

# Network Event and Transparency (NEAT)



Client: WPD

Location, Year: UK, 2020

## OVERVIEW

Western Power Distribution (WPD) in the United Kingdom has engaged PSC to deliver an innovation project known as the Network Event and Alarm Transparency (NEAT). The project is being run by WPD and funded under the Ofgem Network Innovation Allowance (NIA).

## CHALLENGE

Distribution Network Operators (DNOs) are experiencing an increasing number of new and unfamiliar types of alarms in their control rooms as new functions for real-time dynamic network management and optimization schemes are introduced. These functions are required to support Active Network Management (ANM) or System Voltage Optimisation (SVO) and are expected to be followed by other new systems and functions as part of the Distribution System Operator DSO transition. The processing of these requires a different approach and level of analysis to rationalise and resolve them. These new alarms require significant analysis to address and resolve them. It also makes the management of the network more complex. The project's goal is to develop a robust tool for analysing alarms and events so that by understanding the root causes and interactions, they can be managed efficiently and effectively.

## PROJECT SOLUTION

In partnership with Harmonic Analytics<sup>1</sup>, PSC will address the issues by developing a software tool that will be analysing the relationship(s) between alarms and other system events<sup>2</sup> to provide clear conclusions on the root of the various issues raised by the alarms.

The project approach contains seven distinct work packages:

- ▶ **Develop a Specification:** Production of a system specification outlining the tool's functionality to be delivered and accessible via a browser interface from the WPD systems.
- ▶ **Design Phase:** The models and datasets to be used in delivering the functionality outlined in the specification will be determined in this phase. This will include an assessment of the available data to assess whether it is complete and whole. Initial tests of the various model types will inform preliminary selection for further development during the build phase. The design phase will set out the tool's overall process along with the user interaction and thoughts on the data analysis methodologies.
- ▶ **Build Phase:** The build phase will develop the software tools that will include sprints (focused productivity technique created by a group of individuals working on the same software development) for model refinement and the creation of a dashboard for user evaluation. The build phase will use clustering analysis, network association analysis, spatial analysis where geographical information is present, time series analysis, and predictive forecasts.

<sup>1</sup> [Harmonic Analytics](#) are a leading data science company based in New Zealand.

<sup>2</sup> System events relate to system assets, configuration and measurements available from the WPD SCADA system.



- ▶ **Deploy and Test Phase:** This phase will carry out the selection and integration of the project into the NEAT dashboard.
- ▶ **System Trial and Findings Analysis Phase:** The prototype dashboard will undergo further development during a live system trial to extract insights from the alarm and event analysis. During the trial period, analysis will be carried out to review trends and look for results improvement and learnings.
- ▶ **Dissemination and Project Closedown Phase:** This will cover the findings in terms of alarm relationships as well as trends from the ANM and SVO alarm systems. This phase will highlight the benefits and improvements possible through a better understanding of the interactions between different events.

## PSC ADVANTAGE

Our global footprint enables PSC to bring extensive experience working on innovative new schemes to facilitate the connection of low carbon technologies to the power system and support the transition to net-zero. The PSC UK team has extensive experience working across all DNOs and supporting the transition to operating more active networks as they transition to become Distribution System Operators. PSC also has an established partnership with Harmonic Analytics who bring leading data analysis experience relating to alarm and event management from Australia and New Zealand to ensure maximum benefit for WPD and the UK industry.

“Distribution Network Operators are taking on new roles to become Distribution System Operators. These new roles often require new software systems to support them which increases the number of alarms but also introduces new types of alarms that can be difficult to manage. NEAT will help us streamline the process to resolve these new alarms ensuring the optimal operation of our network.”

The project has been welcomed by  
Jenny Woodruff, Innovation and Low Carbon Network Engineer at WPD.