

# Smart Grid Demonstration Project – Dynamic Line Rating (DLR)

Tip Goodwin – Oncor Electric Delivery  
March 14<sup>th</sup>, 2012

DATA-DRIVEN SUSTAINABLE ENERGY SYSTEMS



# DOE SGDP – Oncor DLR

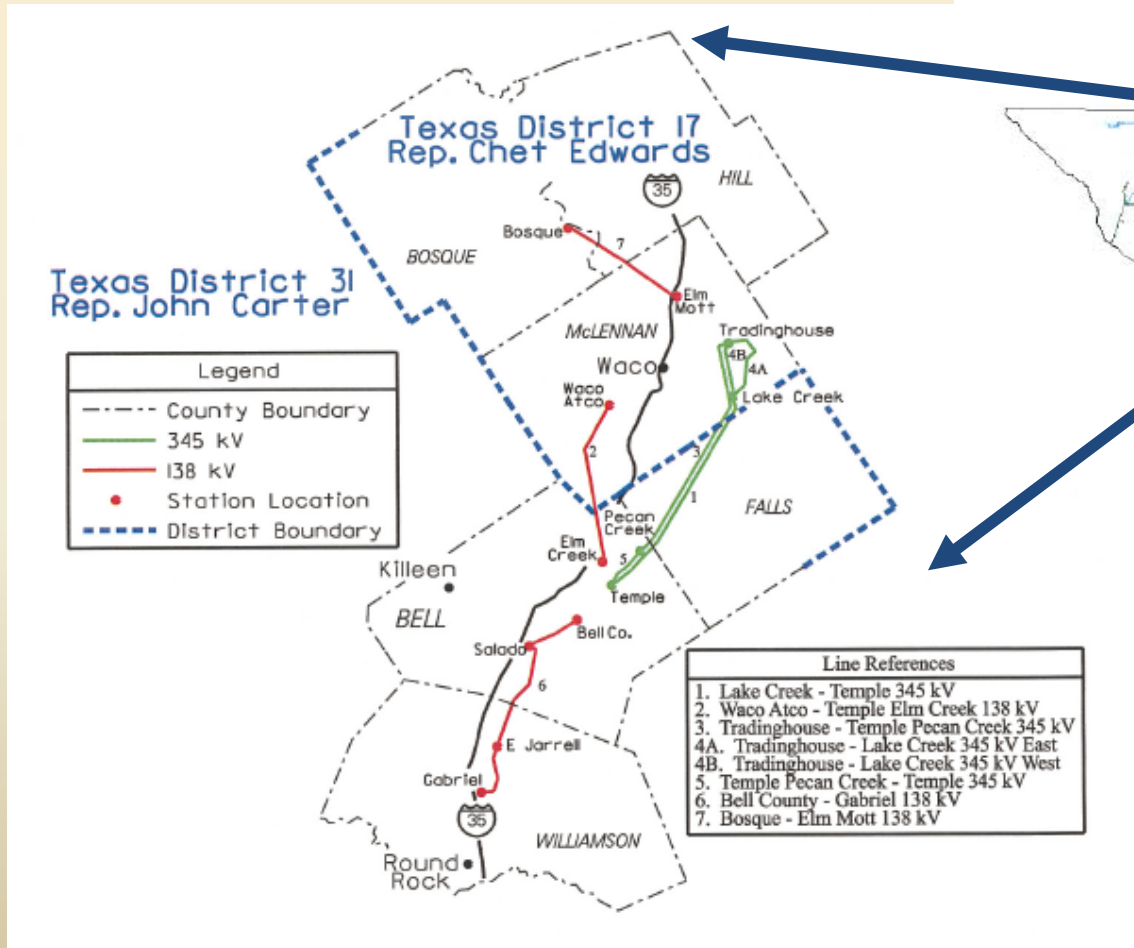
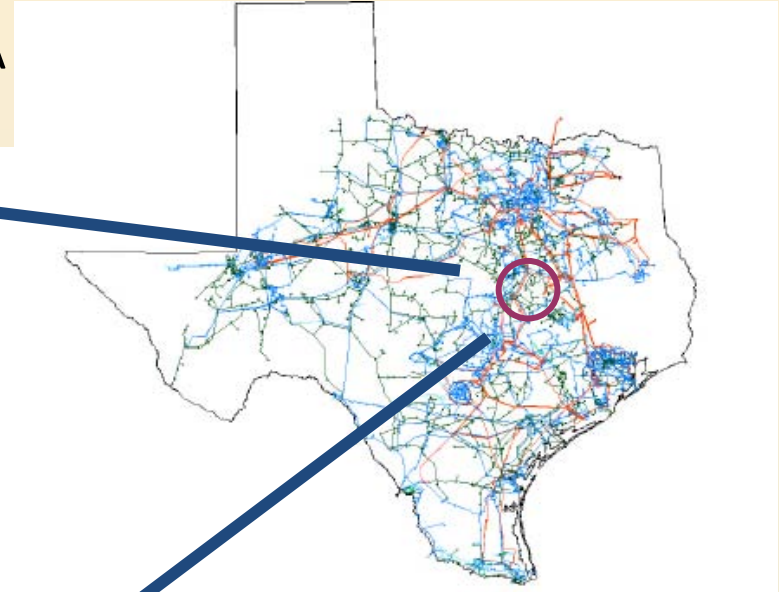
- **Acknowledgment:** "This material is based upon work supported by the Department of Energy under Award Number DE-OE0000320."
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# Project Objectives

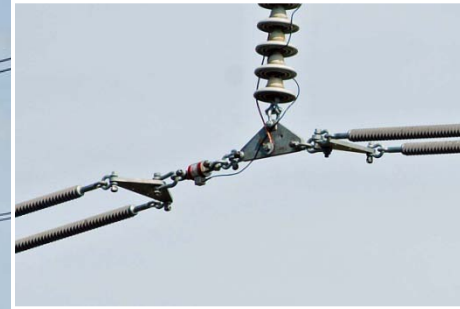
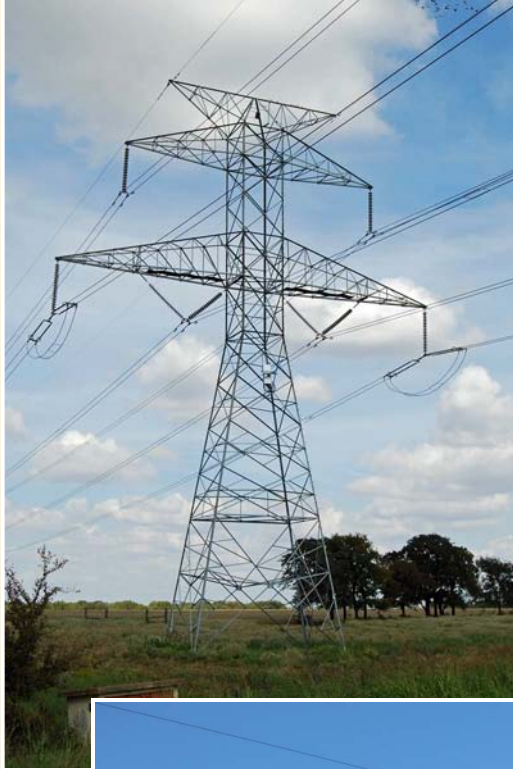
- Remove Existing Commercial Constraints
- Demonstrate that DLR Technology Can Be Reliably Integrated into Operations
- Quantify Cost Structure and Benefits for Future Grid Planning
- Establish Interoperability with Utility Transmission Management Systems
- Clear the Road for Wider Deployment

# LOCATION OF INSTRUMENTED CIRCUITS

- Study Area in Critical Congestion Zone
  - 42 Loadcell Tension Monitors
  - 8 Master Locations Feeding into SCADA

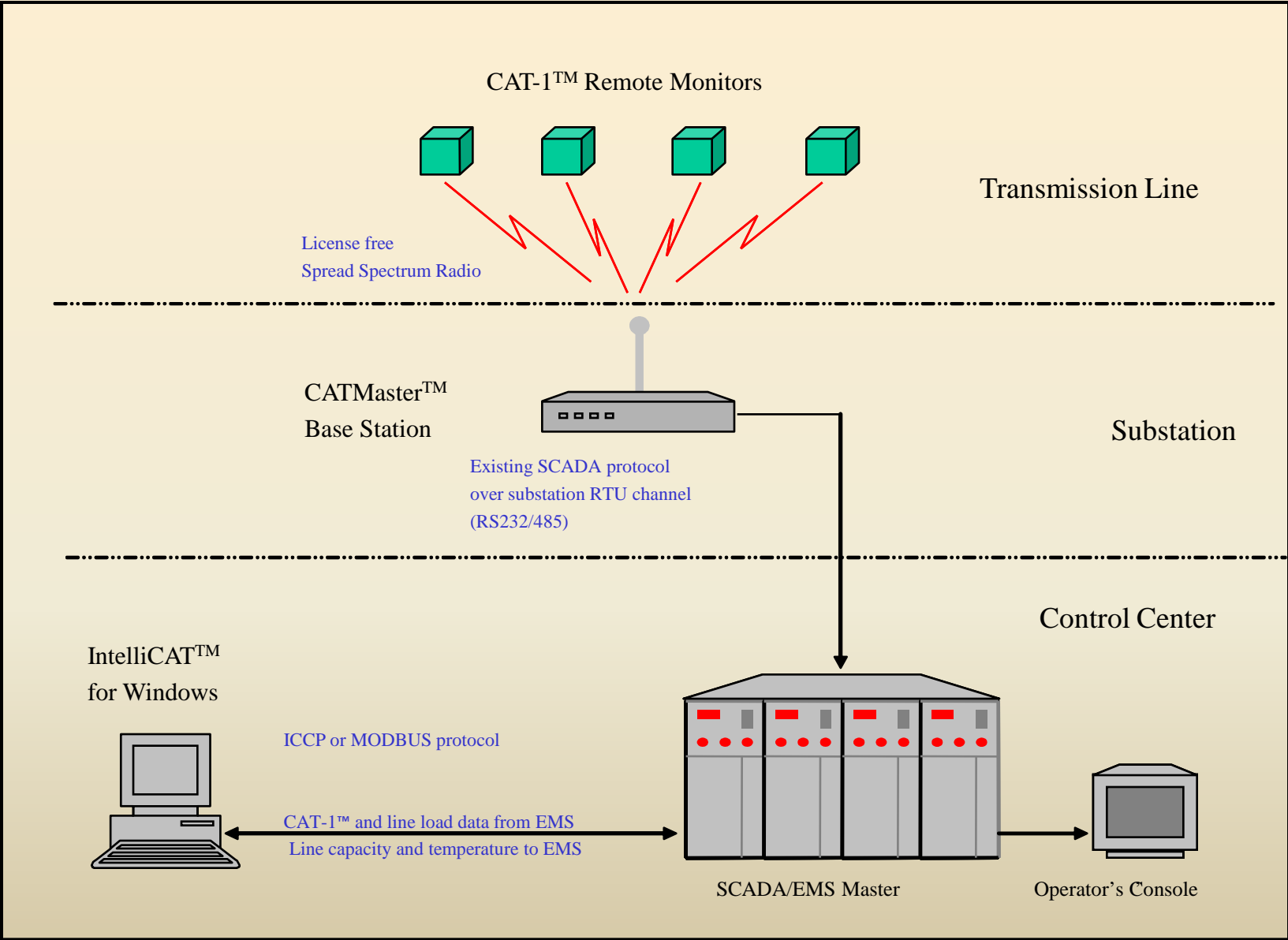


# Integrated Dynamic Line Rating

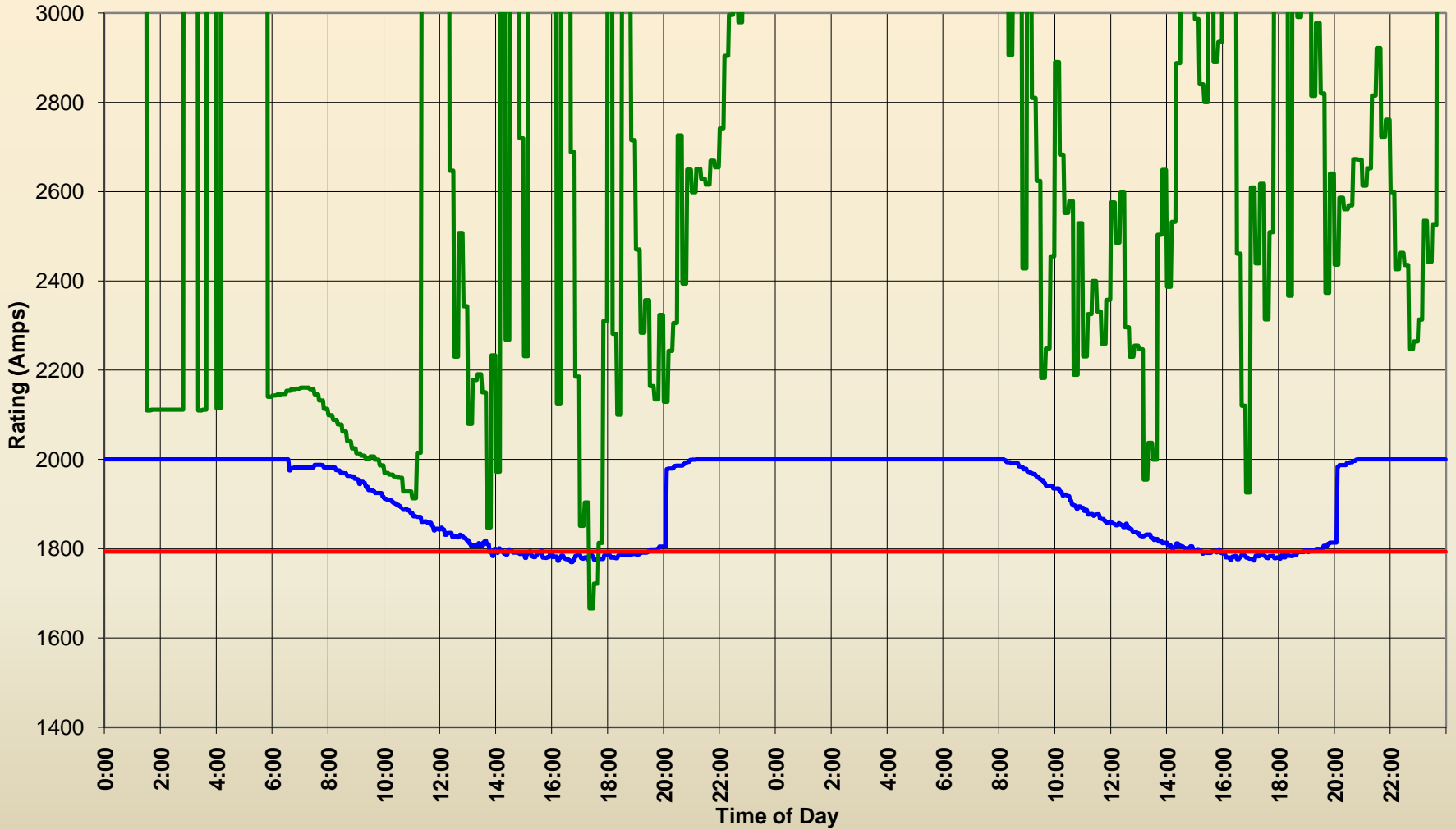


- Tension-based Dynamic Line Rating System for overhead transmission lines
- Tension resolves all environmental factors for accurate results
- Best way to capture spatial variability of wind, sun, air temperature

# INTEGRATED MONITORING – RATING SYSTEM

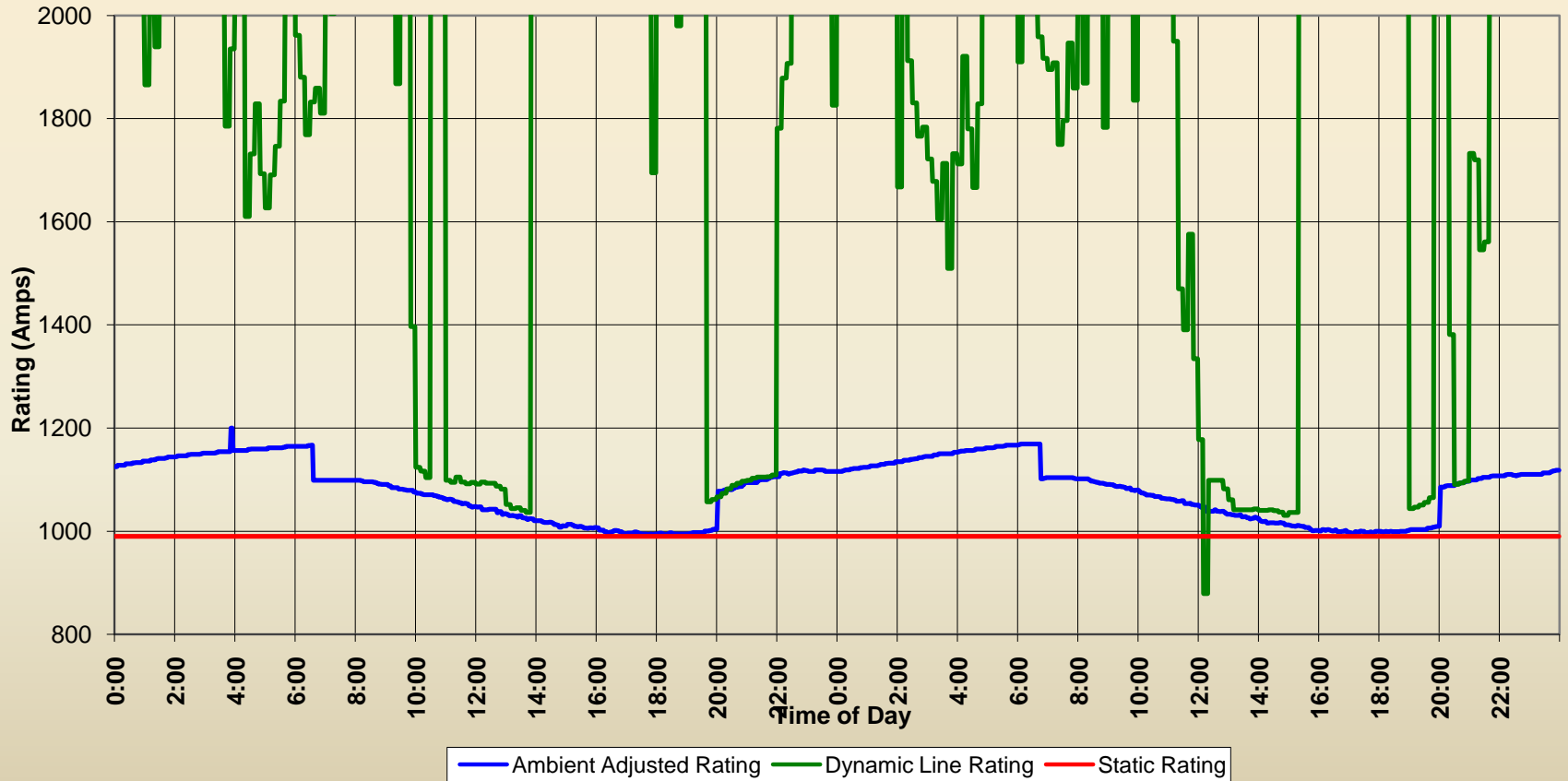


Dynamic Line Ratings and Ambient Adjusted Ratings  
Tradinghouse-Lake Creek West 345 kV, August 2-3, 2011



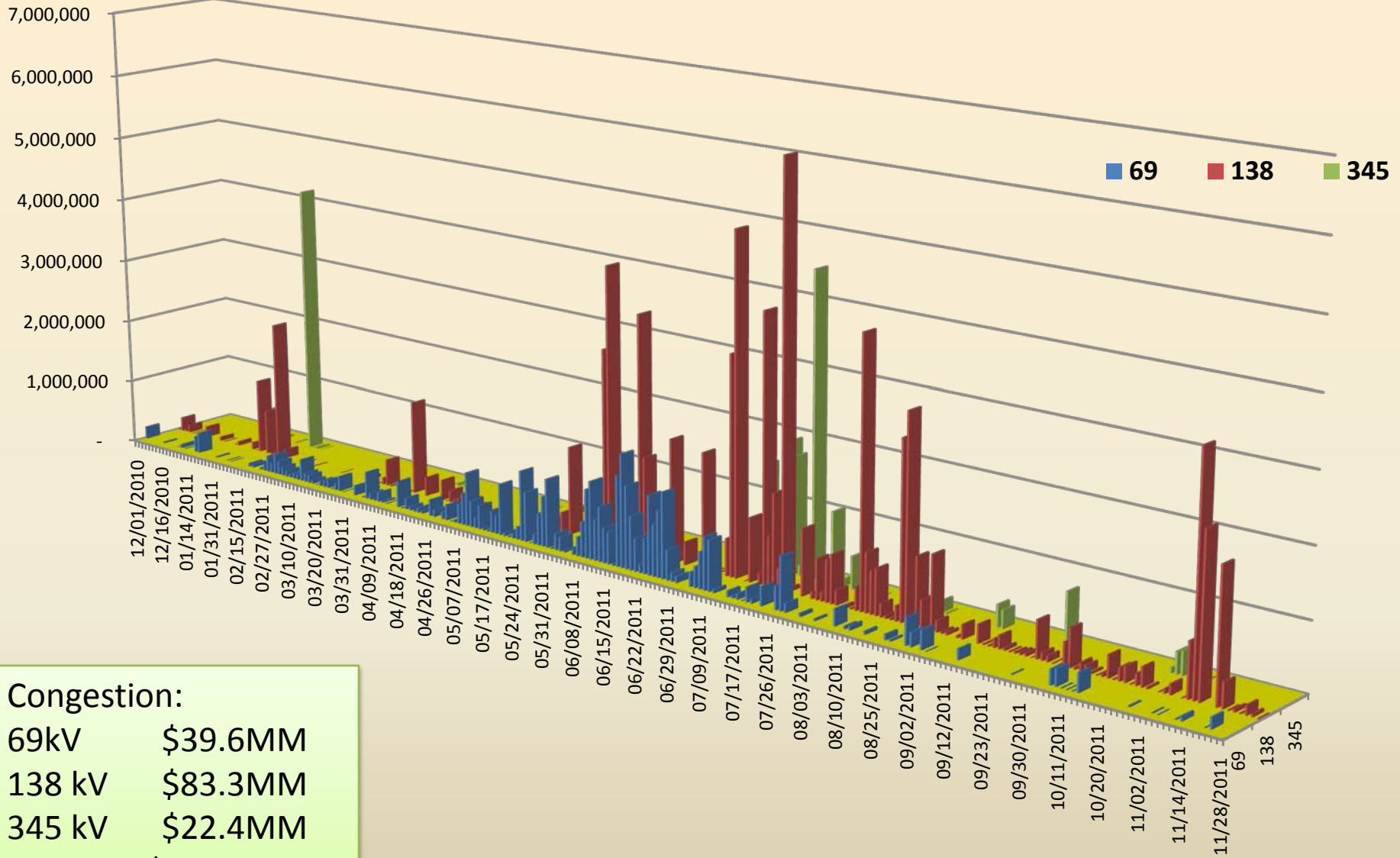
— Ambient Adjusted Rating — Dynamic Line Rating — Static Rating

Dynamic Line Ratings and Ambient Adjusted Ratings  
Bell County - Salado 138 kV, August 9-10, 2011





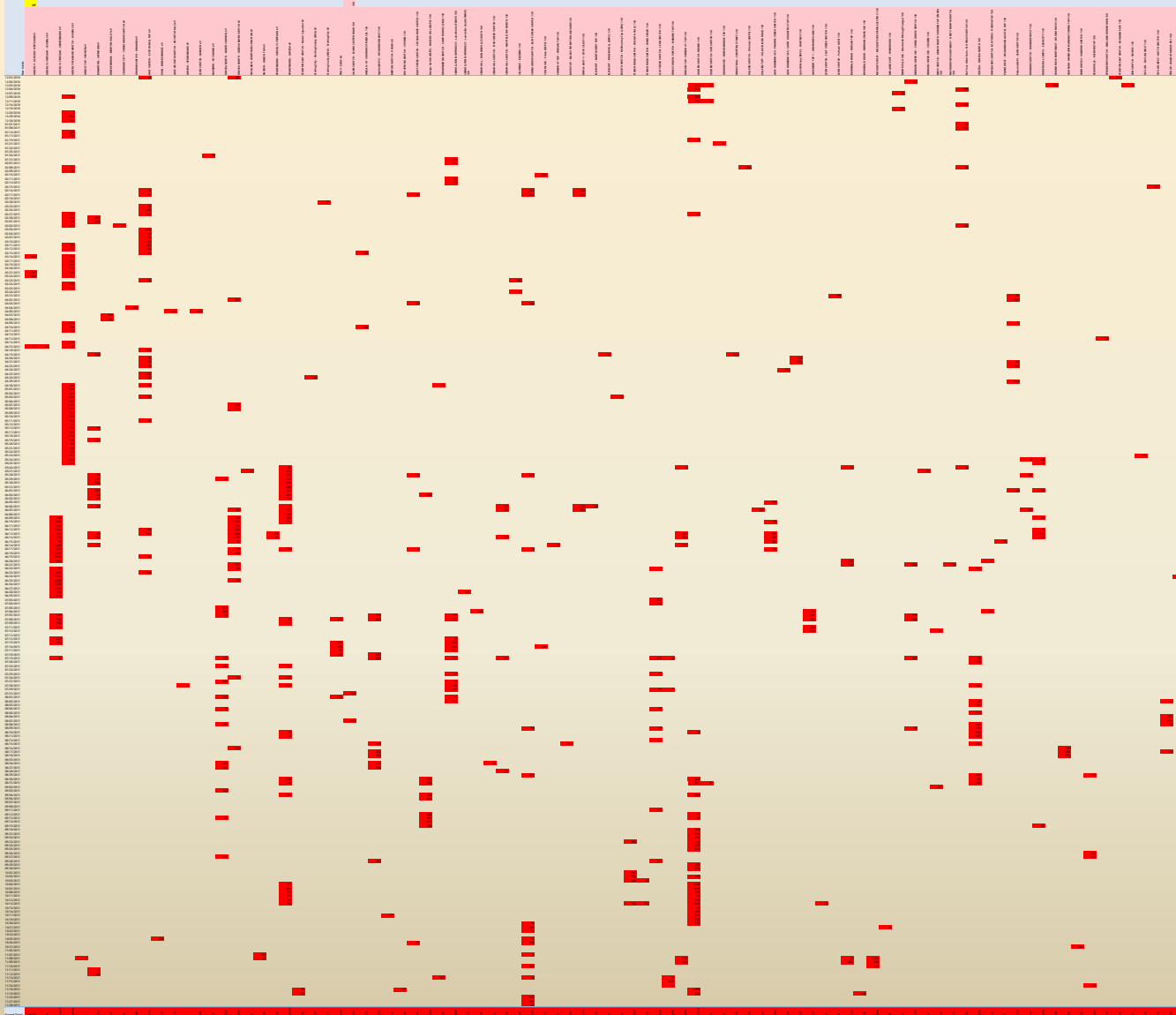
# Security-Constrained Economic Dispatch Congestion from 12/1/2010 – 11/30/2011



# Congestion – When & Where

## Chronic or Sporadic?

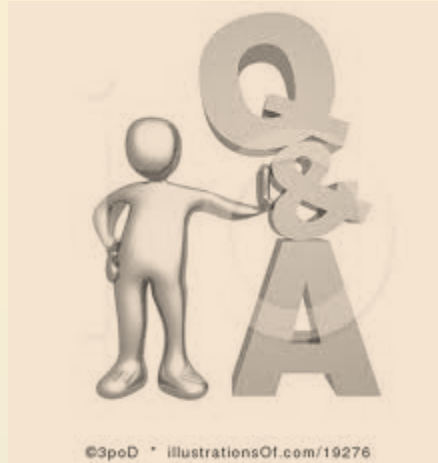
Date – showing daily congestion



Lines

# Observations

- ✓ DLR can deliver added capacity more than 95% of time
- ✓ Congestion is sporadic
- ✓ N-1 Contingency design drives operations
- ✓ Defer capital investments to meet congestion, load growth, or NERC alert
- ✓ DLR flexibility better solution than large capital solutions



Tip Goodwin

Oncor Electric Delivery

[Tip.goodwin@oncor.com](mailto:Tip.goodwin@oncor.com)

817.215.5609