GPA PQ Dashboard User's Group Meeting

PQDashboard

Hosted by:

Electric Power Research Institute

- Program 1: Power Quality
  - Project Set B: PQ Monitoring, Data, & Analytics

Host:

Tom Cooke, EPRI

21 April 2022

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Power Quality
PS1B: PQ Data & Analytics

AGENDA

- 1:00 – Introductions & Overview
- 1:05 – EPRI Review
- 1:15 – User Updates
  - HECO
  - GTC
  - TVA
- 3:15 – Break
- 3:20 – GPA Updates
- 4:15 – Roundtable and Open Discussions
- 5:00 - Adjourn

"There's no one of us as smart as all of us together. We value your feedback."

tcooke@epri.com

Welcome and Introductions

Chat Sign-in: *Name, Affiliation, Email*

Chat Guidance

#Chat: #<topic> to start a new thread

#Chat: #<previous topic> to respond to an existing thread

#Chat: #<previous topic> @<name> to respond to a specific person's post

#Chat: Enter "Q:" at the beginning of a question for the current speaker

#PQData: Before smart meters, I believe PQ data sets were usually the longest-running and largest at most utilities. So, we were "Big Data" before that was cool.

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Welcome & Introductions

- Alabama Power
- American Electric Power
- Baltimore Gas & Electric
- Dominion Energy
- Dominion Energy SC
- Duke Energy
- EPRI
- First Energy
- Georgia Power
- Georgia Transmission
- Grid Protection Alliance
- Hawaiian Electric
- Knoxville Utilities Board
- Life Scale Analytics
- Middle TN Electric
- Mississippi Power Co.
- Ohio Power Co.
- Powerco Ltd
- Salt River Project
- San Diego Gas & Electric
- Southern Company Services
- Tennessee Valley Authority

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AGENDA

- 1:00 – Introductions, Agenda Review, and EPRI Review
- 1:15 – User Updates (40 minutes each)
  - HECO – Grid Mod Project Dashboard Contributions
  - GTC – Recent updates
  - TVA – Recent updates
- 3:15 – 5 Minute Break
- 3:20 – GPA Updates
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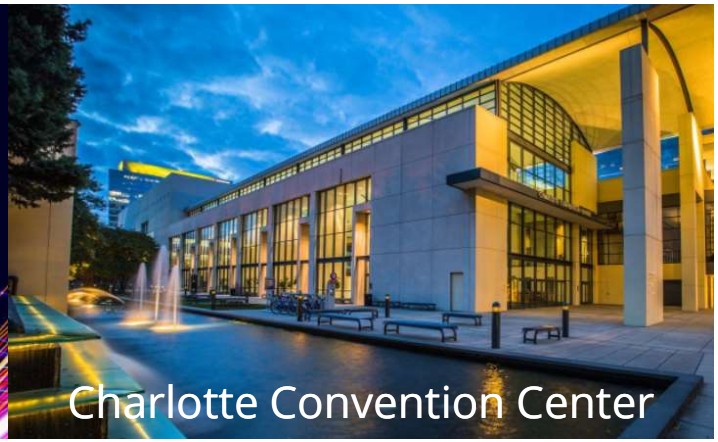
PQ Workshop @ Electrification 2022



https://www.electrification2022.com/

- **Power Quality Training for Utility Staff and Facility Operators**
- This two-part workshop will train attendees in the real-world investigation, assessment and monitoring of power quality issue that may impact industrial and other facilities.
  - Morning – **Power Quality Investigator**. This session will review the latest capabilities of the PQI, discuss the use cases from field investigation, and preview upcoming features. The workshop will be beneficial to anyone who might conduct Power Quality assessments for their industrial customer base.
  - Afternoon - **Open PQ Dashboard Workshop**. This session will go through a typical process of setting up, configuring, and using the power quality (PQ) suite of open-source software products utilized by EPRI members. This workshop will be beneficial to anyone increasing their PQ monitoring fleet and need more efficient methods to manage and analyze PQ data.

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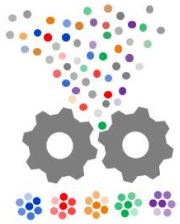
Proposed: 2022 PS1B Projects

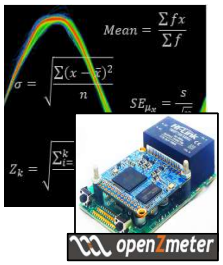


P001.004: AI Waveform Clustering Tool

- **Objective:** Group similar waveform events to aid in PQ event analysis.
- **Description:** Develop a software tool that uses machine learning clustering methods to categorize similar waveform events.
- **Deliverable(s):** PQAI-Alpha (Software)

P001.005: Common Information Model (CIM) for PQ

- **Objective:** Create the ability for PQ systems to efficiently integrate into other utility systems without creating translators and/or mappings.
- **Description:** Assess and recommend a CIM for power quality systems.
- **Deliverable(s):** Guide and Assessment of CIM for PQ (Tech-Report)



P001.006: Analysis of Fulltime Waveform Field Data

- **Objective:** Assess value and methods of measuring sub threshold waveform variants, for increased incipient fault detection
- **Description:** Assess data collected from field deployments of the open PQ monitoring system (oZm) with the new cyclic histogram and jolt algorithm for incipient fault detection.
- **Deliverable(s):** (Tech-Report) Value and Methods of Continuous Waveform Capture for Improving PQ Measurements

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"TrenDAP provides processing tools for analyzing power quality trend data"

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TrenDAP

open-source trending-data analytics platform

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"TrenDAP provides processing tools for analyzing power quality trend data"

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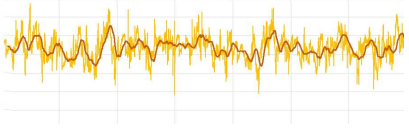
TrenDAP

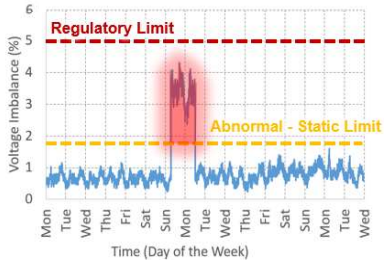
open-source trending-data analytics platform

- An open-source software component as part of the Open PQ Dashboard suite of products.
- Design requirements from collaborative utility funders and EPRI
- Developed by Grid Protection Alliance
- Objective of the tool is to integrate, analyze, and report trend data from a multitude of PQ and other data parameters to enable quick and informed decision-making.
- Flexible and Extensible Design: Customizable workspace with various analytical widgets.
- For more information:
  - EPRI PM: Tom Cooke, tcooke@epri.com
  - TVA PM: Tony Murphy, ammurphy@tva.gov

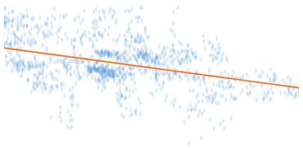
Plotting and Aggregation



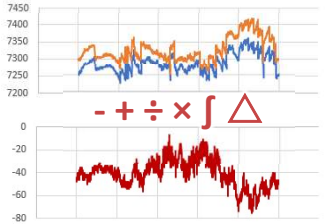
Statistical Process Control



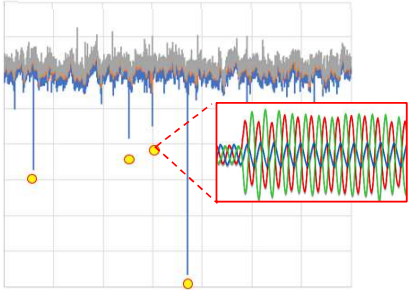
Correlation Analysis



Common Math Functions



Link to Fault Events



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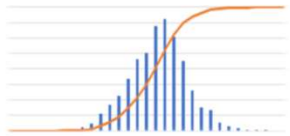

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PQ Dashboard Suite of Products

Supplemental Participants

- Dominion-SC
- Duke Energy
- Georgia Transmission
- Salt River Project
- Southern Company
- Tennessee Valley Authority

PQD
openXDA
openSEE System Event Explorer
openMIC METER INFORMATION COLLECTOR
TrenDAP open-source trending-data analytics platform

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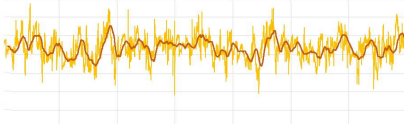

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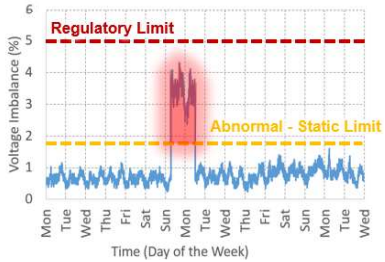

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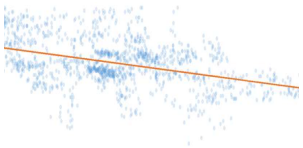

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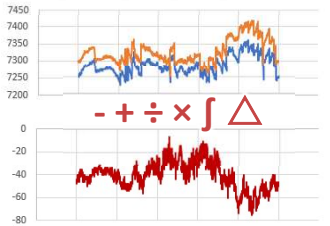

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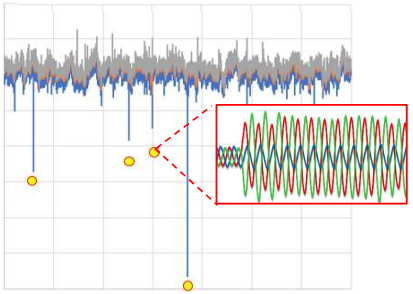

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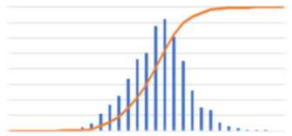

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TrenDAP Workflow

TrenDAP

- Define Data Sources
  - TrenDAP database for interval data
  - Other sources for trending data
    - OpenHistorian for Phasor Data
    - Saphire API for Saphire Data
- Establish Data Sets
  - Can use an existing one – or create a new one
  - Can include one or more data sources
  - For a specific time-range of interest and for a specific collection of values from each data source
- Chart / Display Data in Widgets in a Workspace
  - Can create multiple workspaces per data set
  - Multiple display widgets are currently available
  - Support for Templating of Workspaces for different meters has been added

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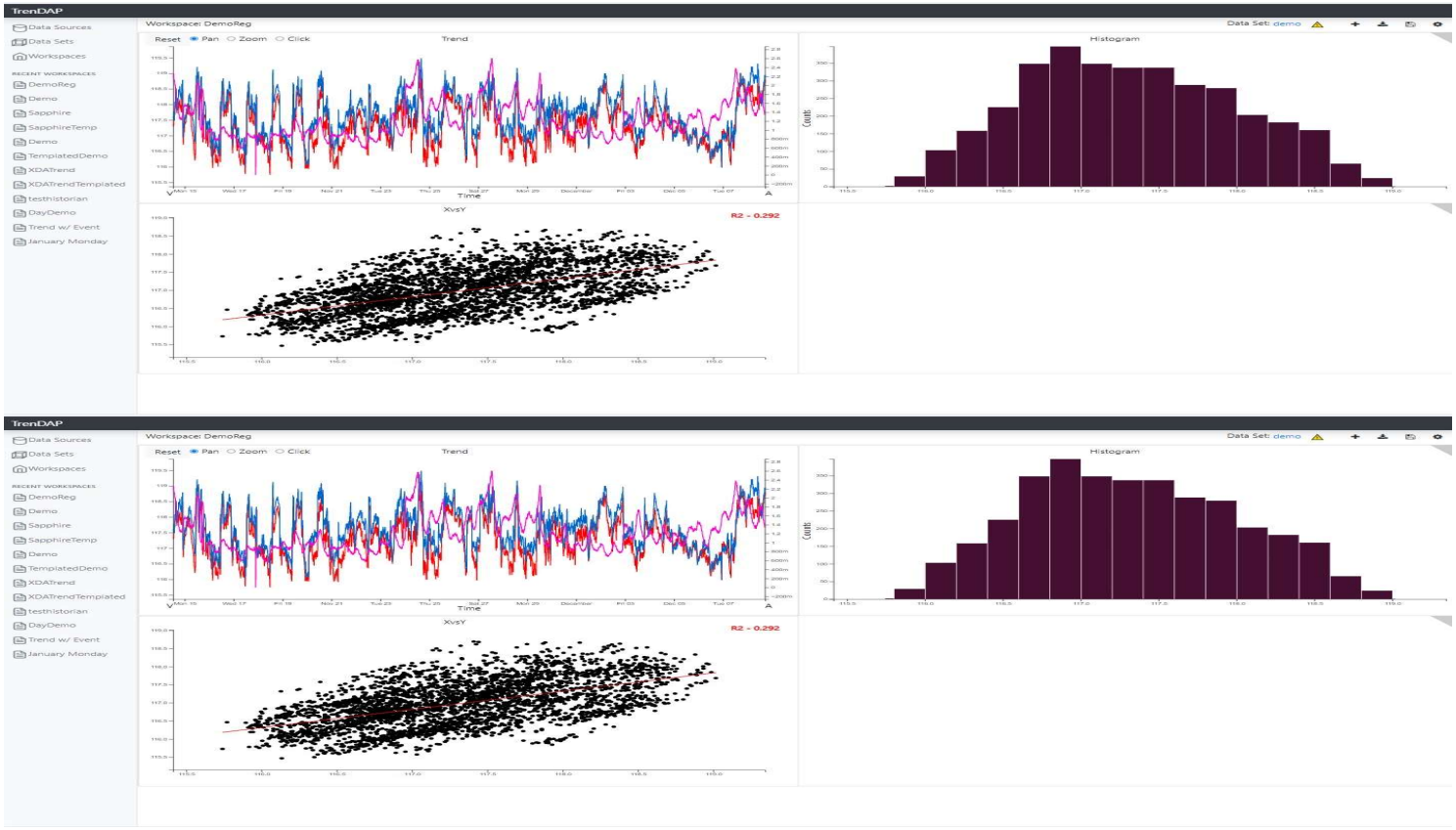
The Main Display

TrenDAP



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TrenDAP: Statistical Analysis

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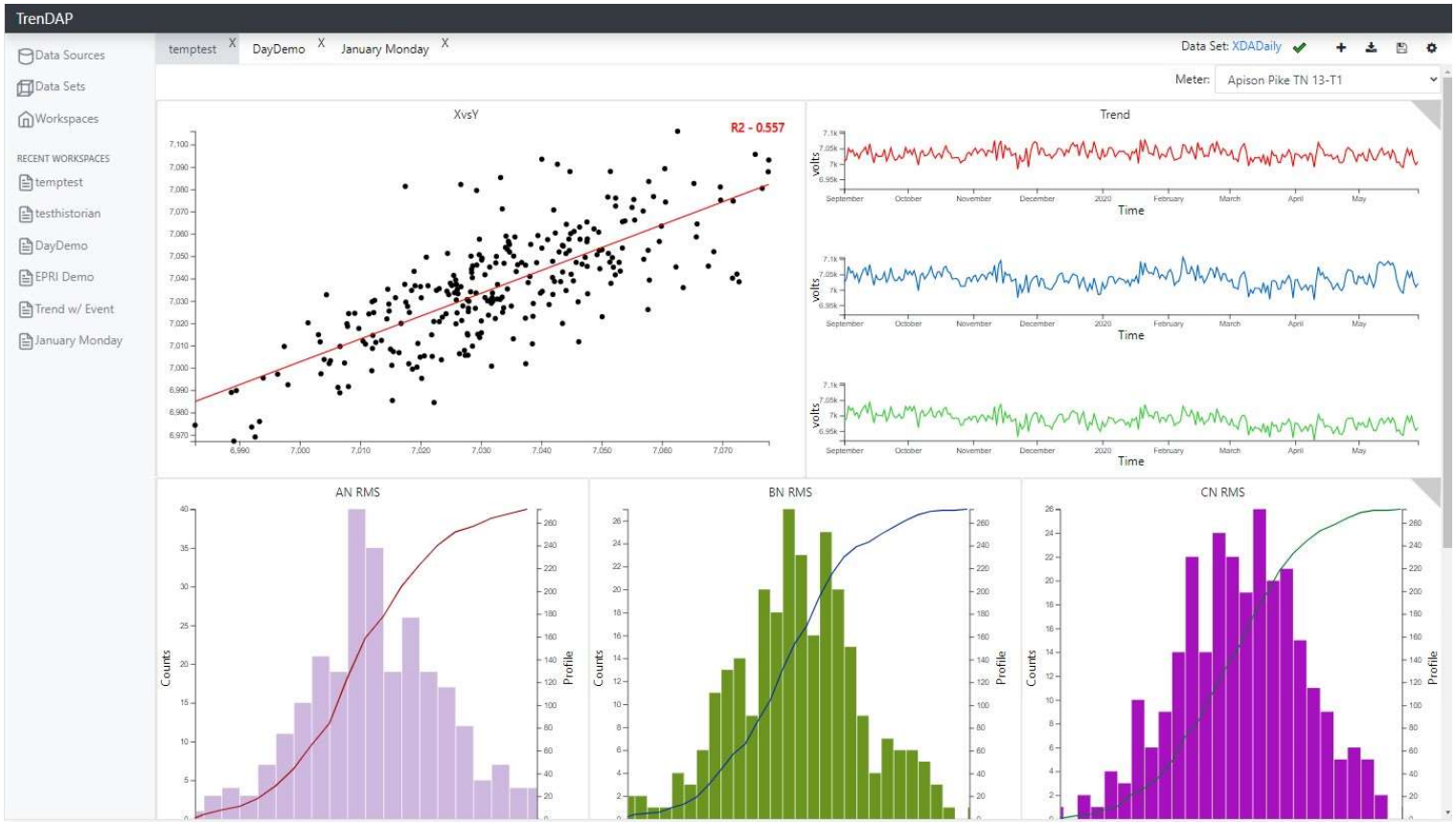

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User Updates

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Roundtable and Open Discussions

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