Distribution GIS & Grid Model Data Management

Supplemental Project

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Distribution GIS & Grid Model Data Management Project
The New Distribution World

- Now
  Transmission Network
  Radial Distribution to Load
  Bulk Generation in Wholesale Market

- Not-too-distant future

New Grid-Connected Equipment
- PV
- Storage
- EV

New Players
- DER Aggregators

New Expectations
- Regulatory
- Customer

New Technologies
- Sensors
- Intelligent Relays
- Tablets
- AR

Not your grandfather’s grid
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The New Distribution World

- Utility aspirations
  - Proactively leverage the benefits of DER
  - Accurate fault location, isolation and service restoration
  - Effective asset management to prioritize expenditures, improve reliability & reduce maintenance costs
  - Benefit from the energy efficiency improvements of advanced Volt/VAr control

- Automation solutions
Utility-owned grid asset data

Field data
  - AMI readings, load
  - Real-time measurements, multi-second and sub-cycle

Geospatial data

Non-utility owned asset data

Non-grid asset data
  - Protection assets
  - Communications assets
  - Cyber security assets

Grid model data

Field device configuration data
Utility-owned grid asset data

Field data
  – AMI readings, load
  – Real-time measurements, multi-second and sub-cycle

Geospatial data

Non-utility owned asset data

Non-grid asset data
  – Protection assets
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Grid model data

Field device configuration data
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Why GIS and Grid Model Data?

- Because **grid model data** underpins many future applications

- Because **GIS data** is the usual source from which grid models are derived
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Why is managing GIS and Grid Model Data a Challenge?

Because…

- **Grid model data**
  - Is big (variety and volume)
  - Must be cohesive to serve network analysis functions
  - Is made up of different types of data
  - Comes from multiple sources (including the field)
  - Is needed for the past and future

- **GIS data**
  - Often has major consistency / completeness issues
  - Often serves primary purposes other than providing grid model data
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So…. 

▪ In summary
  – Distribution utilities will deploy multiple applications/tools/systems
  – Many of which require accurate grid model data
  – That is difficult to manage

▪ A data management foundation for GIS and grid model data
  – Reduces risk of bad data causing errors in
    ▪ operations decisions
    ▪ study results
    ▪ capital planning decisions
    ▪ maintenance decisions
  – Saves labor wasted in duplicate entry, chasing bad data
  – Improves timeliness of results, decisions and actions
Consistently across industry

In well-established silos

- Every tool requires its own network model, in its own format
- Every tool has its own users and maintainers
- Silos are both technical and organizational

"Learning from Older Brother’s Mistakes"
Consistently across industry

In well-established silos
- No overarching data management strategy
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Network Model Data Management in Transmission
"Learning from Older Brother’s Mistakes"

- EPRI has done work in Transmission
  - Growing utility buy-in
  - Growing vendor product support
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- Multi-year, multi-utility collaborative supplemental project
- Goals
  - Define architecture for Distribution grid model data management
  - Promote industry understanding of grid model data management and vendor product support for it
  - Provide participating utilities with actionable strategies for improving GIS data and grid model data derived from it
  - Advance the data exchange standards to fully support Distribution grid models
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- **Project areas**
  - GIS data cleanup
    - ‘Technologies of Promise’ exploration
    - Geo-spatial modeling best practices
  - Field crew enablement
    - Solution architecture evaluation
    - Demonstration
  - Distribution enterprise grid model data management
    - Utility deep dives (up to 5)
    - CIM standard advancement
    - Distribution Grid Model Management Tool requirements
Collaborative Project Activities

- 30-month project
- Initial funders will guide project definition
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▪ Pricing
  – Level 1 (or basic) participation
    ▪ small utility $100K
    ▪ medium utility $150K
    ▪ large utility $200K
  – Level 2 (focused deep-dive) $25K adder

▪ More information
  ▪ Supplemental Project Notice #3002009807

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