PJM Interconnection
Dispatch Interactive Map Application
DIMA

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PJM
Interconnection

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Integral GIS
Who is PJM? – Focus on Just 3 Things

**Reliability**
- Grid Operations
- Supply/Demand Balance
- Transmission monitoring

**Market Operation**
- Energy
- Capacity
- Ancillary Services

**Regional Planning**
- 15-Year Outlook
• Ensures the reliability of the high-voltage electric power system
• Coordinates and directs the operation of the region’s transmission grid;
• Administers a competitive wholesale electricity market;
• Plans regional transmission expansion improvements to maintain grid reliability and relieve congestion.
PJM’s Role as a Regional Transmission Organization

Air Traffic Controllers for the Transmission Grid

Match Generation to Load

Stock Market for Electricity

Energy Market Pricing
The Distribution of Power

- **Generation**
- **High Voltage Transmission Lines**
- **Substation**
- **Local Distribution Lines**

**PJM Grid Operator**

- **Control Room**
- **Nuclear**
- **Hydro**
- **Wind**
- **Residential**
PJM Expansion History

- 1927 – Started three utility power pool
- 1997 – Started RTO with eight TOs
- June 2002 – AP Joined
- May 2004 – ComEd joined
- October 2004 – AEP/Dayton
- May 2005 – Dominion joined
- January 2006 – Duquesne joined
- June 2011 – FirstEnergy joined
- January 2012 – Duke joined
- June 2013 – EKPC joined
Evolution of GIS at PJM

**Original GeoDatabase**
- Arbitrary Metadata
- Drawn substation details
- TO One-lines source of information
- Planning database
  - Queued Projects

**Enhanced GeoModel**
- Automated processes
- Metadata extracted from PI database
  - Generator AF Model
  - Reactive Device AF Model
- Integrated EMS One line diagrams
- Real-time data available
  - Line outages
  - Equipment availability, etc.
Enhanced GIS Data Model

1. Missing Line Report → Is Line Retired or Future
   - Future
     - If Future add the MRID id manually to an Exception report in GEO Model System.
     - MRID ID exists in the Future Line Energised report
       - Yes
         - Add the Transmission Line to GIS(Manual)
       - No
         - Compare the MRID id in Geo Model exception report to EDART ticket system where Cut In flag is true. Send report of the units to appropriate list
         - There needs to be an automated process that cleans the exception list
   - Retired
     - If Retired remove the Line from GIS (QA, Default and Replica and push to DI/MA)

New Report to be built called the Future Line Energised
Dispatch Interactive Map Application - demo
Future: Substation Detail

Salem (New Jersey)
Facility ID: SKLENX00
Zone: Public Service Electric and Gas Company

Generators (3)

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Current MW</th>
<th>Icap MW</th>
<th>EcoMax MW</th>
<th>Gas</th>
<th>Status</th>
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<tr>
<td>LIMERICK 1</td>
<td>Nuclear</td>
<td>1,000</td>
<td>1,800</td>
<td>1,700</td>
<td>No</td>
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<tr>
<td>LIME 1</td>
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<td>80</td>
<td>100</td>
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Equipment

- Capacitors: 2
- Reactors: 8
- Gas Pipelines: 3

Limerick (Pennsylvania)
Facility ID: LIMEPA00
Zone: PECO Energy Company

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Pipeline Capacity
- 20 MW
- Connection: Delaware
- Gas to Start: Yes
Challenges and Benefits

Business Challenges

- Multiple tools used for situational awareness
- Limited geographic awareness
- Need to process a significant amount of data

Solution(s)

- DIMA – Dispatch Interactive Map Application
- Esri & OSIsoft Technology Integration

Results and Benefits

- Improved situational awareness
- Integrated data sources in one application