



SUMMARY

Flowserve®

Industry

Manufacturing

Business Value

- IoT
- Remote Performance Monitoring
- Collaborative Data Ecosystem
- Industrial Aftermarket Service Provider
- Connected Services
- Original Equipment Manufacturer

PI System™ Components

- PI Server™
 - Data Archive
 - Asset Framework
 - Asset Analytics
 - Notifications
- PI OLEDB™
- PI WebParts™
- PI ProcessBook™

OSIsoft's Connected Services Enables Flowserve's Global Rotating Equipment Monitoring Solutions

Manufacturers worldwide are launching strategies to integrate digital intelligence into industrial equipment to improve uptime, prevent accidents, and help the bottom line. Worldwide, process industries lose \$20 billion dollars due to unplanned downtime and faulty maintenance practices and approximately 80% of these losses could be stopped with early, accessible, information.

At the 2015 and 2016 OSIsoft EMEA Users Conferences, Josh Lyon and Greg Herr, Senior Manager of Emerging Technologies and General Manager of Operations of Flowserve; Ian Fountain of National Instruments; and Enrique Herrera of OSIsoft presented how Flowserve, a global manufacturer of pumps and other equipment, has leveraged OSIsoft's Connected Services to drive equipment reliability and performance through global active monitoring solutions. With wireless IoT technology and the PI System, Flowserve engineers can leverage their expertise to monitor "real-time equipment data, KPIs, and analytics at customer sites." Flowserve also demonstrated how augmented reality will assist technicians to more quickly pinpoint and fix potential problems.

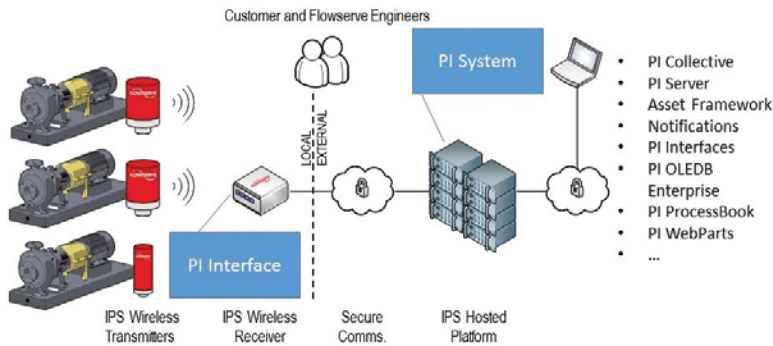
Mr. Lyon described some market trends and that are stimulating change for OEMs. He cited studies that state that, "there are only 2 billion devices connected today", but "by 2020, an estimated 26 billion devices around the globe will be connected." Furthermore, "3 out of 4 companies are exploring how to use the Industrial Internet of Things (IIoT), or Industry 4.0, [not only] to improve their internal operations but also to improve their services." Mr. Herr went on to say, "IIoT is changing our markets...whether we do or not. We need to make sure that we are staying ahead and changing with it."

For the rest of the talk, Mr. Lyon and Mr. Herr described the technical aspects enabling their solutions, examples of how their solutions have benefitted their customers and some lessons learned as Flowserve has "evolved [toward] more monitoring, reliability services, field services, and training."

Mr. Lyon described the technology behind their service offerings. First, he states, "the Industrial Internet of Things isn't something you just buy. It is... partnering with companies...to strategically [build] your IIoT platform" and asking things like, "how can I get information from assets in the field to a central location where my engineers can look at [it] to provide value to themselves, to customers? How can I do that so that it is scalable? How can I do that where it is cost-effective? And now that I have that data, what do I do with it?"

At the edge, Flowserve's "IPS Wireless products...[capture] things like pressure, temperature, vibration and transmit data wirelessly back to an IPS Wireless Receiver. From the IPS Receiver, we aggregate data at the site and then transmit it up to Flowserve's IPS Hosted Platform. At the Hosted Platform, Flowserve and customer engineers are collaborating with one another" to solve performance, maintenance, and reliability challenges. Mr. Lyon added,

"how does OSIsoft fit into this? At the IPS Wireless Receiver level, we have a PI Interface which is collecting data...and securely communicating it up to the PI System [and] to our hosted platform." Together, Flowserve and OSIsoft technology enables Flowserve engineers to apply expertise to real-time data to create actionable information for their customers.



“IIoT is changing our markets. We are staying ahead...and changing with it to supply services and solutions for our customers.”

- Greg Herr, GM Operations

Mr. Lyon described an example where their services helped a customer avoid catastrophic failure. "One customer had come to us to instrument their equipment to collect things like vibration, temperature, and pressure. [When] they needed to do planned maintenance, we saw vibration levels drop [during] maintenance, which is completely normal. When they brought the equipment back online, the vibration levels actually jumped but in a bad direction. We called up the customer and said, "hey, we think something is going on here. Can you take a look at this piece of equipment?" They did and [saw] that a foreign object had been dropped into [the equipment] and was stuck in a suction strainer. They were able to pull it out and bring the equipment back online. The customer said that if they had let this go, it would have resulted in a potential catastrophic failure [and] 10-14 days of downtime - a significant impact in terms of process, [costing] around \$650,000."

Flowserve has also begun to experiment with integrating virtual reality and augmented reality into its offerings. In the demonstration involving Flowserve, PTC, National Instruments and OSIsoft, Ian Fountain of National Instruments showed how real-time data is ordinarily only available on dashboards could be represented virtually on a job site. When a technician points a smartphone or tablet camera at a device, the relevant data streams for temperature, pressure, or potential failures are overlaid onto the image to help the technician find and fix the problem much quicker.

The technician can also pull up 3D CAD renderings of the device for an exploded view of the internal design.

To summarize, Mr. Lyon asked, "What does this all mean for us? We have been doing this for several years now." He added that, "we have heard from our customers that they want more from us. They want the reliability, they want the throughput." Flowserve has leveraged sensor technology and worked with OSIsoft to become "a better reliability partner for customers." Finally, he stated that, "technology is an enabler. It has allowed us to be more responsive, more adaptive, more intelligent. We continue do it because it is a win-win for both Flowserve and our customers."

Lyon, Josh and Greg Herr. *OSIsoft's Connected Services enables Global Rotating Equipment Monitoring*. OSIsoft.com, Oct. 2015. Web. 11 November 2015. <<http://www.osisoft.com/Templates/item-abstract.aspx?id=12794>>.

Lyon, Joshua, et al. *Keynote - Unleash your Infrastructure with the PI System*. OSIsoft.com, 27 Sep. 2016. Web. 21 October 2016. <<http://www.osisoft.com/Presentations/Keynote---Unleash-your-Infrastructure-with-the-PI-System/>>.