

Analytics Architecture

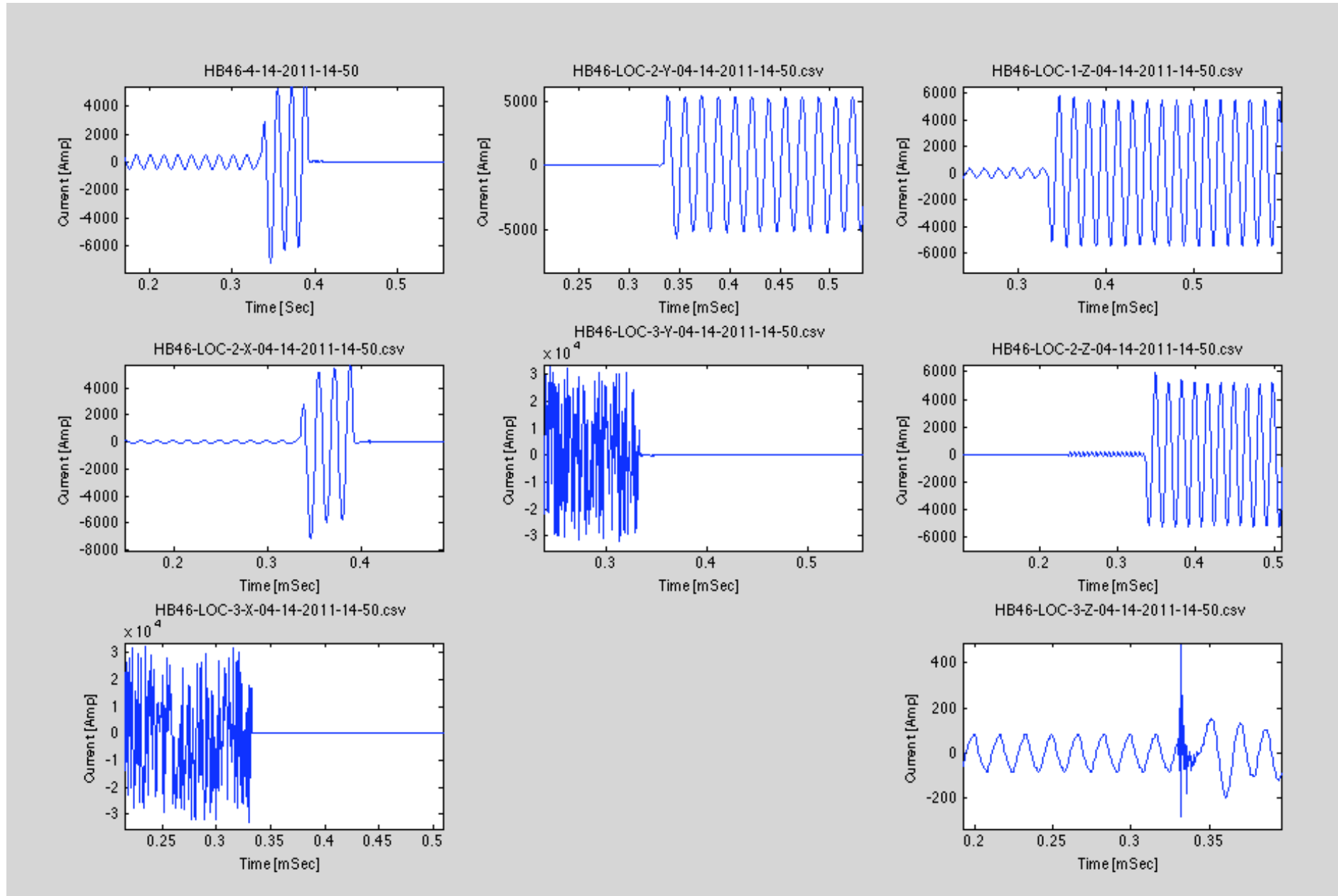
Greg Nulty
VP of Technology Planning
Tollgrade Communications
gnulty@tollgrade.com

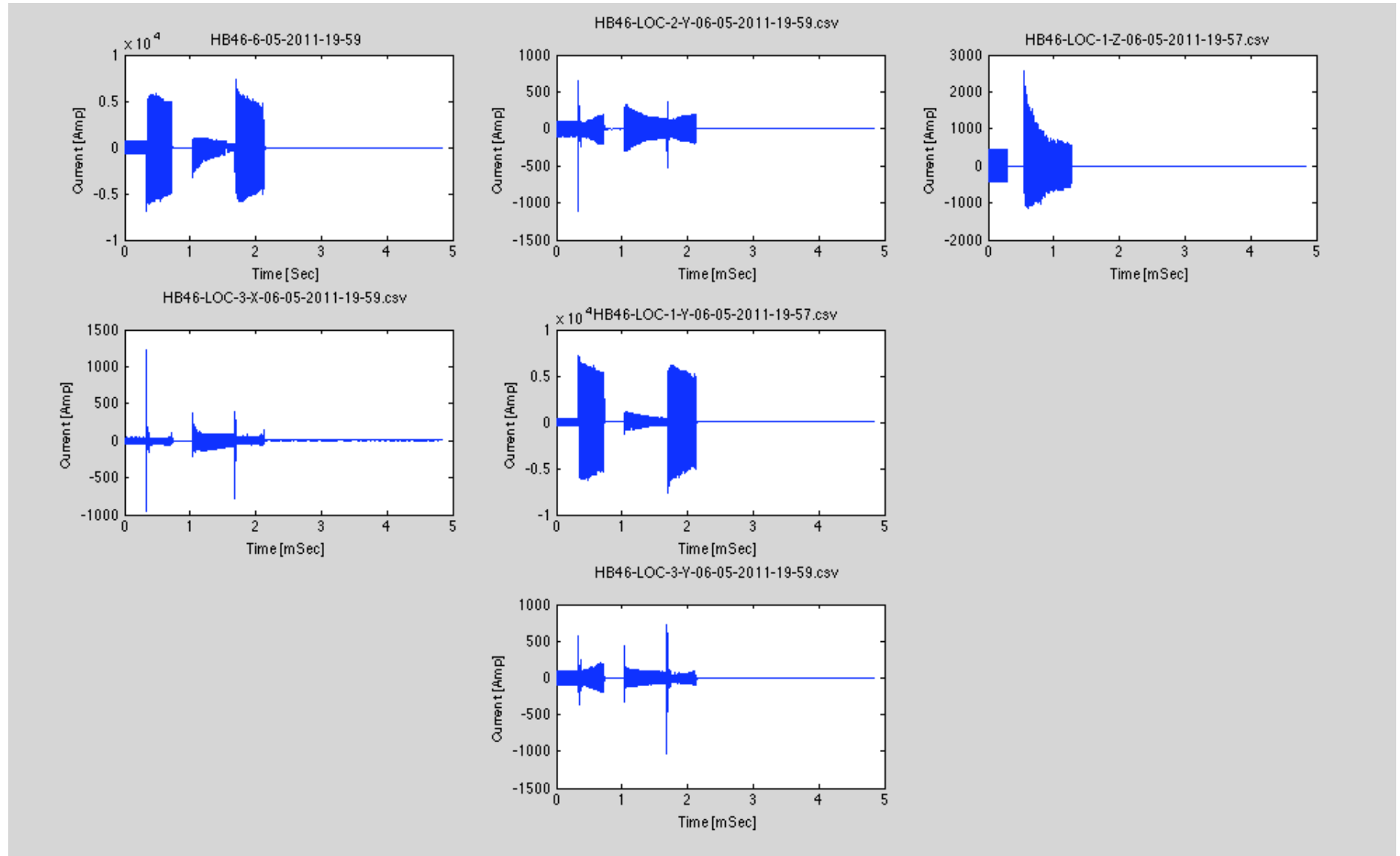
- Start with Monitoring High Voltage Transmission, Substations, and Smart Meters – lots of data
- Still ‘Blind’ in the Medium Voltage grid
- Add Fault Indicators
- More data, some visibility, but no precise answers
- Add Medium Voltage sensors – produce more volumes of data
 - Startling visibility into your network
 - Full time job just trying to wrestle with the data

“According to Pike Research, the requirements of smart grid data analytics will surpass the capabilities of traditional business intelligence systems. As a result, progressive utilities are working to develop situational-awareness systems that apply business rules to incoming data, adjusting the parameters of grid operations automatically and in real time.

Predictive analytics capabilities are also becoming increasingly important as a means of helping utilities with highly detailed tactical operations planning, the firm adds.”

Source: Renew Grid on Monday 15 August 2011





- Add analytics capability to give you the Information you need to run your network
- Vegetation Management
- Asset Management
- Load Balancing – Electric Vehicle Charging
- Renewable Energy Management
- Fault Detection and Isolation
- On Line Power Flow Analysis
- Predictive algorithms for deterioration and failure of Assets

- Identify the operational condition of major assets in near real time
 - Transformers
 - Conductors
 - Reclosers
 - Cap banks
 - Sectionalizers
 - Voltage regulators
 - Lightning arrestors
- Know the actual load profiles of these assets
- Pinpoint problem assets before they cause trouble
- Minimize O&M costs while simultaneously maximizing reliability
- Methodically prioritize maintenance projects and capital investments

- Voltage Sag/Swell
- Frequency
- Surge/Transients
- Power Factor
- Harmonic Distortion
- Partial Discharge

- Conductors
 - Conductor temperature
 - Current/Load – current carrying capability
 - Power Factor
 - Phase balance
 - Wind – cable sway
 - Line sag
 - Ice
 - Tree incursions

- Electronic devices throughout the grid provide considerable data collection capability – but that data can/will overwhelm operations
- Analytics and intelligent algorithms give you the solution to create focused information out of the vast amount of data, to effectively run your networks.