DATA LIGHTS UP THE UNIVERSITY OF MARYLAND, COLLEGE PARK CAMPUS

Around lunchtime on April 17, 2015, a massive power outage plunged the University of Maryland, College Park campus — a top-tier research facility that is home to 49,000 students, faculty and staff — into sudden darkness. The university was forced to close for several hours as the facilities management (FM) team rushed to restore steam and power to buildings.

"At that time, the only place that you could visualize our substation remotely was to actually go to our cogeneration plant control center. With that lack of visualization, we really didn't know where our problems were when we experienced that outage… it took three hours to restore power to the campus," said Don Hill, University of Maryland Assistant Director of Facilities Management in a presentation at OSIsoft's 2018 PI World conference. When the lights were finally back on, University of Maryland knew they needed a better way to gather, visualize, and analyze critical facility data.

The University of Maryland, College Park (UMCP) FM team oversees the power and conditioning of all 250 buildings on campus. They monitor the Combined Heat and Power (CHP) plant, the substation, chiller plants, and a utility distribution network with 15 miles of underground steam piping and 10 underground feeder loops.

Six months after the major outage, the FM team collaborated with the National Institute of Standards and Technology (NIST) to address systemic issues hindering real-time awareness, including an outdated system that required staff to flip through binders full of maps and CAD drawings to locate critical information about network and distribution systems and extreme notification fatigue.

Within five months of collaborating with NIST, the FM team had centralized facility data in the PI System. Hill found the PI System to be so robust that out of the 15 technologies implemented during the collaboration, the PI System was one of only two technologies UMCP decided to keep after the project ended.

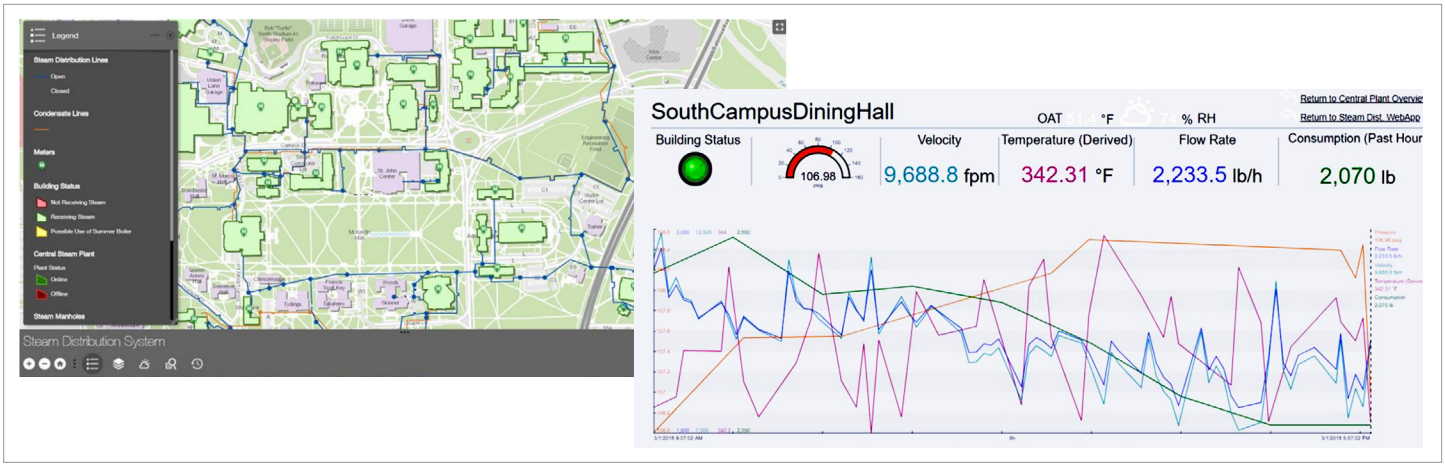
One of the team's greatest challenges was the lack of a unified view of their diverse data streams and an ability to establish connections for remote access to their CHP plant and substation. They had several legacy systems

HIGHLIGHTS:

60%
expected reduction in classroom energy usage

$1M–$3M
expected annual savings

reduced response time from
~90 minutes
to seconds



The campus buildings are visualized on an ArcGIS map with the ability to click on a building to see what is happening in real time.

running, particularly in the power plant. The PI System was able to pull in data from these legacy systems, which could then be visualized to show the power status of buildings and feeder loops so staff could monitor the operation of their steam pumps in real time.

"We have a customer response center that is manned 24 hours per day. They have screens from OSIsoft up in their command center around the clock. They can actually see what is going on around campus. Before it was getting a call from the end user… and that's not really how it is supposed to work," said Hill.

The binders full of maps and CAD drawings were transformed into digital map layers using PI Integrator for Esri ArcGIS. Users could click on buildings to drill down into PI Vision displays to see building conditions in real time on their computers or mobile devices. They also created a PI Manual Logger tour for each steam system segment so the maintenance staff could submit status updates.

To reduce the notification fatigue from false alarms and notification redundancies, the FM team clearly defined the terms of legitimate alarms and rolled up related status updates from different buildings into a single notification.

This critical combination of increased access to and intuitive visualization of data and intelligent notifications helped FM staff reduce their response time to electrical outages from up to 90 minutes to seconds. Real-time data from pumps will help them avoid mechanical room flooding, which should save up to $500,000 annually.

Consolidating and visualizing data streams also created some unexpected benefits. The FM staff will now use data to develop performance metrics for their third-party service providers and to optimize their billing system. For the first time, they can quantify the amount of money they need to spend on hidden infrastructure using PI System data.

Hill and his team discovered another exciting use for the software when they realized they could use the PI Interface for RDBMS to pull in classroom schedules and apply Asset Analytics to determine when to turn the HVAC system on or off. With their new PI System, they expect to cut classroom energy use by 60%, reduce the need for equipment maintenance, and save $1 to $3 million annually.

Watch the full 2018 PI World presentation here.

PI System™ Components Used:

PI Server™
- Data Archive
- Asset Framework
- Asset Analytics
- Notifications

PI Vision™

PI Integrator™ for Esri ArcGIS

PI Manual Logger™

PI Interfaces™ for RDBMS, BACnet, Citect, and Modbus

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— Donald Hill, Assistant Director of Engineering and Energy Facilities, UMCP

Hill, Donald. "Technology-Assisted Maintenance at the University of Maryland, College Park" <https://www.osisoft.com/Presentations/Technology-Assisted-Maintenance-at-the-University-of-Maryland--College-Park/>