



OSIsoft[®]

UC2010

Real Time Information — Currency of the New Decade

Hilton San Francisco Union Square | San Francisco, CA

April 26-28, 2010

OSIsoft®

UC 2010



PI Software Usage

Scott Minter, Director, IT

Mitsubishi Power Systems Americas, Inc.



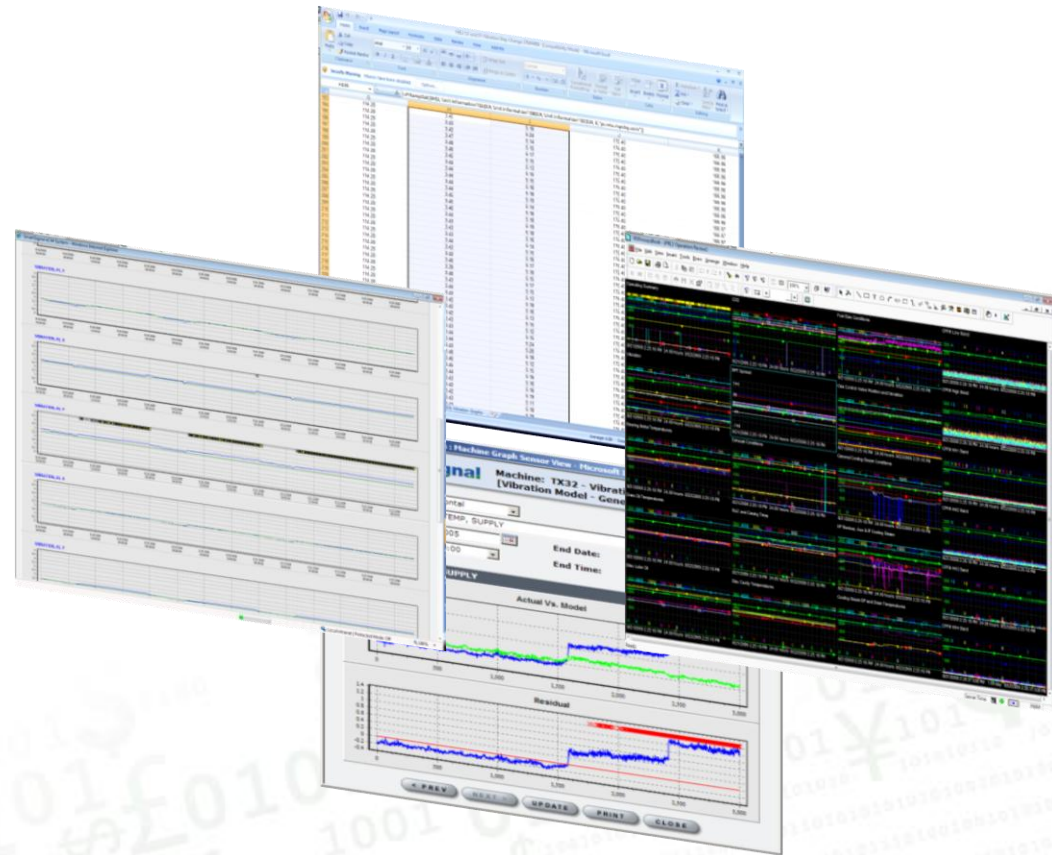
- Power Generation Services
- Power Industry
- International Company
- Provider of Remote Monitoring Service for our LTSA Customers

What our Remote Monitoring Center Does

- Provides assistance to our customers in optimizing power plant performance, efficiency, operation and Long Term Service Agreement (LTSA) management.
- Monitors over 50,000 data tags of our customer's operational parameters remotely from Orlando, FL.
- Monitors the tags in 1-3 second increments (approximately 1.5GB of data per day)
- Support day to day plant operations.
- Provides data analysis and evaluation to improve customer's overall unit performance.
- Provide a web portal for information sharing with our customers using SharePoint.

OSIsoft SOFTWARE AND SERVICES USED

- PI Historian in high availability mode
- PI ProcessBook
- PI Ace
- PI WebParts
- PI Datalink
- SmartSignal



PI Historian

- Helps us capture data, process it.
- The result is Information.

Why HA mode? Hurricanes.

Reliability. 24 Hour operations. Upgrades. (currently 2 nodes)

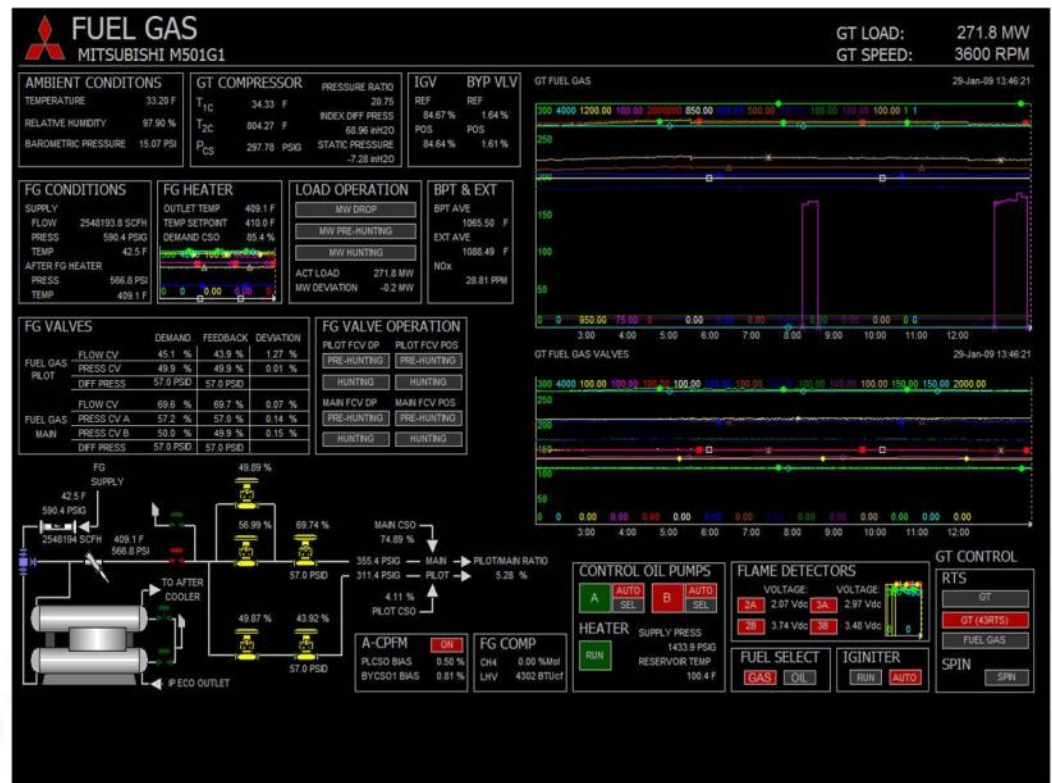
On-Site Monitor (OSM)



PI ProcessBook

Gives our Remote Monitoring Center (RMC) staff the ability to quickly build data trends that aid in the RMC troubleshooting and presentation efforts.

Uses the Information from PI. The RMC expert adds perception to gain Knowledge.



PI ACE

Create unit performance tags to evaluate the past and present operating performance with an advanced analytical data processing and computing program.

This allows us to assist and recommend maintenance such as water washing to improve operational efficiency.

Once again we are taking the Information captured by PI and adding perception to create Knowledge.

'HR Calculation

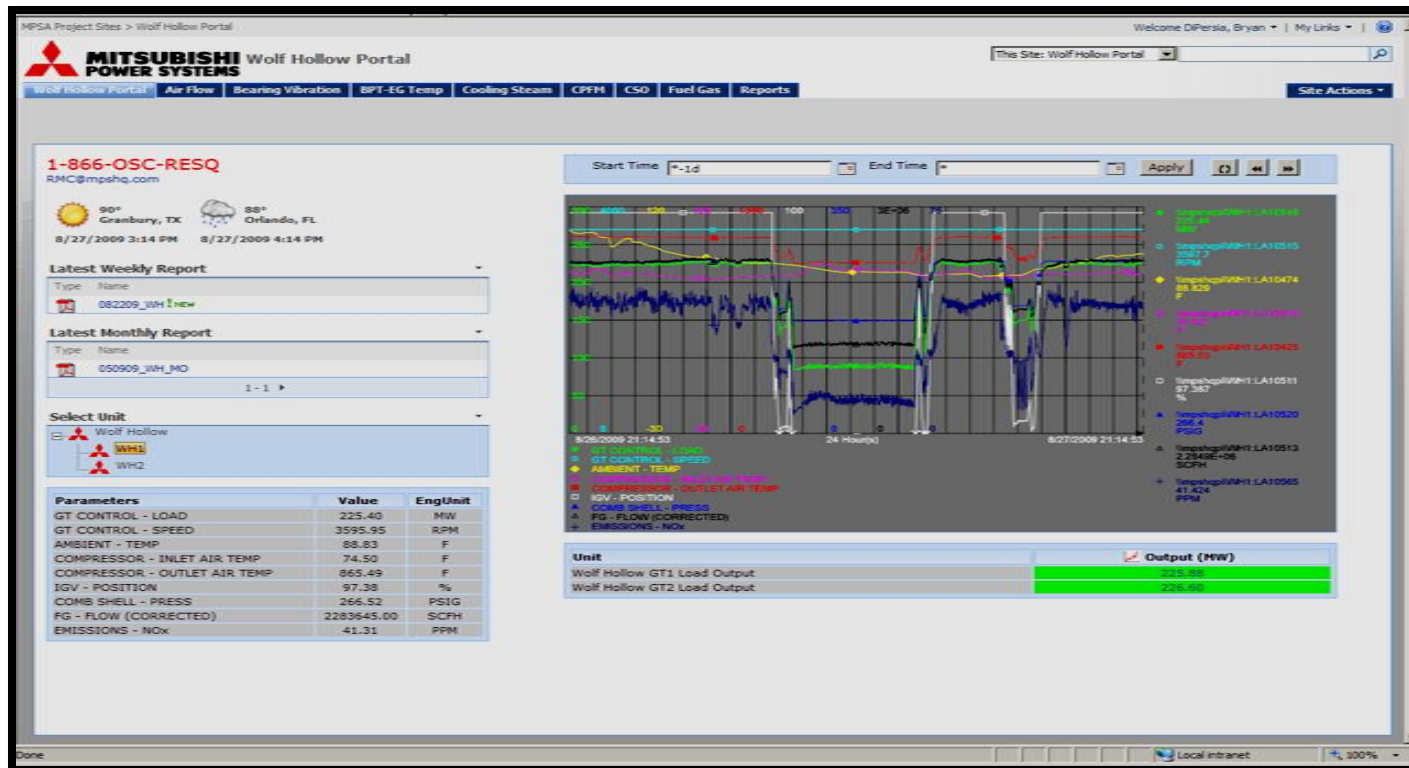
```
1 _HR = (FGFlow / LHV) * load  
1 _HRSL = 1 _HR / HRT1C / HRPAMB / HRIGV / HRT1T  
1 _HRSE = 1 _HRSL / SETamb / SEPamb / SEigv  
.....
```

CE Calculation

```
PresRatio = (combshellP + ambP) / ambP  
T2Cc = (PresRatio ^ ((kTavg - 1) / kTavg)) * T1CK  
1 _CE = ((T2Cc - T1CK) / (T2CK - T1CK)) * 100  
1 _CESE = 1 _CE / kT1C / kIGV  
1 _CEIGV = 1 _CESE * elevation
```


PI WebParts

PI WebParts are utilized in a portal fashion to allow secure convenient access for our customers from any place in the world (given Internet access). Our goal is to enable visibility to Information with our customers and enable better communication and collaboration.



PI Data Link

- We needed further examination of the data captured with PI for additional trending, filtering, reporting, and comparative analysis.

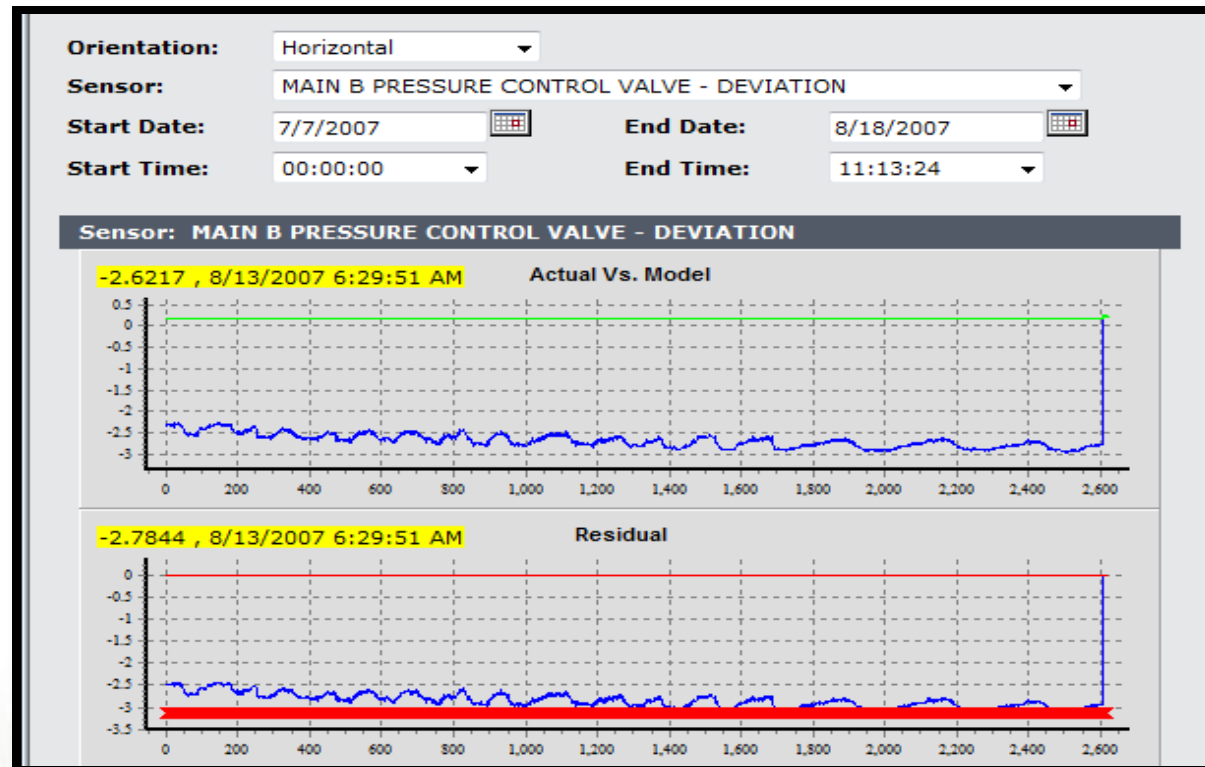
- We export the data to Excel.

- This allows us to take the Information from PI and view it with a different tool. Perception is added to gain Knowledge

	C	D	E	F	G	H	I	J	K	L
		TX31-1a10202	TX31-LA10210	TX31-LA10251	TX31-LA10260	TX31-LA10230	TX31-LA10239	TX31-LA10266	TX31-LA10300	T
		GT CONTROL - LOAD	COMPRESSOR - INLET AIR TEMP	CSO - REFERENCE, INGV (IGVREF)	CSO - REFERENCE, VALVE, BYPASS (BYREF)	CSO - CONTROL, GT (CSO)	CSO - FG PILOT (MFPLCSO)	FG - RATIO, PILOT	BPT - TEMP, #12	BP
2										
3	07-Mar-04 23:45:00	0.01	26.27	0.00	100.00	-5.00	0.00	0.00	58.41	
4	07-Mar-04 23:45:02	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.43	
5	07-Mar-04 23:45:04	-0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.34	
6	07-Mar-04 23:45:06	0.01	26.27	0.00	100.00	-5.00	0.00	0.00	58.39	
7	07-Mar-04 23:45:08	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.44	
8	07-Mar-04 23:45:10	0.00	26.27	0.00	100.00	-5.00	0.00	0.00	58.48	
9	07-Mar-04 23:45:12	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.43	
10	07-Mar-04 23:45:14	0.04	26.28	0.00	100.00	-5.00	0.00	0.00	58.43	
11	07-Mar-04 23:45:16	0.04	26.27	0.00	100.00	-5.00	0.00	0.00	58.44	
12	07-Mar-04 23:45:18	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.42	
13	07-Mar-04 23:45:20	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.43	
14	07-Mar-04 23:45:22	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.41	
15	07-Mar-04 23:45:24	0.00	26.27	0.00	100.00	-5.00	0.00	0.00	58.38	
16	07-Mar-04 23:45:26	0.00	26.27	0.00	100.00	-5.00	0.00	0.00	58.39	
17	07-Mar-04 23:45:28	0.00	26.27	0.00	100.00	-5.00	0.00	0.00	58.41	
18	07-Mar-04 23:45:30	0.01	26.26	0.00	100.00	-5.00	0.00	0.00	58.44	
19	07-Mar-04 23:45:32	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.45	
20	07-Mar-04 23:45:34	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.39	
21	07-Mar-04 23:45:36	0.01	26.26	0.00	100.00	-5.00	0.00	0.00	58.40	
22	07-Mar-04 23:45:38	0.01	26.26	0.00	100.00	-5.00	0.00	0.00	58.41	
23	07-Mar-04 23:45:40	0.02	26.26	0.00	100.00	-5.00	0.00	0.00	58.42	
24	07-Mar-04 23:45:42	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.43	
25	07-Mar-04 23:45:44	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.43	
26	07-Mar-04 23:45:46	0.00	26.27	0.00	100.00	-5.00	0.00	0.00	58.43	
27	07-Mar-04 23:45:48	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.44	
28	07-Mar-04 23:45:50	0.01	26.27	0.00	100.00	-5.00	0.00	0.00	58.45	
29	07-Mar-04 23:45:52	-0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.46	
30	07-Mar-04 23:45:54	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.49	
31	07-Mar-04 23:45:56	0.01	26.27	0.00	100.00	-5.00	0.00	0.00	58.47	
32	07-Mar-04 23:45:58	0.01	26.27	0.00	100.00	-5.00	0.00	0.00	58.46	
33	07-Mar-04 23:46:00	0.02	26.26	0.00	100.00	-5.00	0.00	0.00	58.47	
34	07-Mar-04 23:46:02	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.51	
35	07-Mar-04 23:46:04	0.01	26.27	0.00	100.00	-5.00	0.00	0.00	58.48	
36	07-Mar-04 23:46:06	0.00	26.27	0.00	100.00	-5.00	0.00	0.00	58.46	
37	07-Mar-04 23:46:08	0.00	26.27	0.00	100.00	-5.00	0.00	0.00	58.44	
38	07-Mar-04 23:46:10	0.00	26.27	0.00	100.00	-5.00	0.00	0.00	58.43	
39	07-Mar-04 23:46:12	0.01	26.26	0.00	100.00	-5.00	0.00	0.00	58.47	
40	07-Mar-04 23:46:14	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.47	
41	07-Mar-04 23:46:16	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.38	
42	07-Mar-04 23:46:18	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.45	
43	07-Mar-04 23:46:20	0.02	26.27	0.00	100.00	-5.00	0.00	0.00	58.51	
44	07-Mar-04 23:46:22	0.03	26.27	0.00	100.00	-5.00	0.00	0.00	58.49	

SmartSignal

- Turbines are expensive.
- Using SmartSignal together with PI we are able to correlate the data gathered and provide predictive analysis of failures or other conditions.
- This information is very useful for our customers.



Summary

- *Mitsubishi Power Systems Americas, Inc.* has created a world class Remote Monitoring Service in Orlando, FL to assist our customers and support Long Term Service Agreements.
- PI software is the foundational piece of technology utilized
- The PI software helps us take Data from Gas Turbine controllers and process the Data to capture Information.
- PI tools allow us to take the Information we gained and add perception. We then have Knowledge that will support our customer's operations and our own.
- Finally, if we can take that Knowledge and make a judgment we arrive at Understanding.

CHALLENGE / PROBLEM DETAILS

- Reliable data continuously at high availability
- Various Control Systems throughout the industry.
- High resolution data for accurate troubleshooting.
- Long term data storage.

SOLUTION

- PI Historian in high availability mode.
- Flexible PI interface solutions.
- 1 to 3 second data resolution.
- Data stored redundantly in PI archives.

PI SYSTEM ARCHITECTURE

- Central PI server in Data Center (HA) for daily work, trending, display, history aggregation, SmartSignal integration, WebParts, etc.
- MPLS connecting the Data Center to remote power plants
- PI Server at remote power plants for fault tolerance
- PI to PI and proprietary programs for communication
- Firewalls, networking equipment in OSM
- Servers in OSM

PI SYSTEM COMMUNICATIONS

- PI Server at Remote Sites.
 - Connections via different interfaces
 - PI to PI.
 - Batch file.

TANGIBLE BENEFITS

- Reduces unexpected downtime.
- Performance & Reliability Improvements.
- One unit trip avoided is less than remote monitoring service cost annually.

INTANGIBLE BENEFITS

- Engineering Research & Development for equipment improvement.
- Great industry reputation.
- Reliable information.

FUTURE PLANS / NEXT STEPS

- Expanded plant coverage (monitoring more data.
- Further automation, other engineering tools utilizing PI.
- Possible Wind Turbine monitoring



OSIsoft®

UC 2010

Real Time Information — Currency of the New Decade

Questions?

© Copyright 2010 OSIsoft, LLC., 777 Davis St., San Leandro, CA 94577



OSIsoft®

UC2010

Real Time Information — Currency of the New Decade

Thank you

© Copyright 2010 OSIsoft, LLC., 777 Davis St., San Leandro, CA 94577