



CUSTOMER CASE STUDY

Seeing inside General Atomics' paint booths with PI Vision

General Atomics
Industry - Defense and aerospace

Challenge

- Access, display, and share data to enable data-driven business decisions.

Solution

- PI Vision screens give real-time visualization of paint booth conditions. The PI System provides manufacturing engineers access to real-time and historical data trends.

Result

- Engineers and managers can monitor data from anywhere to increase production and save money.

General Atomics Aeronautical Systems, Inc. is a Department of Defense contractor and leading manufacturer of remotely piloted aircraft systems, radars, state-of-the-art ground control systems, and electro-optic solutions. But with such diversity of business activities, General Atomics was facing several data-related challenges. Sharing information and data between business units was proving unduly difficult. "We're very vertically integrated and a lot of our organizations don't know what each other are doing," said Russell Manson, Integration Automation Architect at General Atomics, during PI World San Francisco 2019.

Further, many of these organizations were hiring third-party operators to collect and sort their data offline, which could then take hours to retrieve. To address these and other challenges, General Atomics formed an internal team called the Manufacturing Center for Continuous Improvement (MCCI). With the help of the PI System™ and FogLAMP, Manson and his MCCI team soon found that they could harvest, display, and share data in an easy, intuitive way.

General Atomics' paint operations house four paint booths where aeronautical components are sent after they've been fabricated. General Atomics was using a third party contractor to collect important information about conditions inside the paint booths. Spraying can only occur when the conditions inside the booths are within a narrow temperature and humidity range. But that crucial information was only available on hard-to-read display boxes, hidden on the sides of the booths. Manson thought there must be a way to make this information more readily available. The MCCI team outfitted each spray booth with two Raspberry Pis, temperature probes, and humidity sensors. They also attached 55" monitors to the outside of each booth.

The team now also uses FogLAMP to collect data from the Raspberry Pis and move it into the PI System. From there, PI Vision displays deliver real-time visual feedback about temperature and humidity conditions inside the booths. With these displays, booth operators can easily read the status of each booth – even from across the room! Asset Framework (AF), a contextualization layer of the PI System, enabled engineers to configure and track multi-state events such as temperature and humidity conditions.

With the PI System, this information about booth conditions can be collected across time and compared to coating quality standards to ensure standards are being met. "I didn't have to write a single piece of code to do this. It's bittersweet. I like to code but man, [PI Vision] is really cool because there are a lot of default features there that are just ready to be displayed," Manson said. The web-based displays provide immediate visual feedback about booth conditions, allowing operators to spray sooner, which increases production speed.

Lately, General Atomics has been working toward implementing Event Frames so that operators can be alerted via text or email when a booth is ready or when conditions are outside of the acceptable range. "We want to be able to take full advantage of the Event Frames so that we're sure we're within specifications," Manson explained.

With the PI System, other people in the company also have access to real-time and historical data, and they can now analyze data that was not previously available. "Manufacturing engineers can view trends from anywhere in the company at any time," Manson said. "They can also do their own analysis to compare temperature readings between paint booths to justify insulation or cooling," he said.

"Here PI Cloud Connect is a perfect tool for us that we can utilize. It's a simple yet safe solution, which is not difficult at all."

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Csaba Galambos

Process Automation Engineer at MOL



PI Vision displays with color-coded alarms help to monitor temperature and humidity in real time inside the paint booths for drones.

Having actionable data of the sort made available by the PI System helps companies like General Atomics make sound business decisions. “We want to show ‘hey, in paint booth number two, it’s taking you twice as long to heat up after spray operations. And maybe it’s taking three times as long to cool down.’

Those are production delays. How much are we spending to heat up a paint booth because we don’t have insulated walls? I’m really excited to be able to drill into this information and show some returns on investment,” Manson said.

MCCI’s success with the paint booths has inspired other data projects throughout the company as well. People passing by from other General Atomics organizations have noticed the new PI Vision displays and were impressed.

“These people said, ‘Wow, what are you guys doing here? We want that!’ So this project has generated a list of opportunities. We’re starting initiatives around machine connectivity, data collection from all of our CNC and shop floor machines, and the various communication protocols,” Manson said.

For more information about General Atomics and the PI System, [watch the full presentation here.](#)