

## CUSTOMER CASE STUDY

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# Visualizing grid conditions and weather in real time

PJM Interconnection® - [www.pjm.com](http://www.pjm.com)

Industry - Power and Utilities, Transmission and Distribution

## Goals

- Display real-time grid, weather and geospatial data using AVEVA™ PI System™ and ESRI ArcGIS
- Develop the Dispatch Interactive Map Application (DIMA) to display that data in one system

## Challenges

- Combine geographic and power grid data
- Display 1.6 million pieces of information

## Results

- DIMA improves situational awareness for dispatchers
- Color-coded display shows real-time status of power lines

## Solution

- AVEVA PI System

PJM Interconnection maintains grid reliability and runs energy markets across 13 states and the Washington DC area. As one of the largest transmission operators in the country, it serves 61 million people and manages 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 AVEVA PI System. Erich Cline, Software Architect, Integral GIS; Frank DiCiccio, GIS Lead; and Ed Kovler, Solutions Architect, demonstrated how DIMA works at a 2015 conference in San Francisco.

Mr. DiCiccio and Mr. Kovler opened the talk by describing the challenges they designed DIMA to solve and how they developed its geographic information system (GIS). 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.” As the GIS expanded, PJM “needed to integrate [GIS] with other databases and information.” PJM uses AVEVA PI System for its data infrastructure. It wanted to display data from its 1.6 million tags in AVEVA PI System together with geospatial data so it could better visualize flows on lines and megawatts.

Mr. Kovler explained, “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 pretty extensive GIS system,” Mr. Cline noted. But, PJM wanted a way to visualize that data in space and time.

“We were thinking about custom ways to deliver PI tags to the map. 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,” said Cline. With AVEVA PI Integrators, finally there was an easy way to integrate AVEVA PI System data with Esri ArcGIS.

“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.

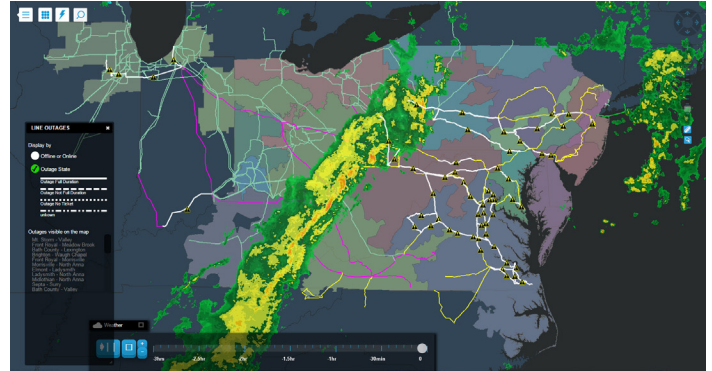


Figure 1: The Dispatch Interactive Map Application offers dispatchers visual tools for monitoring and managing the PJM transmission system, including line outages and a demand response program.

Mr. Kovler is now looking to the future. “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 integrate other sources of data.”

“This is what the dispatchers have been wanting to do for a very long time.”

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**Ed Kovler**

Lead Solutions Architect, PJM Interconnect

For more information about AVEVA’s digital solutions in transmission and distribution, visit our website: [aveva.com/en/industries/power-utilities/transmission-distribution](https://aveva.com/en/industries/power-utilities/transmission-distribution)

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