the internet which then made it harder to support deployment as screen sharing or other remote access options were not available. With new products there is inevitably a lack of experience to draw upon within the existing staff and therefore external expert support was required to ensure that the system was configured correctly. These external resources were not available at short notice. Similarly there were also issues with getting the OpenShift software to be configured correctly. These major issues were further confounded by other issues around staff availability due to resurgence of COVID and staff turnover. Resource availability was also adversely affected by an internal reorganisation which preceded further changes that resulted from the take-over of Western Power Distribution with National Grid. The merger itself required considerable support from IT resources which changed the prioritisation of previous planned work.

During the same period of time other changes in staff resulted in a re-evaluation of the process used to extract data. While data extraction had previously been carried out manually during the day, due to the size of some of the data extracts the normal means for automating the reports was not considered to be appropriate due to the potential for the report to fail and interrupt other vital overnight reports. This required a solution to vastly reduce the size of the automated reports so that the very largest files were managed manually. This change in process required changes to the data upload procedures.

Another significant change that occurred during the period that the system was being deployed was the decision to switch off the SVO system. The decision to turn off this system reflected the decision to recreate the SVO functionality within PowerOn in the future, which meant that the existing system had a limited life going forward. It also reflected the high licencing costs associated with the ongoing provision of the SVO system which were not deemed to provide value for money.

The User Acceptance Testing (UAT) was carried out in accordance with a UAT workbook which was prepared during the build phase. The UAT was passed with the proviso that some of the functions which could only be tested once a certain volume of events had occurred e.g. displaying more than one page of issues in a list.

This also raised an issue over the display of dates as to whether the better format would be YYYY – MM- DD or DD –MM-YYYY.

Scope (15,000 Characters Max) Ctrl + Z to count words in the selected cell.**WP5. System Trial and Findings Analysis**

After the UAT was successfully concluded, the System Trial was undertaken. The System Trial sought to gather experience of using the system with real data and real users. The UAT had already demonstrated that the system navigates between dashboards and event details correctly including filtering events and creating related graphics.

The purpose of the System Trial was to;

- Investigate the events that the system identifies.
- Confirm whether the system is supporting the functional requirements documented as expected. E.g. if root causes which have already been determined are correctly associated with similar subsequent events.
- Consider the requirements of a user supporting ANM and SVO systems and evaluate whether improvements could be made to the design of the system

The System Trial took place over a three month period from the end of November 2022 to the end of February 2023 with integrated review cycles to allow, where possible, tweaks to the system to be deployed to reflect learning that was captured early.

During the System Trial the Trial Log was updated whenever the system was assessed. This assessment was undertaken by the NEAT project manager from NGED. Cybersecurity limited access to the system to NGED and Harmonic therefore no testing could be carried out by PSC.

Routine assessment of the events was complemented by User Reviews by other members of staff within NGED. Unfortunately no member of staff has a role that is exactly equivalent to the foreseen role of the NEAT user. However, these user reviews brought additional perspectives from those who:

- Currently design and deploy ANM systems.
- Are involved in innovation projects.
- Are involved in supporting our existing control system.

To widen the range of feedback a number of usability assessment sessions were undertaken with relevant staff to capture their view of the functions and visualisations in the tool and to suggest improvements. These culminated with a short usability questionnaire.

The System Trial was amended to include the provision of historic data so that the events on the SVO system could be viewed using the NEAT prototype.

The learnings from the System Trial were captured in a findings report and the key points have been summarised in section 9.

WP6. Dissemination and Closedown Report

This findings from the trial were disseminated via a webinar in April 2023 which was attended by staff from other DNOs, engineering consultants, ANM system providers etc. The webinar slides are available on the NEAT website.

Objective (15,000 Characters Max)

The objectives for NEAT are as follows;

- Understand the data that can be used to provide context for the alarm and event analysis
- Assess the quality of this data and where possible correct quality issues
- Derive preliminary insights from the data to inform the selection of models
- Carry out advanced analytics to understand the relationships between alarms and events in different systems and the external datasets
- Create a prototype dashboard to allow the analysis to be run regularly and present the user with results
- Trial the use of the dashboard using real data over a period of time
- Consolidate and share the learning from the project

Success Criteria (15,000 Characters Max)

The success criteria for NEAT are as follows;

- The project has gained an understanding of the new types of alarms and events associated with new systems supporting DSO functions, how these differ from "traditional" control system alarms and how the needs for their management differ to traditional alarms and events.
- The data sources that are available to contextualise these alarms has been explored and relationships between data items and the alarms and events have been found.
- The learning gained from analysing relationships between alarms and events and the contextualising data has been incorporated into a dashboard which is suitably generic in design to anticipate future systems to support DSO functions that are not yet known.
- A dashboard to assist with the management of these alarms and events has been developed and tested. Learning from the trial has been used to recommend changes to datasets, processes, systems etc. to reduce alarms and events in the future and/or the way in which alarms and events are managed has been improved to reduce the time spent on their management.

Step 2 - Performance Outcomes

Performance Compared to Original Project Aims

Details of how the Project is investigating/solving the issue described in the NIA Project Registration Pro-forma. Details of how the Project is performing/performed relative to its aims, objectives and success criteria. (15,000 Characters max)

The NEAT project has completed all its objectives as detailed below.

- Understand the data that can be used to provide context for the alarm and event analysis
 - **Complete** - This was completed and documented in the early exploratory data analysis work and then later in the document WP2 - D1 - Data Quality Assessment Summary.
- Assess the quality of this data and where possible correct quality issues
 - **Complete** - This was achieved with the deliverable WP2 - D1 - Data Quality Assessment Summary. This did find data quality issues which were corrected that related to the way data was being extracted from PowerOn.
- Derive preliminary insights from the data to inform the selection of models
 - **Complete** - This was documented in the Exploratory Data Analysis work and discussed at the routine project meetings to determine if business knowledge was consistent with the findings.
- Carry out advanced analytics to understand the relationships between alarms and events in different systems and the external datasets
 - **Complete** - This work built on the Exploratory Data Analysis and refined it further. The resulting methods were included in WP2 - D2 - Design Report.
- Create a prototype dashboard to allow the analysis to be run regularly and present the user with results
 - **Complete** - This was completed to help provide user feedback as part of the work to create WP2 - D2 - Design Report.
- Trial the use of the dashboard using real data over a period of time
 - **Complete** - The trial tested the system for 12 weeks and included usability assessments from key members of staff.
- Consolidate and share the learning from the project
 - **Complete** - The NEAT learning was shared via a webinar in month and also via the publication of the webinar slides, webinar recording and this closedown report.

The project has also met all its success criteria as detailed below.

- The project has gained an understanding of the new types of alarms and events associated with new systems supporting DSO functions, how these differ from “traditional” control system alarms and how the needs for their management differ to traditional alarms and events
 - **Achieved** - The NEAT system has filtered out the normal network management related alarms and events so that those relating to the ANM, SVO and Telecoms systems can be more clearly seen by support staff. While initially limited information was available from the ANM systems this was increased by an amendment to the ZIV system in Cornwall to pass more data via the ICCP to PowerOn so that this could be picked up by the alarm and event management process.
- The data sources that are available to contextualise these alarms has been explored and relationships between data items and the alarms and events have been found.
 - **Achieved** - The LAEP method document has been used to assist designing the process and to suggest sensitivity analysis requirements. Since then the learning and experience from EPIC has been fed into the various workshops held by Energy Systems Catapult looking at Local Area Energy Planning. Comparison to the outputs of that process show a very similar process to EPIC with similar stages for allocating roles, determining the required data, carrying out analysis etc.
- The learning gained from analysing relationships between alarms and events and the contextualising data has been incorporated into a dashboard which is suitably generic in design to anticipate future systems to support DSO functions that are not yet known.
 - **Achieved** - This was achieved during the work packages for design and build. The prototype system tested would be easy to adapt for additional systems as the general ideas of being able to track events over time or by category would be the same as would be the process to manage and investigate the events. The process to analyse existing data to determine thresholds for unusual activity could also be repeated.
- A dashboard to assist with the management of these alarms and events has been developed and tested. Learning from the trial has been used to recommend changes to datasets, processes, systems etc. to reduce alarms and events in the future and/or the way in which alarms and events are managed has been improved to reduce the time spent on their management.
 - **Achieved** - This was achieved during several of the project phases. The build, deployment, test and trial phases allowed the trial to take place and the learning to be captured. The learning from the project has been fed back to owners of the data where this was found to contain errors or to be extracted in an unsuitable format. The ability to provide useful learning from the trial that would reduce future events was hampered by the switch off of the SVO system which provided the majority of the events for NEAT to manage. However, events relating to the ANM system have been fed back for further investigation and management.

Required Modifications to the Planned Project Approach

The Network Licensee should state any changes to its planned methodology and describe why the planned approach proved to be inappropriate. Please confirm if no changes were required. (15,000 Characters max)

Additional work to anonymise data for GDPR compliance

During the design stage it became apparent that a data extract which was not expected to include any Personal Data as defined by GDPR did include some staff names and contact details. This required a new process to be developed to anonymise this data before it was sent to Harmonic to ensure GDPR compliance. This involved creating a cleansing database through which data extracts were processed. This also involved a risk evaluation process with the legal team.

Revised approach to SVO trial

During the project the SVO system, which was expected to be a major source of events for investigation, was switched off. This reflected a review of the plan for future system development that included incorporating the current SVO functionality within PowerOn. This brings a large advantage in reducing the workload associated with managing two separate network models and by having a single network model there is no need to replicate the switching operations from PowerOn onto the remote model. This reduces one of the likely triggers for errors on the SVO system. Having made this decision, maintaining the existing SVO system became uneconomic due to the significant licencing costs. This meant that by the time of the trial the SVO system was no longer available to send event data for analysis. Historical SVO data was investigated to determine if this could be fed into the NEAT system to see how it would be processed. While full SVO data could not be included, the issues identified during the NEAT development while SVO was running were replayed 2 years after they originally occurred during the trial. This ensured that SVO data and risk factors were present during the trial.

ICCP data extension ANM system deployment

During the Exploratory Data Analysis phase of the project it became apparent that while the ANM systems from both vendors, SGS and ZIV, exchanged data with PowerOn in order to function correctly the data exchanges were limited to the minimum dataset required. While there was some internal logging of events within the systems to support troubleshooting by the developers, they were not designed to be interrogated remotely or to provide routine reports. The Cornwall ANM system that was provided by ZIV was updated during the project to include additional items that were passed through the ICCP link and used to provide alarms within PowerOn that could then be added to the normal alarm reporting data extracts.

Delay to Trial system deployment

There were a number of delays to the deployment of the trial system. This resulted in the project timescales being extended.

Change to data provision from PowerOn

The provision of data from PowerOn during the early stages of the project was on an ad hoc basis. While some of the reports took a long time to run they were supervised by the person extracting the data and would not interrupt other business processes if they failed to perform correctly. However, in preparation for the deployment of the NEAT system some of these data extracts needed to be automated to run daily or weekly. This automated process was evaluated to be high risk.

Lessons Learnt for Future Projects

Describe how the project (methodology, stakeholder engagement etc.) changed, or provided opportunities, from your expectation at the start of the project and therefore could be useful for a future project. In addition, please discuss the effectiveness of the research development or demonstration undertaken. (15,000 Characters max)

Data Quality and Availability

- **Data Quality issues** - Some of the data quality issues did not reflect issues with the underlying data sources but were introduced during the process of data extraction. This included the incorrect use of field delimiters which resulted in some data being reported in the wrong columns after a certain record in the data extract.
- **Prohibitive data volumes** - There was a very large alarm flood in November 2020 with millions of records added in a single day. This prevented the normal system for reporting from working as it could not manage the volume of alarms. These were eventually identified as relating to a particular device, a Panacea PMAR which when connected via a DNP3.0 comms link to the host RTU, will exhibit an abnormal behaviour as the device is unable to recognise the acknowledgement of the alarm being sent back from the host RTU to the device.
- **12h and 24h time formats** - These were often mixed within the same report. Sometimes the use of 12h time without an am/pm indicator made it impossible to tell the time of the event.
- **TSDS vs HISTAN data** - While some initial analog value data was available from TSDS, it was decided to switch to the HISTAN system for the regular data extract of that data as it was more suited to the regular data extraction.
- **GDPR compliance** - While none of the fields titles for the extracted data suggested personal information, there were items of personal data entered within comment text fields which needed to be located using standard text items as search terms. While not strictly necessary, additional anonymization was undertaken to remove the names of field staff who were despatched to faults or control staff that confirmed alarms.
- **ANM data availability** - The data available for the Exploratory Data Analysis and the System Trial was less than expected reflecting both the delay in commissioning the Devon ANM, and the low levels of customer constraint during the winter months.
- **SVO data availability** - The switch off of the SVO system during the project made it impossible to trial that element of the system in real time. It was, however, possible to adapt the system to handle historic data and replay it in real time. It was not known originally whether the changes in the rest of the network data in PowerOn would enable this but it appears that a sufficient majority of assets were unchanged to enable the data processing to work.
- **Network Model Update – built in validation** - Wellington electricity will be using electric office to create PowerOn patches; this could provide a model for future development by NGED as a means to reduce the issues around network model update that can cause problems with the state estimation modules of ANM and SVO.

Specification & Design

- **Filtering alarms** - The data includes large amounts of irrelevant items such as bund pump alarms and radio alarms, excluding these allowed for more focussed analysis
- **Alarm data content** - Some items do not have an electrical location but still might contain useful information. There is a difficulty associating these with other alarms
- **PowerOn Patches** - It is not possible to easily determine the assets associated with a patch in PowerOn and hence whether a particular network amendment would be a likely cause for subsequent failures on the ANM or SVO systems.

Deployment & Test

- **VPN** - Unexpected VPN incompatibility issues resulted in delays while an alternative end point on Harmonic's side was set up.
- **Blind deployment** - There was significant latency in some steps of the deployment while approaches were found and staff were unavailable to do some of the steps that Harmonic/PSC don't have access to do.
- **CyberArk** - Using a Firefox browser was thought to be the reason behind a user getting stuck in a loop when trying to log in to CyberArk. WPD only has Chrome and Edge as supported browsers. This did not turn out to be the problem but the link provided was different to that used by WPD IR, it was missing "/V10" in the middle of the link.
- **OpenShift** - OpenShift was deployed during the development phase of the project and was supposed to be ready for the deployment, but a number of unexpected issues delayed the availability of the platform and therefore the deployment of NEAT.
- **Security processes** - Multi factor authorisation failed to work the first time for one user because their phone was set to a time that was more than 6 minutes off from the correct time.
- **Security processes** - Using the WebEx to change passwords, the normal process to change initial passwords for security, was very complex with remote third parties. Having a separate zoom meeting to be able to talk to each other during the process was very helpful.
- **Testing data volume** - Due to the low number of events due to the time of year and well-behaved systems, there was little current data to test with. It was not possible to import historic data because it was not kept in the expected format.
- **Nested IT Issues** - Until the VPN issue was fixed we could not detect the CyberArk issue, until the CyberArk issue was fixed we could not detect the OpenShift issue. There is little opportunity for parallel work to resolve issues due to the serial way in which they are detected.

Trial

- **Lack of a representative user** - The majority of the trial investigation was carried out by the project manager as there was no-one in the role of the system user that could be called upon.
- **Event investigation** - Without other references it was difficult to evaluate whether the information provided was sufficient to evaluate determine the root cause of the event.
- **Word Cloud** - The word cloud did not work well for events that were triggered by multiple instances of the same alarm as there was no additional text items to include.
- **11/12 minutes past the hour** - Incorrect date format in the export process caused alarms, switching events, and issues to have dates all 11 or 12 minutes past the hour until identified in NEAT. Data had not been used in this level of detail before.

Lessons Learnt for Future Projects

Describe how the project (methodology, stakeholder engagement etc.) changed, or provided opportunities, from your expectation at the start of the project and therefore could be useful for a future project. In addition, please discuss the effectiveness of the research development or demonstration undertaken. (15,000 Characters max)

- **Issue drill down** - None of the issues that were examined could easily be related to work that had been identified as happening via the CROWN data. It is expected that this would be easier with a geographical visualisation of the CROWN events.
- **Trial Timing** - The delays to the project resulted in the trials being held during the winter, when the chances of ANM operation to curtail generation were low. Given that it was possible to replay the SVO data it could have been possible to replay ANM data from the summer, however, it is believed that additional effort would be better spent testing a different licence area.
- **Event categories** - PowerOn alarms were the most prevalent with ANM alarms being second and SVO third.
- **Event types** - The Volume alarms e.g. a high number of stage 2 alarms being received in a 24 hour period, were the most frequently
- **Event locations** - Three locations were responsible for nearly 75% of all the events identified suggesting that targeted remedial work would be very effective in bringing down event volumes
- **Overall alarm volumes** - Overall alarm volumes were lower than expected suggesting that even with the additional focus on ANM systems following Access SCR changes, that this would not warrant data imports at a higher frequency than once a day.

Project process

- **Assumed levels of support from National Grid IT** - The learning from previous projects had been applied in that there were 1) No interfaces to National Grid systems, 2) Very early engagement with the IT staff, including the cyber team, to flag up future requirements for support. It was expected that would be sufficient to allow for smooth installation, but the introduction of new systems, impact of Covid, and the change in IT priorities during the corporate merger were highly unusual. This demonstrates the value in having projects that can extend their timescales and confirms the need for a moderate level of financial contingency for projects.
- **Lack of a representative user** - This was problematic throughout the various stages of the project and suggests that the project may have been undertaken too early in the process of determining the strategy for the DSO support systems.
- **Working across time boundaries** - There were several instances where time was lost due to the time difference between the UK and New Zealand.

Outcomes of the Project

When available, comprehensive details of the Project's outcomes are to be reported. Where quantitative data is available to describe these outcomes it should be included in the report. Wherever possible, the performance improvement attributable to the Project should be described. If the TRL of the Method has changed as a result of the Project this should be reported. The Network Licensee should highlight any opportunities for future Projects to develop learning further. (15,000 Characters max)

The outcomes of the project are as follows;

- A better understanding has been gained of the data within our PowerOn system, including the degree to which multiple alarms are created in the background of PowerOn which users are not aware of.
- We have developed greater awareness of where Personal Data is unexpectedly contained within datasets and how this data can be cleansed in order to allow it to be shared.
- We have gained an understanding of the rate of alarms and events experienced by the DSO support systems, their categories and their relative prevalence.
- A trial system has been developed and tested which can be modified for use with another licence area within NGED or a DNO that is not part of the NGED group.
- A view of what visualisations are helpful to a user trying to understand the correlations between events and alarms from different systems has been gained from the user reviews of the system.
- The learning from NEAT to date has been fed into the workshops held by Energy Systems Catapult in February 2022 in relation to Local Area Energy Planning.

Step 3 - Outputs And Implementation

Data Access Level

A description of how any network or consumption data (anonymised where necessary) gathered in the course of the Project can be requested by interested parties. Please include a link to the publicly available data policy. (15,000 Characters max)

No new data was collected as part of this project but rather data extracts were taken from existing systems. Requests relating to the data used in this project should be addressed to the innovation team as the inclusion of Personal Data within alarm information makes it unsuitable for publishing on our website.

Following the changes in NGEDs strategy that will result in SVO and ANM systems ultimately being recreated within PowerOn, and the switch off the SVO system, the business case for full BAU roll out has diminished. However, there is potential benefit in supporting the telecoms teams by making the events more visible to them and therefore it is recommended that further work is carried out to test the NEAT system but in a licence area, that has more frequent telecoms issues than the South West. Keeping the system running to observe the impact of the additional ANM data points is also a low cost option.

Foreground IPR

A description of any foreground IPR that have been developed by the project and how this will be owned. (15,000 Characters max)

The algorithms produced for the analysis of the alarms were shared in the Design and Build documents published on the National Grid website. The source code for the NEAT trial system is available on request.

Planned Implementation

Please describe the next steps to implement this innovation project. What policies and standards need to be updated or created as part of this implementation. (15000 Characters max)

Following the changes in NGEDs strategy that will result in SVO and ANM systems ultimately being recreated within PowerOn, and the switch off of the SVO system, the business case for full BAU roll out has diminished. However, there is potential benefit in supporting the telecoms teams by making the events more visible to them and therefore it is recommended that further work is carried out to test the NEAT system but in a licence area that has more frequent telecoms issues than the South West. Keeping the system running to observe the impact of the additional ANM data points is also a low cost option.

Other Comments

Standards Documents

Identify any industry standards that may require updating due to the outcomes or understanding developed from this innovation project. If no standards will need to be updated, please state - not applicable