



Arizona Public Service Company's Use of IT Monitor

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Company



About Arizona Public Service Co.

APS is the regulated distribution subsidiary of Pinnacle West Capital Corporation. We are the State's largest electric utility, providing reliable power with quality service at a reasonable cost for over 118 years. We serve over 1,200,000 customers in 11 of 15 counties in Arizona.

About Arizona Public Service Co.

APS has a Generation mix consisting of Nuclear, Coal, Gas, Solar and Wind generation.

APS and Our History With PI

- PI was selected as our corporate standard data historian in 2001.
- We now have PI used throughout our Generation fleet.
 - We use IT Monitor, RT Alerts, PI ACE and Highly available PI.

APS and IT Monitor

While IT Monitor is utilized at Palo Verde, Four Corners, West Phoenix, Red Hawk and Cholla This presentation will deal with the use of IT Monitor at the Cholla Power plant. Located in North East Arizona.



APS and IT Monitor

When we purchased our first IT Monitor system we were licensed on a per point basis. We will be upgrading to the new licensing model which is based on a per device basis. This will help us to capture more data without worrying about the point count.



IT Monitor Package Components

Component	IT Monitor Package		
	Basic	Advanced	Professional
PI Server	Enterprise	Enterprise	Enterprise
IT Organizer and IT Overview	Yes	Yes	Yes
Template Packages	Yes	Yes	Yes
RtAlerts	Yes	Yes	Yes
Advanced Computation Engine	No*	Yes	Yes
Ping, SNMP, TCP Response, Windows Performance Monitor data collection	Yes	Yes	Yes
IP Flow, Packet Capture, Syslog, Windows Mgt Instrumentation, Windows Event Log, SNMP Trap, RDBMS data collection	No	Yes	Yes
Traceroute, Cisco IP Phone, Data Access Package, Universal File Loader, Batch File, XML and HTML data collection	No	No	Yes

The Challenge

- Pre September 11th 2001
 - ▶ Process Control Network and Business Network were closely coupled with no real security between the two.
 - The goal of that time was to seamlessly integrate the two networks so that data could be used to make business decisions.
 - The process data was available via the internet to distant users that were part of the decision making process.

The Challenge Cont.

- Post September 11th 2001
 - ▶ NERC (North American Electric Reliability Corporation) starts process to define Cyber Security Rules for utilities. NERC 1200 UAS (NERC 1200 Urgent Action Cyber Security Standard)
 - ▶ While the rules were being refined APS started an internal assessment of our Process Control Networks and the associated security.
 - An internal Cyber Security Team was established.
 - Deficiencies were identified
 - Capital projects were put in place to separate the Process Control Networks from the Business Networks.

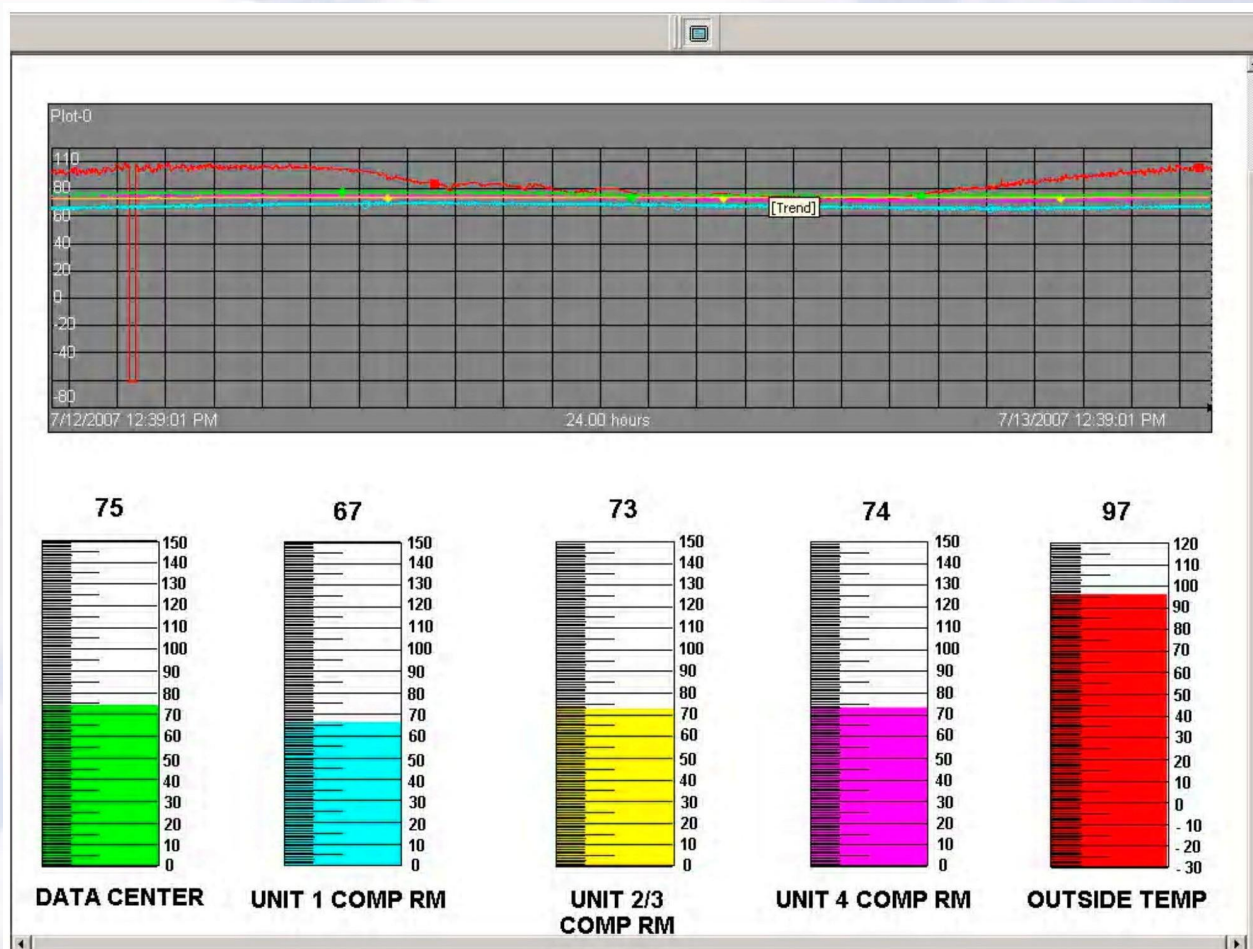
The Challenge Cont.

- The Process Control Networks were Isolated from the Business Networks
 - ▶ Monitoring of the Process Networks was no longer available from our centralized Corporate IS due to the separation.
 - A cost effective monitoring tool was needed.
 - The monitoring tool would have to reside behind the firewall and send data to the business network without compromising the firewall rules.
 - ▶ Data that was available for business decision making was now restricted to the local process networks.
 - Process data would have to be presented to the business network without compromising the firewall rules.

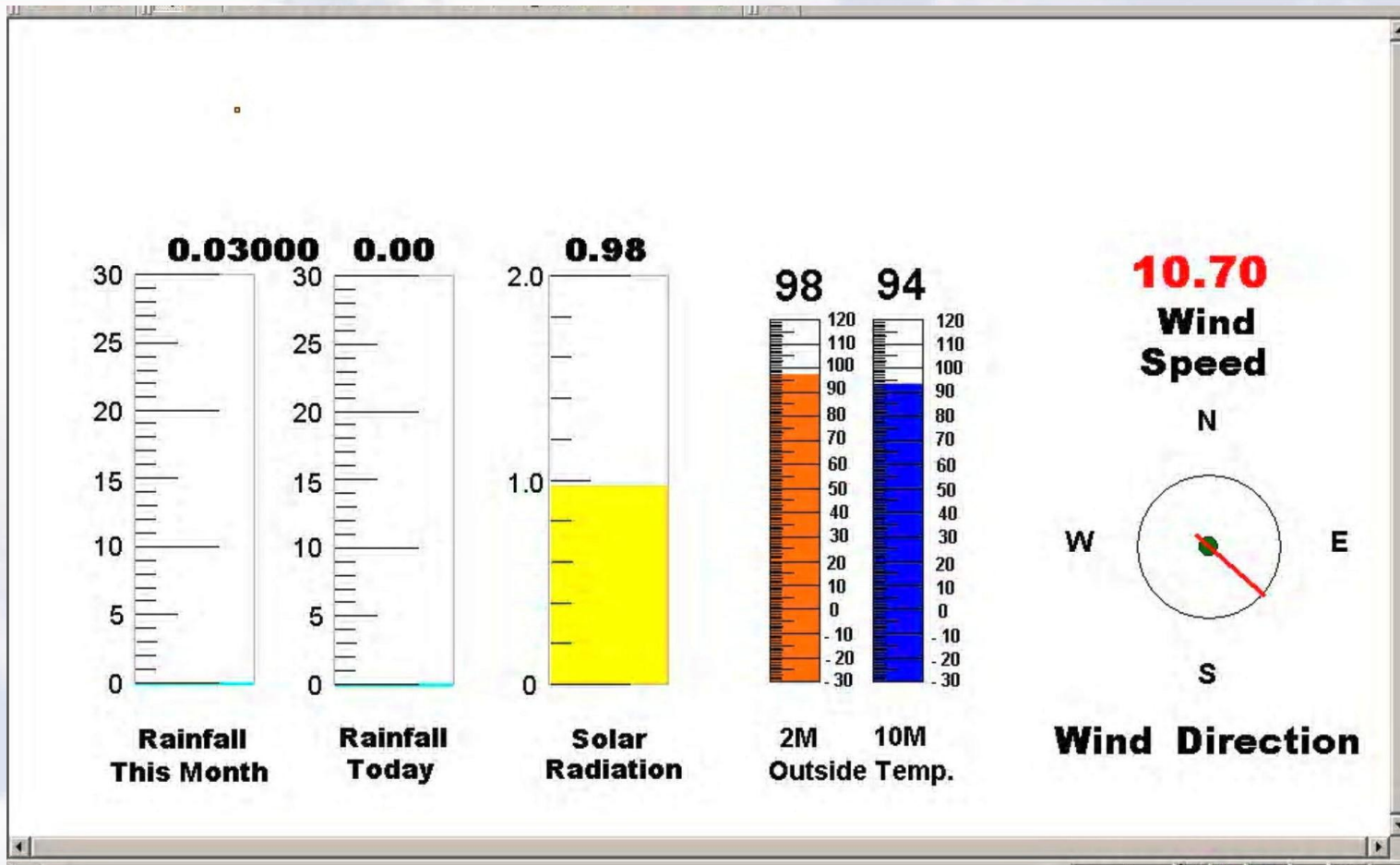
The Solution

- While investigating PI as a solution to our challenge of presenting process data to the Business Network. OSIsoft introduced us to a new tool called IT Monitor.
 - ▶ IT Monitor was evaluated along with other tools and selected for the following reasons.
 - Improved Security.
 - No need to install software on each device being monitored.
 - History.
 - We were already familiar with PI.
 - The ability to look at more than just IT assets such as temperature, humidity, and other environmental conditions.

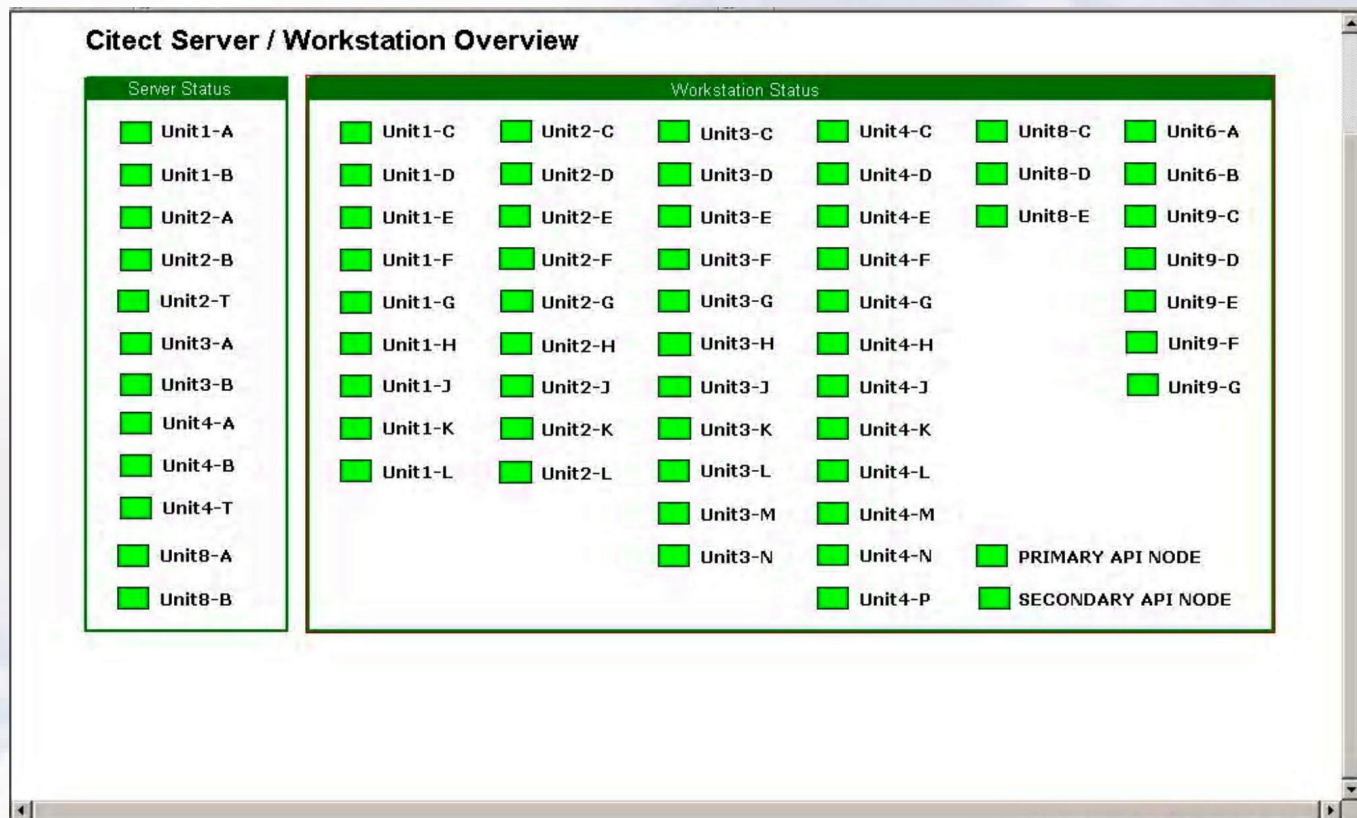
Server Room Environmental Data




Weather Data



Process Control Computers





Printer Data




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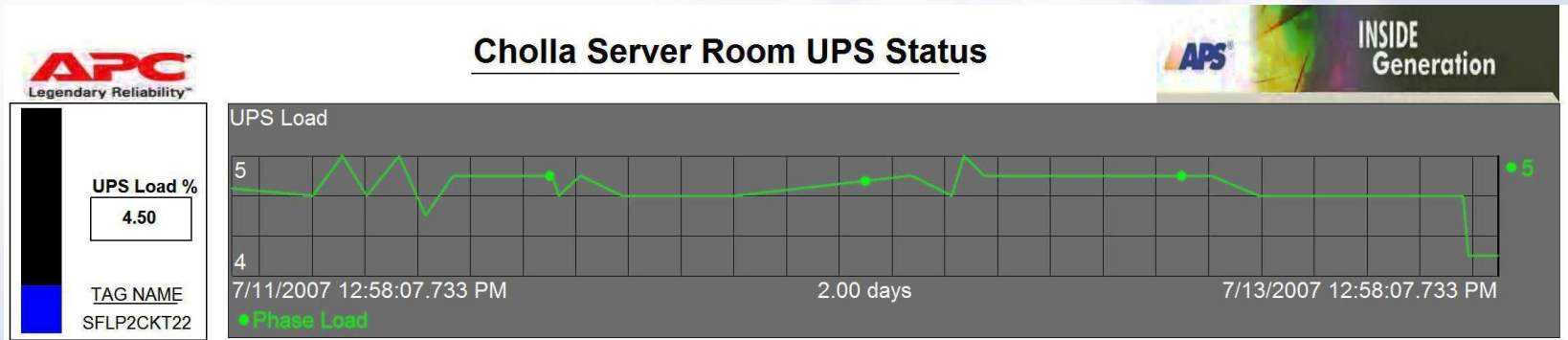
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UPS Status Data



Resulting Benefits

- We have many positive results since installing IT Monitor.
 - ▶ Forecasting of resources
 - We use the trended data to forecast and budget for hardware and software upgrades. This is a three year long range forecast and next year budgeting.
 - Such as disk space requirements.
 - CPU and memory requirements.

Resulting Benefits

- Forecasting of resources

- ▶ Capital project to install Single Mode Fiber throughout the plant and upgrade network switches.
 - By showing capacity of the network and load with hard trends we were able to sell the fact that a network upgrade and infrastructure upgrade was needed before any additional systems were added to the process network.

Resulting Benefits

- IT Monitor is used for conflict resolution when working with vendors to get bugs fixed.
 - ▶ Operator Interface upgrade bug.

Resulting Benefits Cont.

- IT Monitor is used for troubleshooting problems, especially effective when history is needed
 - ▶ Operator Print screen case.

Resulting Benefits Cont.

- IT Monitor cost savings

- ▶ 25% saved on process control server and workstation lease.
- ▶ Eliminated hidden component failures of redundant network.
- ▶ IT Monitor will meet the reporting requirements of NERC CIP (Critical Infrastructure Protection standards) without additional software cost. Thus having avoided cost savings associated.
 - CIP 5 Electronic Security Perimeters.
 - CIP 7 System Security management.
 - CIP 8 Incident reporting and response.

The Future

- Continued development to comply with NERC/FERC requirements.
- Integrate physical security with cyber security.
 - ▶ The ability to bring physical security information such as Card reader data and camera data for incident investigations.

The Future

- IT Monitor will be used on the Business Network.
 - ▶ A test case is being built now to prove the value of IT Monitor for the entire enterprise and not just the process control network.
 - Palo Verde Nuclear Generating station and Cholla Power plant are involved in this business case.
 - The case will show the value of seeing the whole picture and not just individual pieces such as only the network or only servers.

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You***

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