

Outage Management and Customer Voltage Analytics

Presenter: Austen DLima
Technical Lead – Field Technologies

EPIC Innovation Symposium

December 3, 2015

Presentation Overview

- Objective
- Concern/gap addressed
- Milestones addressed to meet objectives
- Progress to date
- Next steps
- Lessons learned for industry
- Recommendations for future demonstration projects

Objective

- Leverage SCE's deployment of smart meters for T&D operational benefits
- Conduct an Outage Management feasibility study to improve SAIDI/SAIFI metric calculation process
- Demonstrate analytics and visualization tools that improve distribution system awareness and modeling

Concern/gap addressed

- Better management of power quality issues at the customer & circuit level
- Improved management of transformer overloading conditions
- Enhanced compliance with Rule 2 thresholds
- Identify proactive measures for optimizing the distribution network usage
- Improved SAIDI/SAIFI metric calculation process

Milestones addressed to meet objectives

Milestones

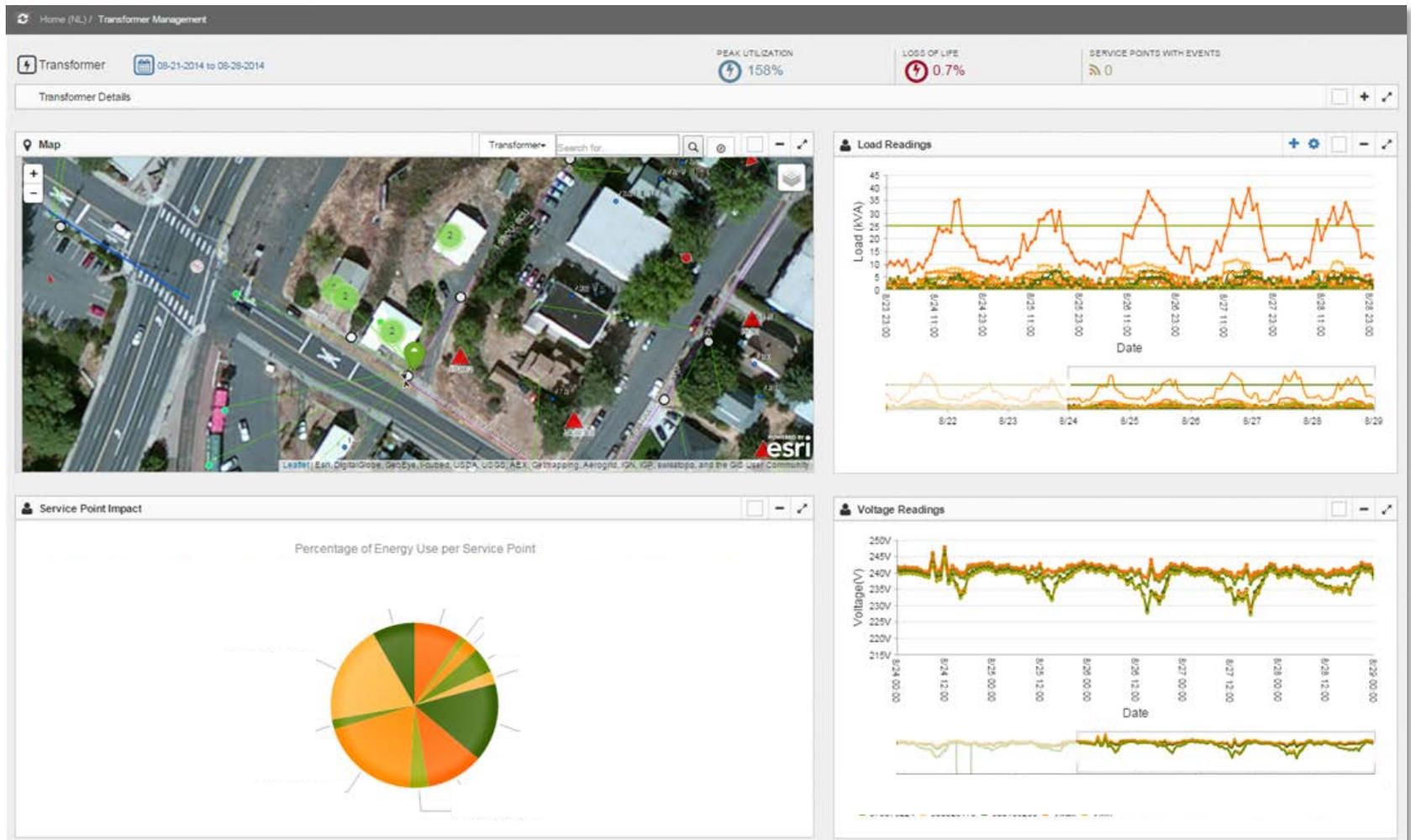
- Define business requirements
- Identify use cases
- Launch outage management study and voltage analytics demonstration
- Select circuits, key devices and bellwether meters
- Configure and demonstrate solution in test environment
- Outage management study report and voltage analytics deliverables
- Develop EPIC final project report

Progress to date

- Outage Management study complete
 - Identified some labor intensive steps to eliminate by use of smart meter data
 - Identified data integrity issues
 - Identified functional requirements for implementation
 - Developed report
- Voltage Analytics demonstration complete
 - Demonstrated use cases in Advanced Technology labs
- Technology demonstrated successfully, and approved for system-wide implementation

Transformer Loading

Evaluate peak load, loss of life and load allocations



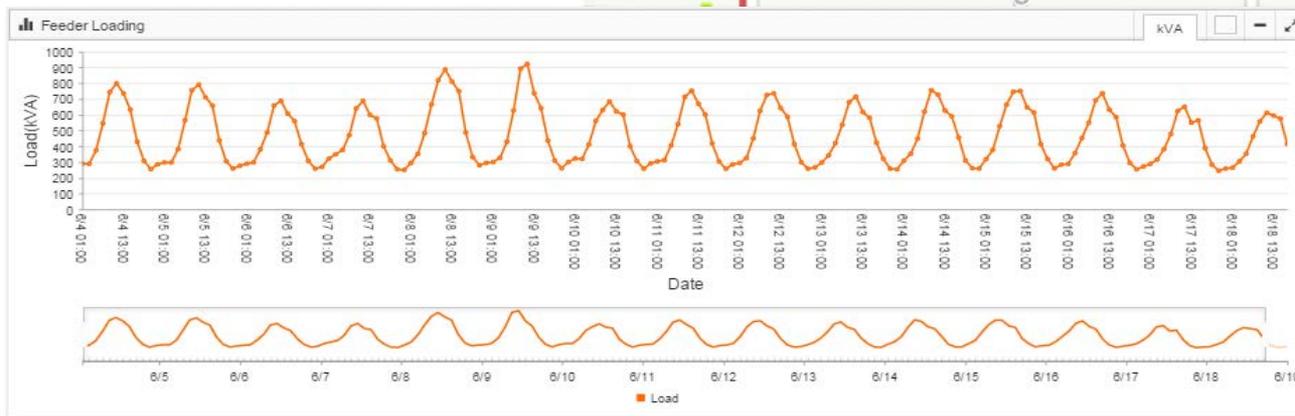
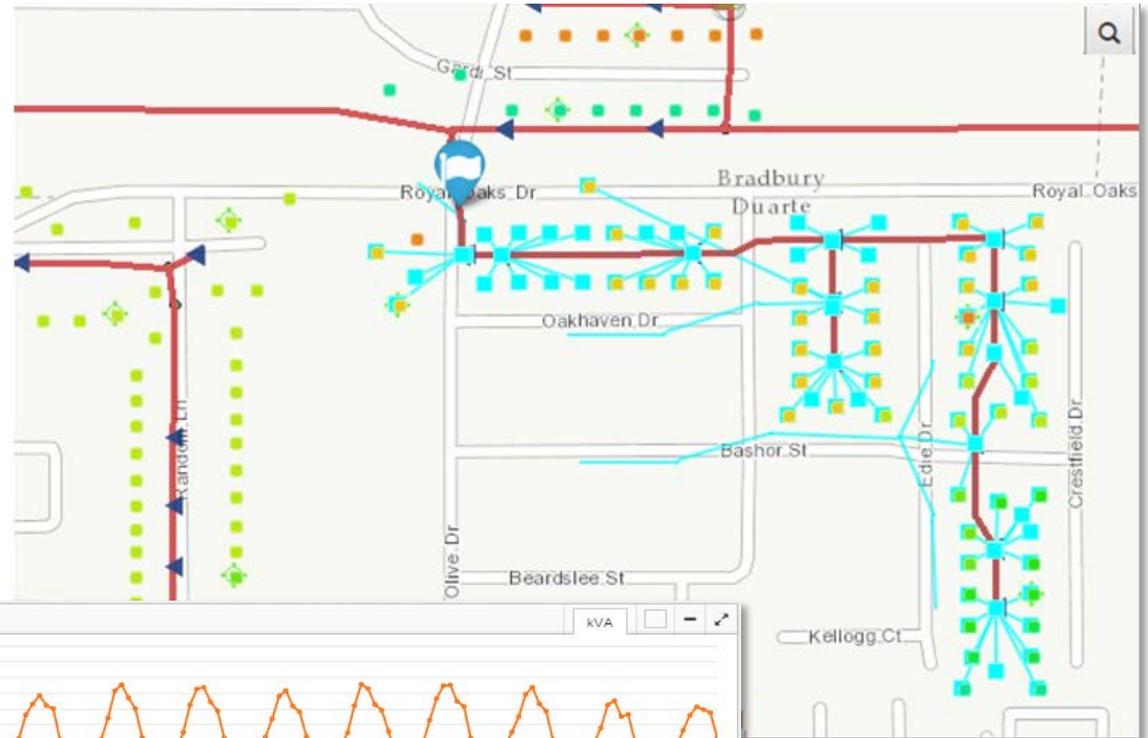
Transformer Overloads

- View area wide heat map of asset loading and at-risk transformers



Load Aggregation

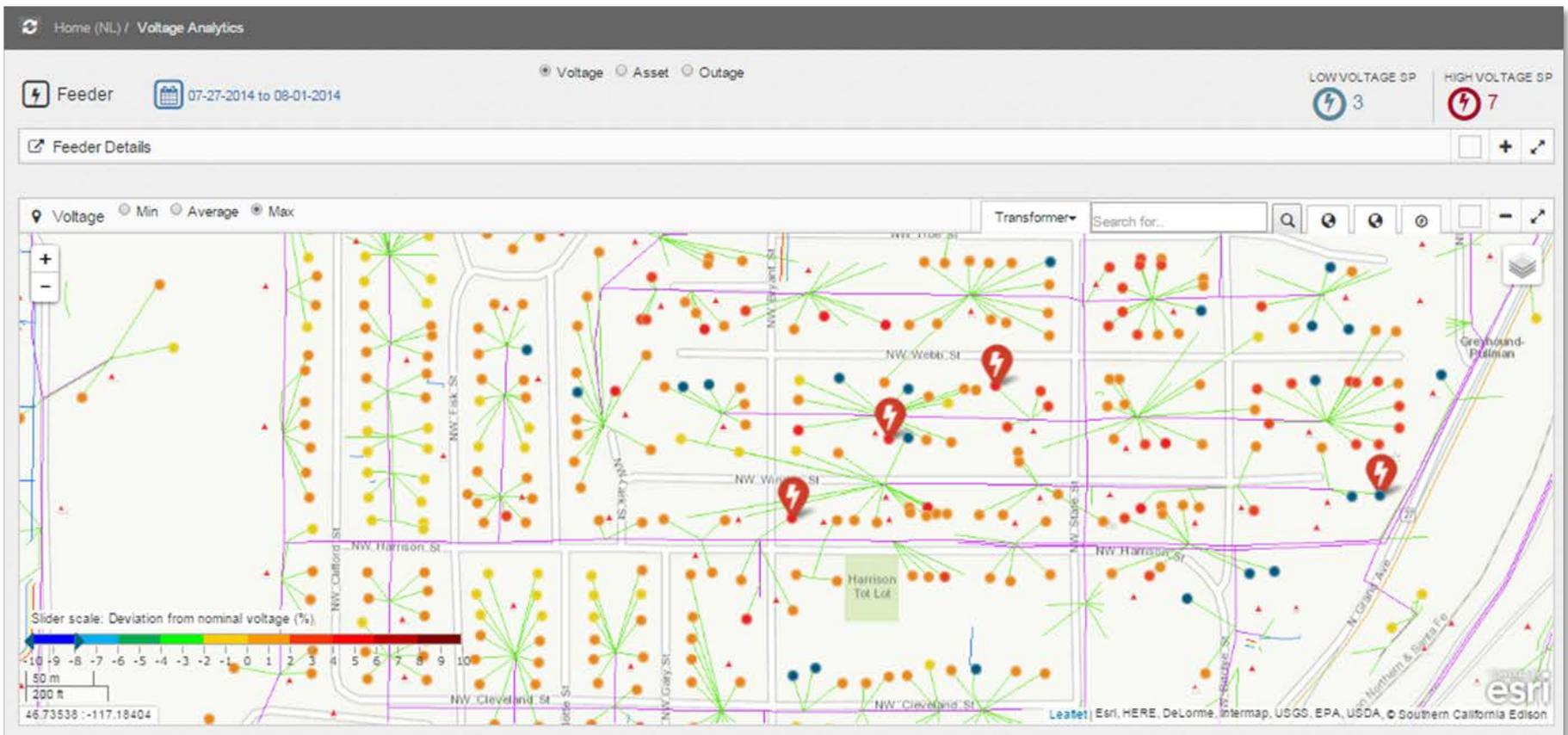
- Load profiles by circuit or at any system node (recloser)



Load profile downstream of selected recloser

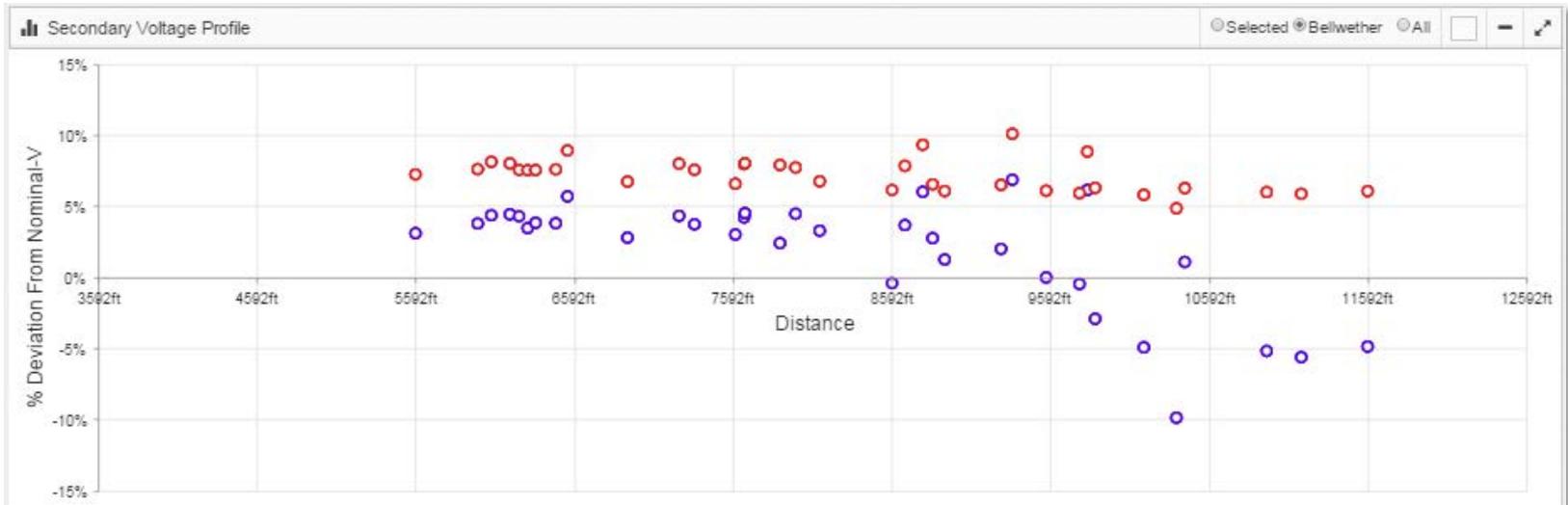
Voltage Management

View of system voltage fluctuations and assets outside of voltage limits

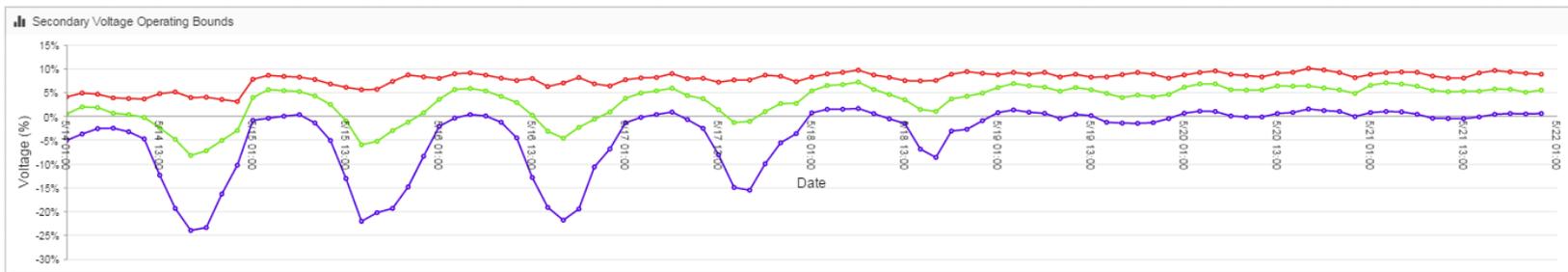


Secondary Voltage Profiles

View voltage profile along distribution circuit



Voltage drop vs. circuit distance from substation



Hourly secondary voltage bounds on circuit (min/avg/max)

Next steps

- Develop EPIC final project report to facilitate technology transfer
- Proceed with technology deployment activities

Lessons learned for industry

- Accuracy of meter-to-transformer association is foundational to any grid analytics tool using smart meter data
- Use of analytics tool that integrates DMS, OMS and MDMS infrastructure enables easy optimization of grid operations
- An analytics tool improves efficiency, saves distribution level planning time and provides important metrics

Recommendations for future demonstration projects

- Launch the Advanced Grid Capabilities using Smart Meter Data project