2016 NASPI Work Group Meeting

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Session 6:

Integration of PMU Data in the Control Room

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PEAKRELIABILITY
assuring the wide area view

Same Problem – Different Control Room

- More and more data coming into the control centers responsible for larger areas than ever before
- Addition of PMU and other high definition data sources (even more data)
- Need to make it comprehensible by humans – turning data into information
  - Allow the most important data to rise to the top and be understood by operations staff
- Data and tools MUST be maintainable

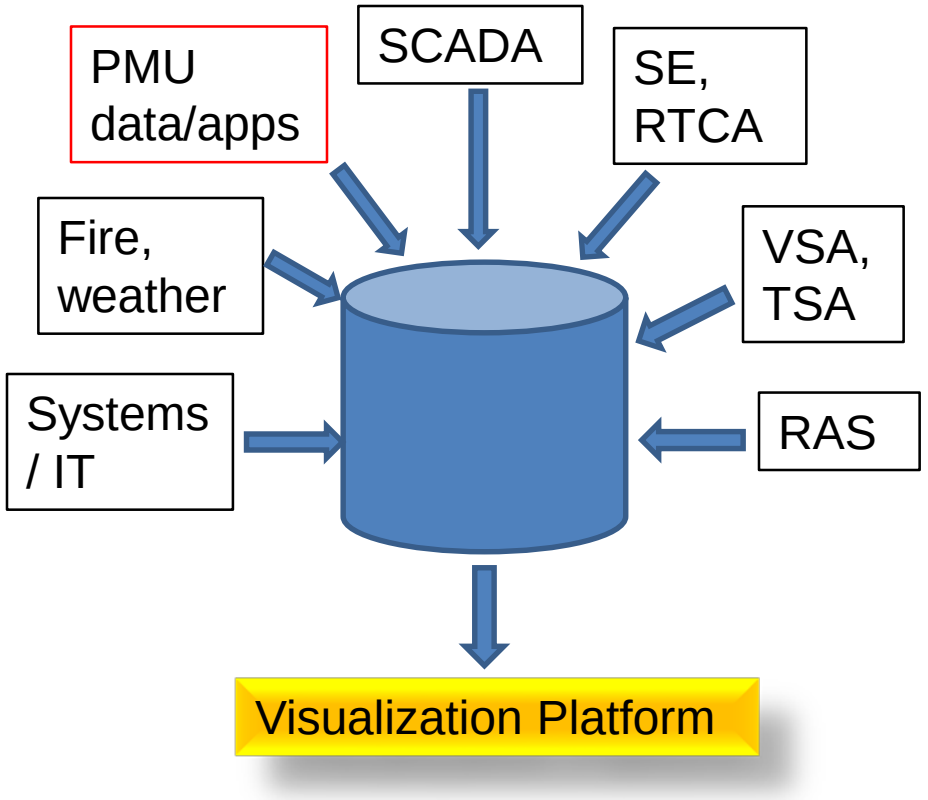
- Alarms
- SOL/IROL
- SE and RTCA
- ACE, generation, load, reserves
- RAS
- Systems / IT
- Voltage and Transient stability
- Phase Angles
- Oscillations
- Modal analysis

Keep It Together

- In some ways we already knew, but thought maybe PMUs were different
- Creating one-off solutions can never be better than integrating and improving the existing
- Evolution works – leads us to continuous improvement and sharpens focus

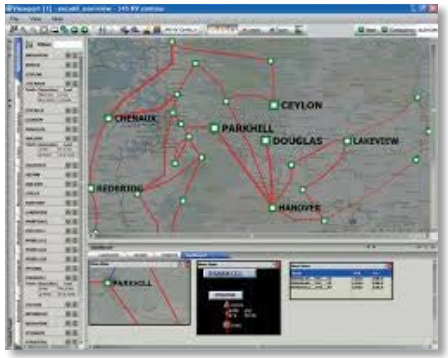
Integrating Data into Final Solution

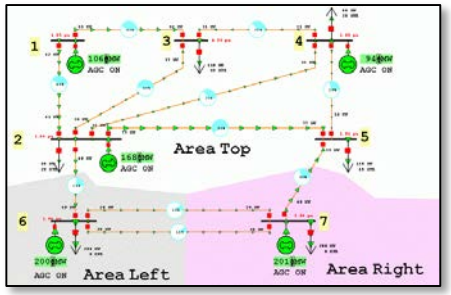
- Evolution works
- Integrated solutions better than one-off solutions



Experience Gained

- eTV
- WAV
- STI
- Macomber Map
- PowerWorld
- ESRI





Lots of solutions available – *it's about the best match*

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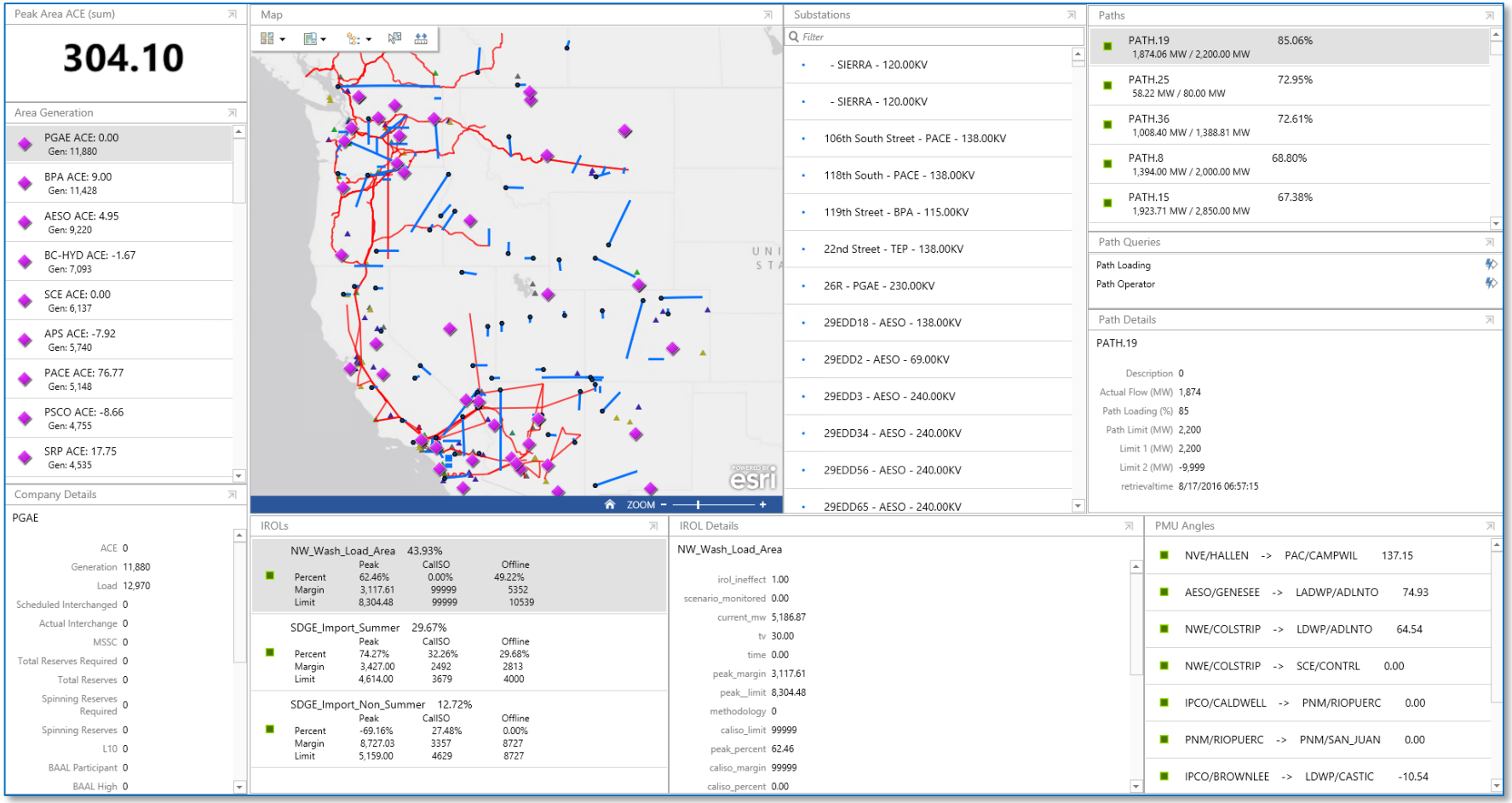
Peak Visualization Platform (PVP)



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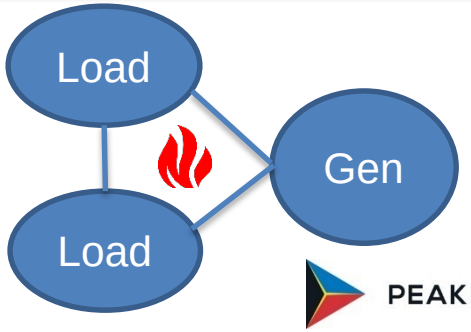
Applying the Technology to Grid Reliability

- Reduce the amount of time it takes an Operator to comprehend information.

- Fires impacts three 500kV lines, two 230kV lines, > 1,000 MW generation
- RC relies on phone to assess fire impacts, locations, and threats to other facilities – not timely
- No current geographically visualization
- Impacts Operating Plan
- Future state
  - Visualize fire location and boundaries *together* with operational impacts
  - Phase angles provide immediate indication of stress level (5-10 minute lead vs. analytical tools)



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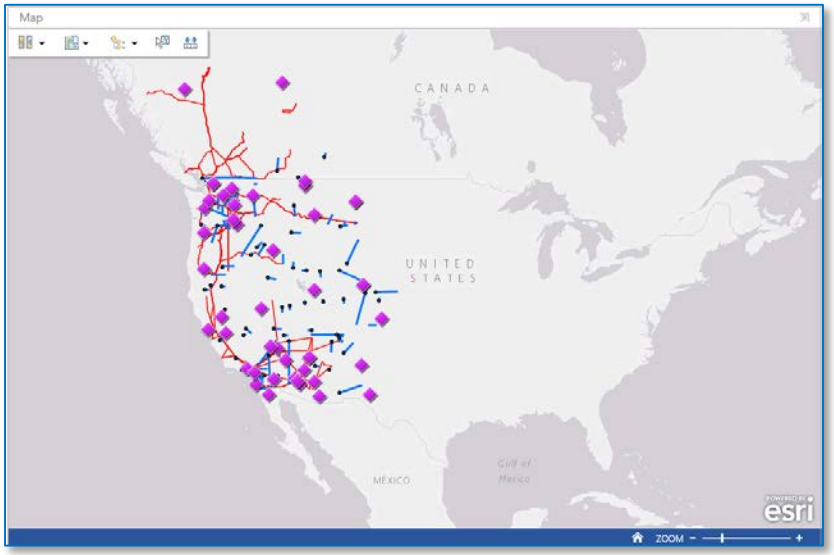
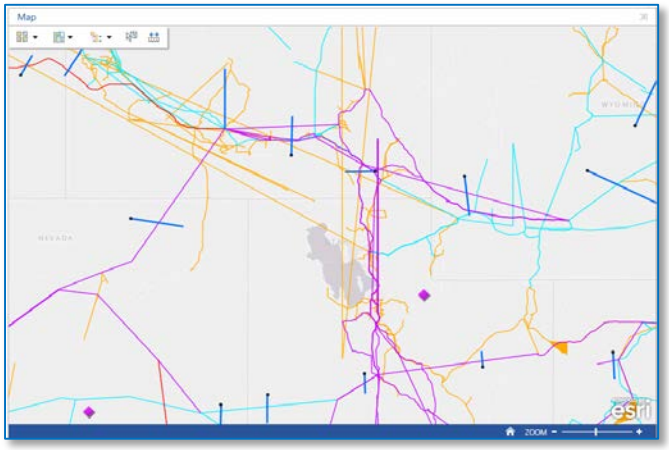
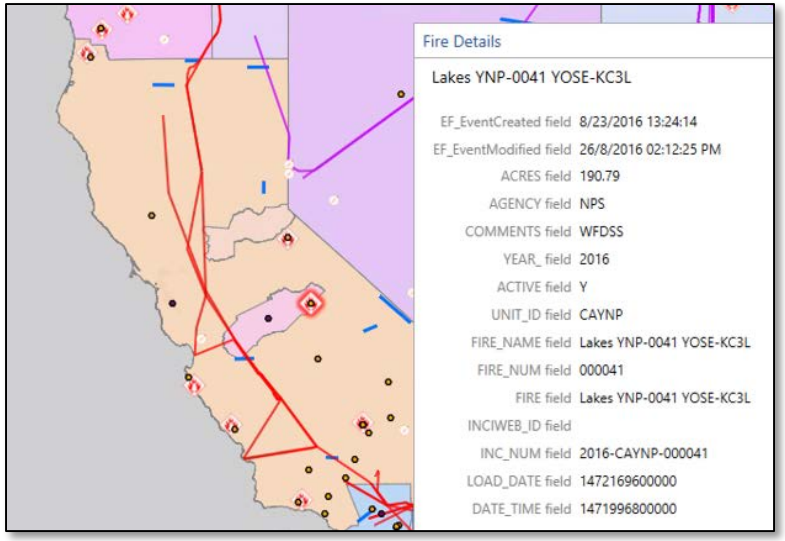
Navigation and Visualization







- Drill down capabilities
- Multiple data sources displayed
- Fire location, size and spatial geometry boundaries updating every 5 minutes from USGS

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Solution Highlights

- Easy display creation and modification
- Whiteboard philosophy
  - can build anything – not limited
- Data driven solution
- Leverage Peak Investment in OSIsoft PI
- EMS vendor Agnostic
- Quickly reconfigure based on input from users
- Future tool sharing with external reliability entities
- Eye toward secure external tablet and mobile use

What Value Was Achieved

- Organization of data to the operation staff
- Empowered operations staff to control their environment
- IT focuses on making data available
- Better decisions in less time

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