



SUMMARY

PJM Interconnection®

Industry

Power and Utilities,
Transmission and Distribution

Business Value

- Energy Utilization
- Situational Awareness
- Asset Health

PI System™ Components

- PI Server™
 - Data Archive
 - Asset Framework
- PI ProcessBook™
- PI Integrator for Esri® ArcGIS®

Partners

Esri

Improving Grid Operator Situational Awareness by Combining Space and Time

PJM Interconnection is responsible for maintaining grid reliability and running energy markets across 13 states and the Washington DC area. As one of the largest transmission operators in the country, they serve 61 million people and manage a peak load of 163,000 megawatts. To improve its operators' situational awareness, PJM recently developed the Dispatch Interactive Map Application (DIMA), which brings together real-time grid, weather and spatial data using ESRI ArcGIS and the OSIsoft® PI System. Erich Cline, Software Architect, Integral GIS; Frank DiCiccio, GIS Lead; and Ed Kovler, Solutions Architect presented a demonstration of DIMA at the 2015 OSIsoft Users Conference in San Francisco.

Mr. DiCiccio and Mr. Kovler opened the talk by describing some of the background and challenges prior to having DIMA available. PJM “developed its GIS system about 10-15 years ago...in the transmission planning portion of PJM.” Mr. DiCiccio explained, “we were just using it to see the distribution of transmission lines and stations and to see where projects would be interconnecting on the system. We didn’t really need it to be super accurate in terms of geography...we would use GIS to produce presentations and reports.”

Mr. DiCiccio said, “as [the GIS system] got more visibility, it moved to an enterprise-wide solution.” He went on to highlight some of the challenges around this evolution. PJM “needed to integrate [GIS] with other data bases and information.” PJM uses the PI System as the data infrastructure; however, it was difficult to integrate “all the 1.6 million PI Tags [we] have at PJM” to see “statuses of lines, flows on lines, megawatts and various other data that we do store in the PI System” with GIS.

Mr. Kovler elaborated further by saying, “The reason we built DIMA was to improve situational awareness for dispatchers, especially during conditions that disrupt grid reliability.” “We already had data in one format or another. We have a very large ProcessBook implementation...and a pretty extensive GIS system, but” we didn’t have “an integrated version” of these data. Mr. Cline noted, “we were thinking about custom ways to deliver PI Tags to the map” before the PI Integrator for Esri ArcGIS was announced. “We would have been able to get

it done, but it was not a desirable solution. It [would] just be another thing that IT would have to maintain. Coincidentally, [the PI Integrator] was announced, and we switched gears.”

“Weather plays a significant role in the impact of the reliability of the power grid in PJM’s region,” Kovler said. For DIMA, “we started small, just taking our transmission lines and integrating weather on top as a proof of concept. It worked out pretty well, so took the next step and added more and more data to the application.” He illustrated how DIMA could overlay real-time radar, as well as weather warnings and watches, on transmission line location (see Figure 1) Shading allows dispatchers to easily identify “the actual borders” and “names of the transmission zones.” “We wanted to make this application as easy as possible to use. I didn’t want [operators] hunting and pecking for the weather data, for example, or trying to find the location of where a line is to turn that on and off.” With DIMA, “we can see this real-time status of lines” (such as online, outage-no ticket, outage-full duration, unknown) using a color-coded display.

“This is what the dispatchers have been wanting to do for a very long time.”
– Ed Kovler, Lead Solutions Architect, PJM Interconnect

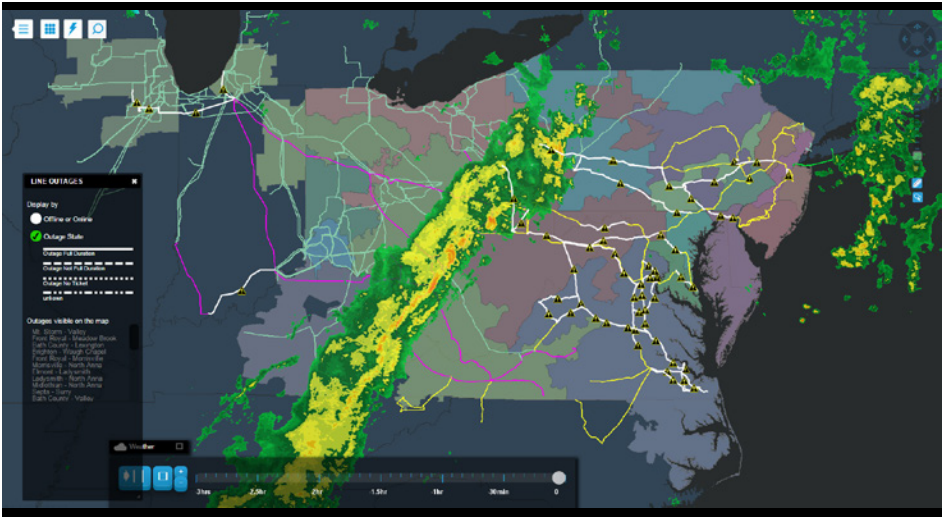


Figure 1. The Dispatch Interactive Map Application offers dispatchers visual tools for monitoring and managing the PJM transmission system, including line outages and a demand response program.

Mr. Kovler concluded that talk with future plans. “We’re just scratching the surface now. What we’d like to do in the future is integrate additional PI Data. All of our SCADA data is currently in PI, so we’d like to get all the generation data, like flow, generator status, in there as well as integrating other sources of data.”

Cline, Erich, et al. *Integration of Real-Time PI Data with PJM’s Geographic Map*, OSISOFT.COM, 29 Apr. 2015. Web. 11 August 2015 <<http://www.osisoft.com/Templates/item-abstract.aspx?id=12384>>.