

# Overview



## Power Quality Dashboard

August 2014

# Dashboard vs Analytic Software

“ Dashboard reporting is the process of designing an easy to read, often single page, real-time user interface, showing a graphical presentation of the current status (snapshot) and historical trends of an organization’s Key Performance Indicators (KPIs) to enable instantaneous and informed decisions to be made at a glance.

<http://www.exceldashboardwidgets.com/>

**Analytics** is the discovery and communication of meaningful patterns in data. Especially valuable in areas rich with recorded information, analytics relies on the simultaneous application of statistics, computer programming and operations research to quantify performance. Analytics often favors data visualization to communicate insight.

(wikipedia)

# Dashboard vs. Analytic Software

## Dashboard

- Easy to read
- Single page
- Graphical
- Current status
- Historical trends of key performance indicators
- Informed decisions can be made at a glance

## Analytic Software

- Desktop or heavy client
- Manual steps
- Graphical or tabular
- Historical investigation
- Historical trends and details of specific events
- Typically used to gather reporting information

# Unique Values of a Dashboard

- View entire fleet instantly
- Primarily visual presentation
- Saves time compared manual tools
- Identify negative trends and take action
- Measure efficiencies/inefficiencies
- Present consistent view of information
- Make informed decisions based on specified populations
- Quickly identify data outliers

# PQ Dashboard Beta

## Background

- PQ monitoring goals considered:
  - Quickly assimilate large quantities of data
  - Effectively represent a large number of sites
  - Integrate PQ and GIS data
  - Provide value from a broad context
  - Provide actionable information

# PQ Dashboard Beta

## Background

- Challenges:
  - Increasing number of monitors
  - Large data volumes
  - Ineffective data distillation
  - Bad data

# PQ Dashboard Beta

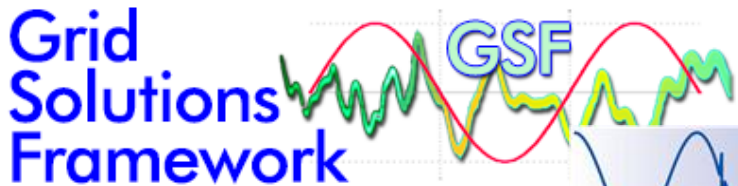
## Background

- Objectives
  - An OSS application
  - Develop OpenPQ Dashboard framework
  - Implement key features as a proof-of-concept
  - Demonstrate the value of a PQ Dashboard
  - Easily deployable
  - Easy integration with legacy systems
  - Extensible

# PQ Dashboard Beta

## Building on Prior OSS Work

- Grid Solutions Framework (GSF) library
  - Approximately half a million lines of code
  - Highly optimized data management functions
- 2102 EPRI open fault location engine (openFLE)
- 2013 open extensible disturbance analytics (openXDA)



open Fault Location Engine

<http://GSF.codeplex.com/>  
<http://epriopenfle.codeplex.com/>  
<http://openxda.codeplex.com/>



*open***XDA**  
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# PQ Dashboard Beta

## Context

- Initial displays have daily context
- Map and grid display entire fleet
- Default displays show yesterday's data
- 30 day summary chart
- Limited drill-down for some detail

# PQ Dashboard Beta

## Where we are now

- TVA Test data positioned for events and simple trending
- Visualization framework complete
- Displays complete:
  - Map
  - Events
  - simple trends

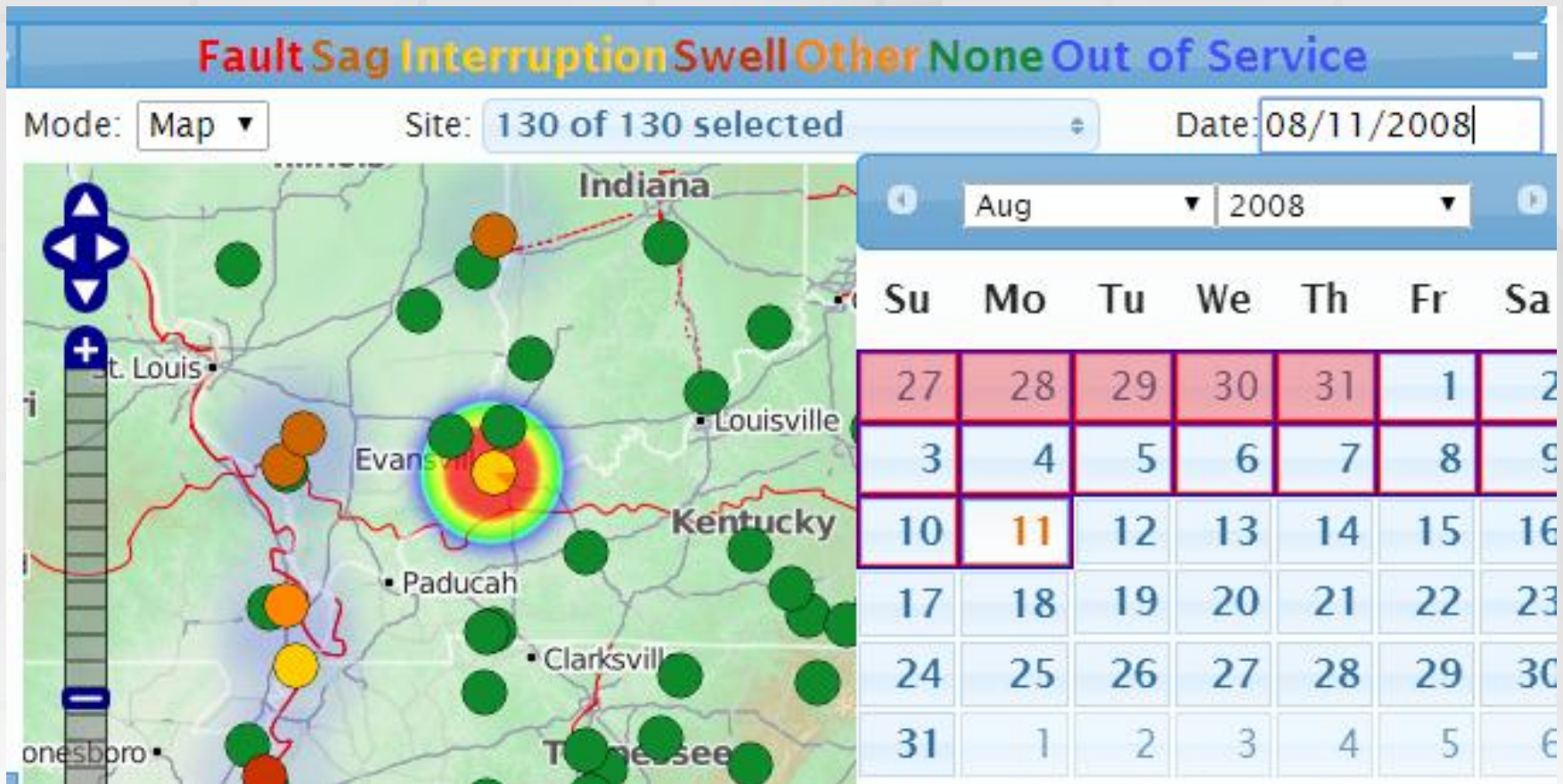
# PQ Dashboard Beta

## Additional planned functions

- Complex trend displays
- Compatibility curves
- Data quality displays
- Automatic Link to PQWeb for analytic detail

# PQ Dashboard Beta

## Simple Interface with Powerful Controls

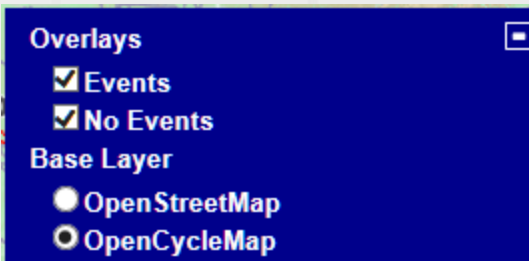


# PQ Dashboard Beta

## Simple Interface with Powerful Controls

- Intelligent calendar control shows day selected and identifies days with events

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

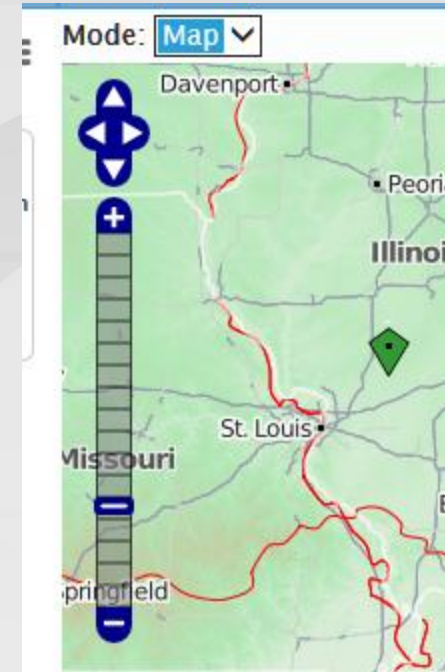
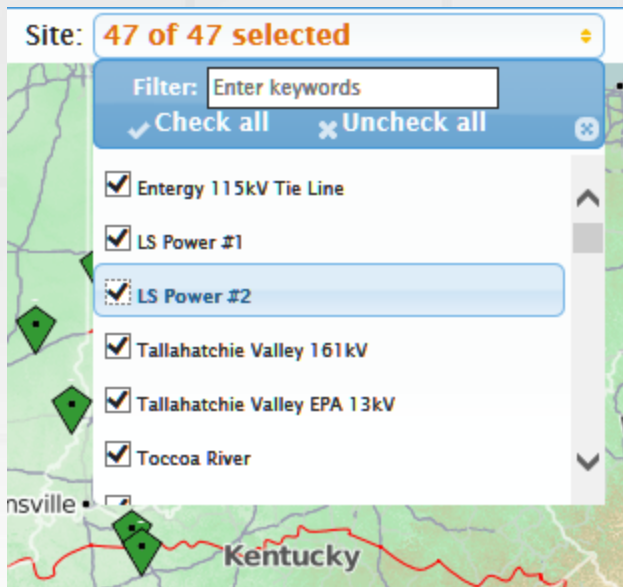


- Select base map and category of data to display

# PQ Dashboard Beta

## Simple Interface with Powerful Controls

- Switch between map and grid
- Standard map zoom and pan
- Drag to zoom

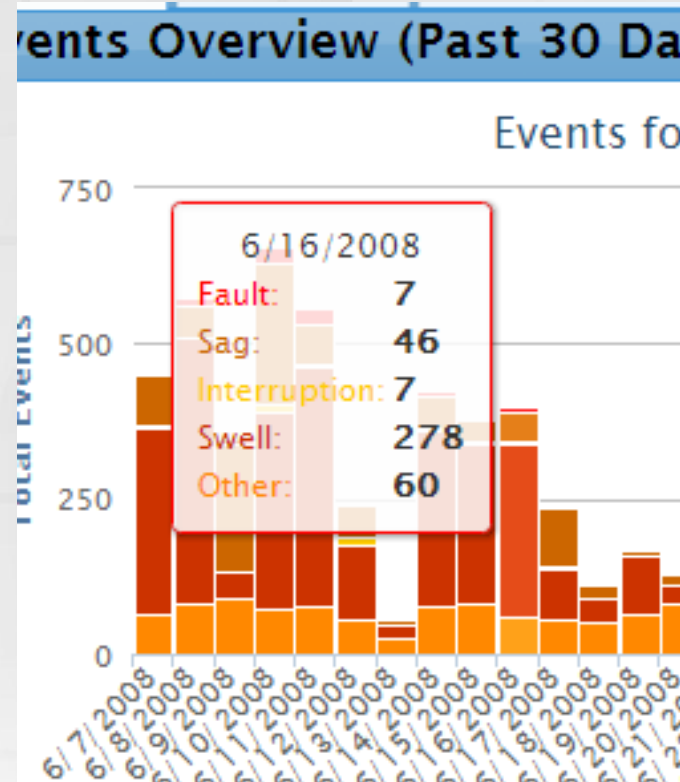


- Flexible site selection, list, click or drag

# PQ Dashboard Beta

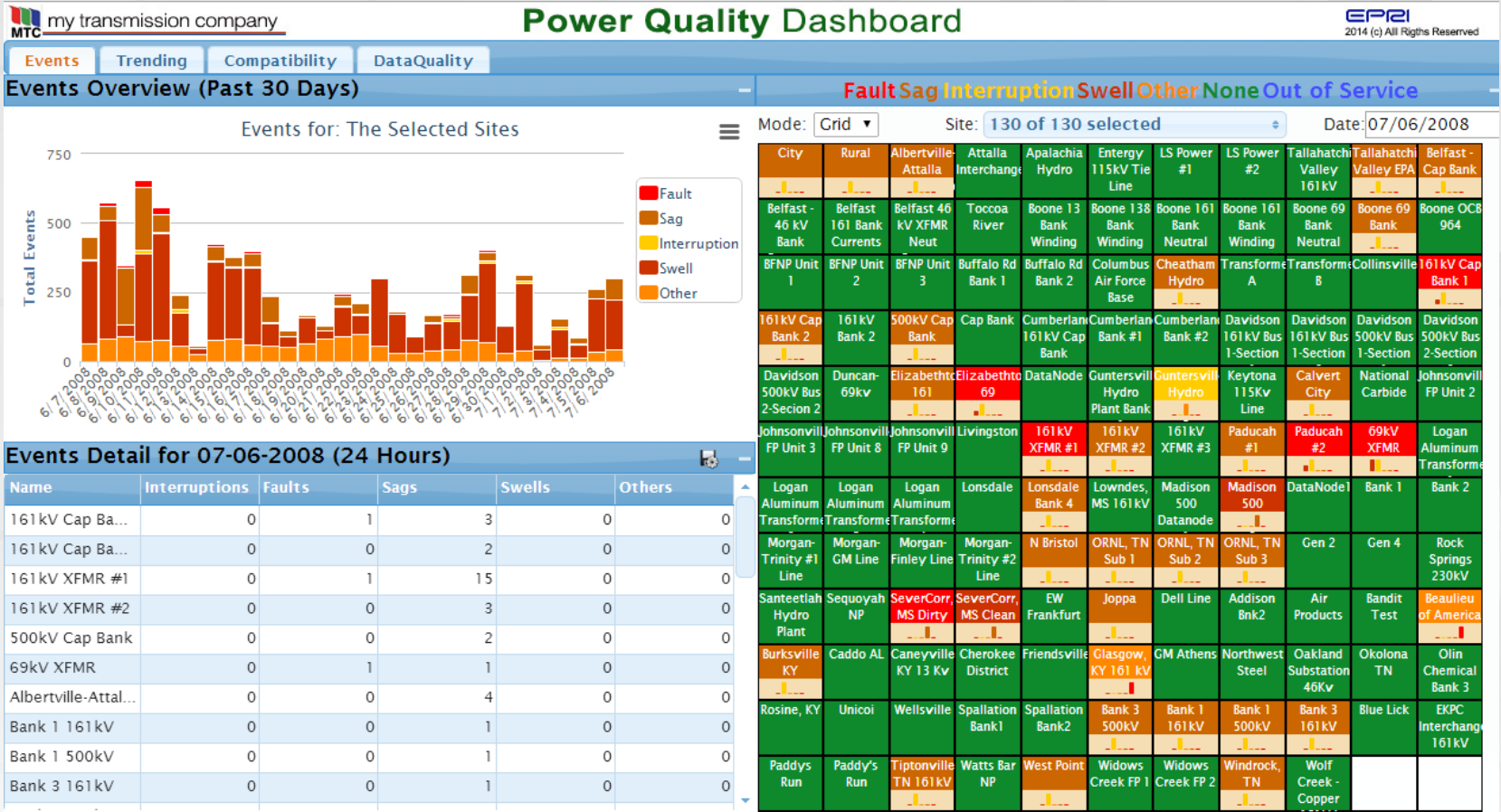
## Simple Interface with Powerful Controls

- Mouse-over tool tip
- Click daily bar for event detail table



# PQ Dashboard Beta

Initial test data provided by TVA





# PQ Dashboard Beta

Initial test data provided by TVA

**Power Quality Dashboard**

Events

Trending

Compatibility

DataQuality

Events Overview (Past 30 Days)

Fault Sag Interruption Swell Other None Out of Service

Events for: The Selected Sites

- Fault
- Sag
- Interruption
- Swell
- Other

Mode: Map
Site: 130 of 130 selected
Date: 08/12/2008

Events Detail for 08-12-2008 (24 Hours)

Name	Interruptions	Faults	Sags	Swells	Others
161 kV Cap Ba...	0	0	0	1	0
161 kV XFMR #1	0	0	0	8	0
161 kV XFMR #2	0	0	0	4	0
Albertville-Attal...	0	0	0	1	0
Beaulieu of Am...	0	0	0	0	48
Boone 69 Ban...	0	0	0	3	0
City	0	0	0	1	0
DataNode1	685	0	0	0	22
Glasgow, KY 1...	0	0	0	0	22
Lonsdale Bank 4	0	0	0	1	0

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**Power Quality Dashboard**  
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17

# Conclusions

- A dashboard approach for visualization brings new value to large volumes of data from a fleet perspective
- OSS development strategy ensures flexibility and extensibility
- Seamless integration can be accomplished with existing data sources and tools