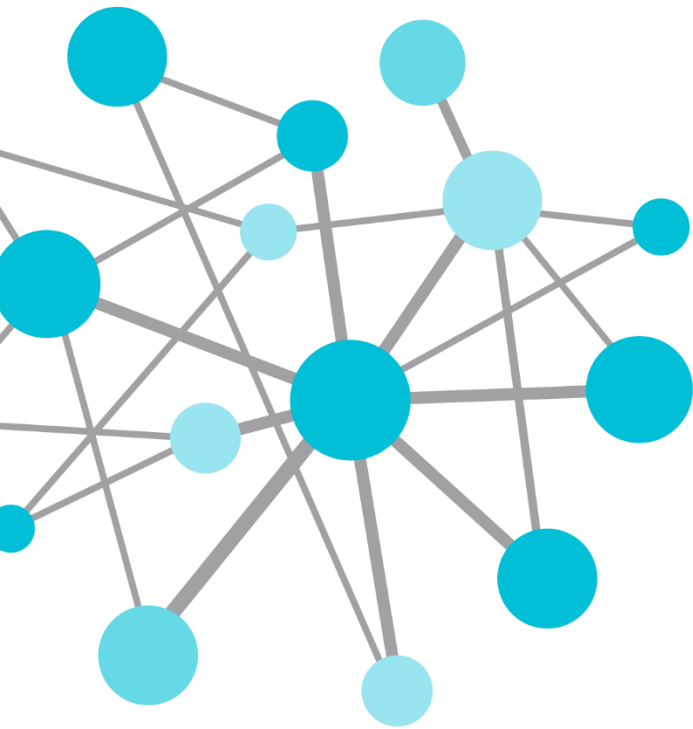


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REGIONAL SEMINAR 2014

The **Power** of **Data**

DECISION READY IN REAL-TIME



Managing a very large PI System

Presented by **Narendra Raju, Principal Operations Systems Analyst**

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MISO Overview



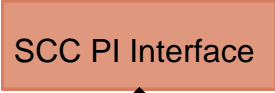
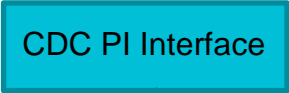
MARKET AREA



RELIABILITY COORDINATION AREA

- Not-for-profit, member based organization administering wholesale electricity markets.
- Generation Capacity
 - 175,436 MW (Market)
 - 200,906 MW (Reliability)
- Historic Peak Load (set July 20, 2011)
 - 126,337 MW (Market)
 - 132,893 MW (Reliability)
- 65,787 miles of transmission
 - 500kV, 345kV, 230kV, 161kV,
138kV, 120kV, 115kV, 69kV
- 15 states (Reliability)
- One Canadian province

MISO PI System



PI System Details

- **700,000** PI Tags system
- 2 GB data archives (PI Archives) every 13 hours
- **Five High Availability** PI Data Archive Servers
- Eight PI Interface Servers – PI Interface for ESCA HABConnect
- **Four PI Advanced Computing Engine** (PI ACE) Servers
- Two PI WebParts Servers
- PI Clients: PI ProcessBook, PI DataLink, PI Webparts, PI OLEDB

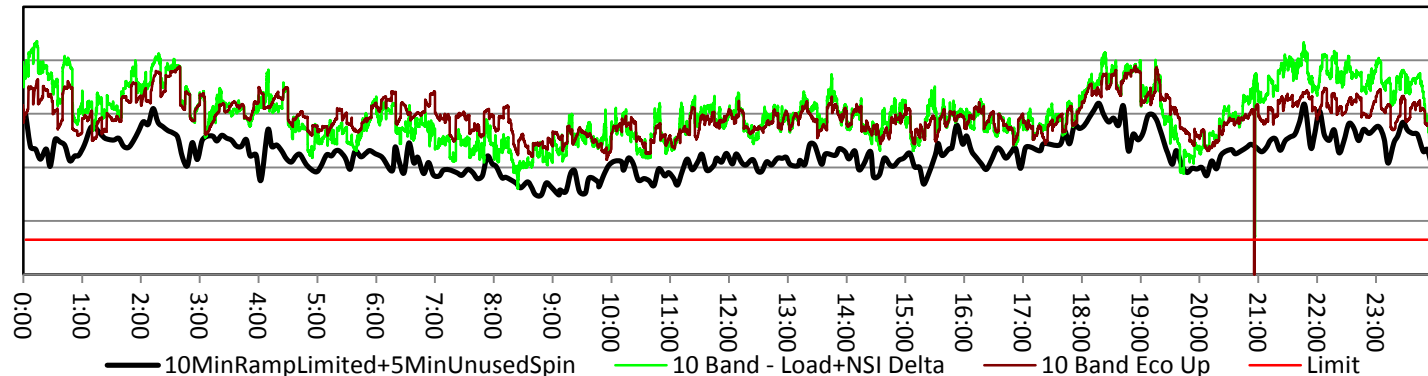
PI Data Usage: Performance Metrics

Process to monitor and improve reliability of the electric system using PI data ensuring the efficient, most economic use of generation and transmission assets.

Some categories:

- Control Performance,
- Spinning Reserve,
- Regulation Deployment, ...

Spinning Reserve



PI Data Usage

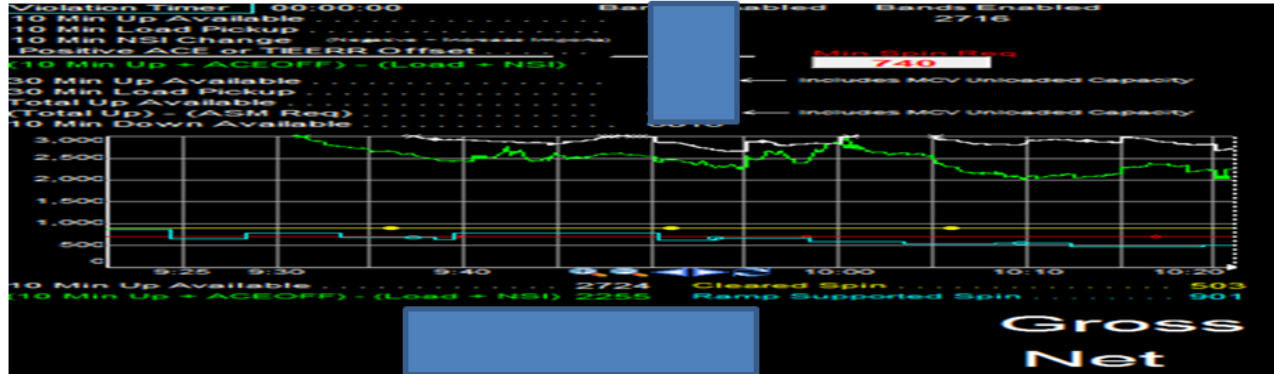
NERC Compliance Data

Using PI data in Real-time and historical analysis to compliance with NERC Standards for
Disturbance Control Standards (DCS) Performance
Control Performance Standard (CPS) Performance
Balancing Authority ACE Limit (BAAL) Performance

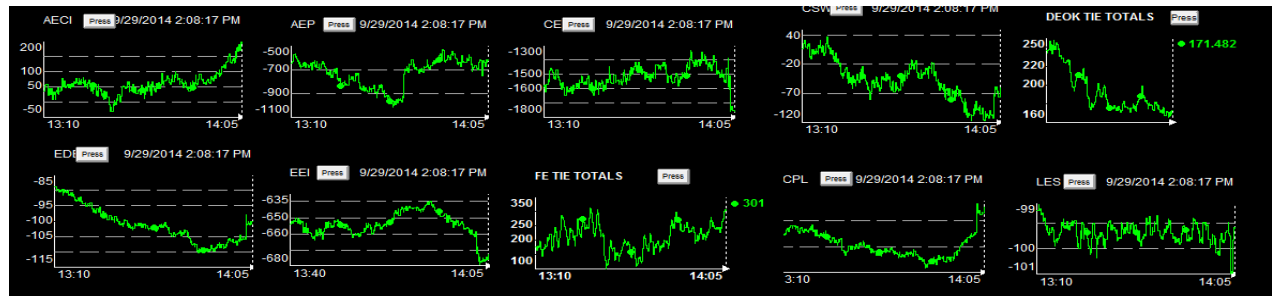


PI Data Usage

Real Time Balancing Authority Generation and Tie Line Monitoring



Tieline data & monitoring

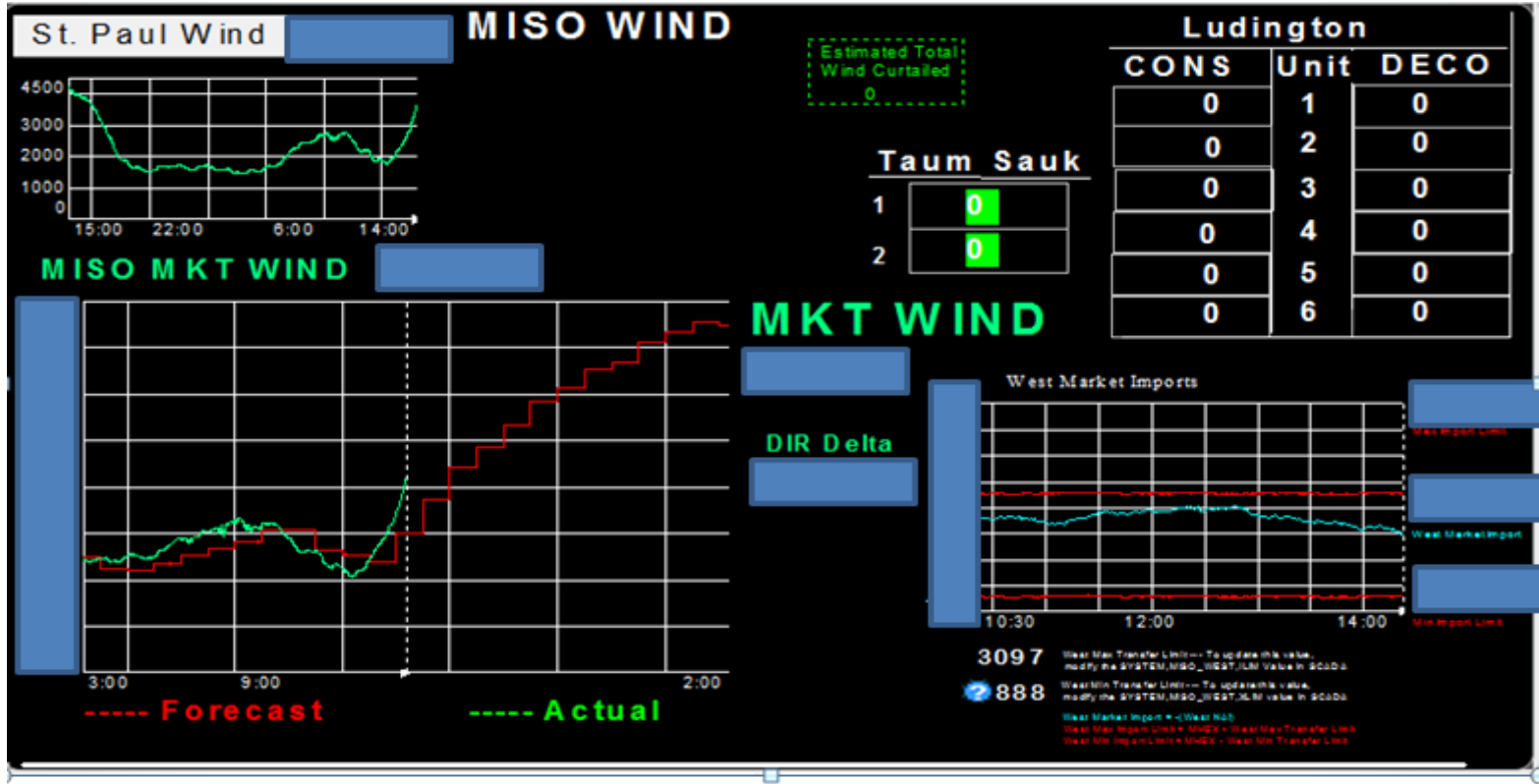


PI Data Usage

EMS Data Trending and Historical Analysis and EMS Oncall Support



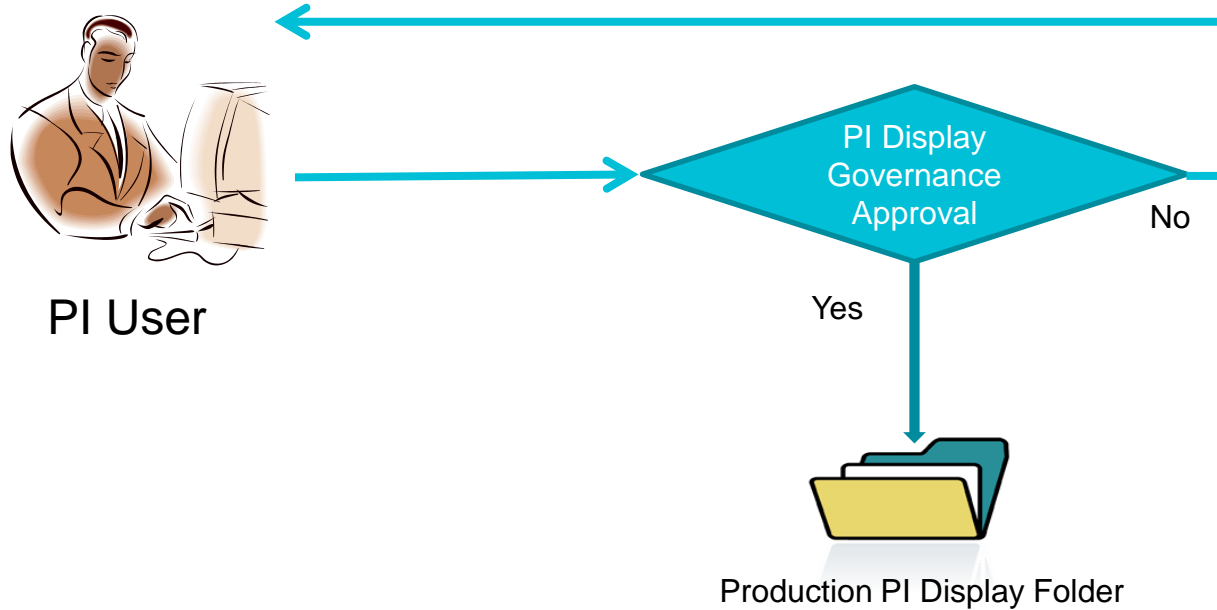
PI Data Usage



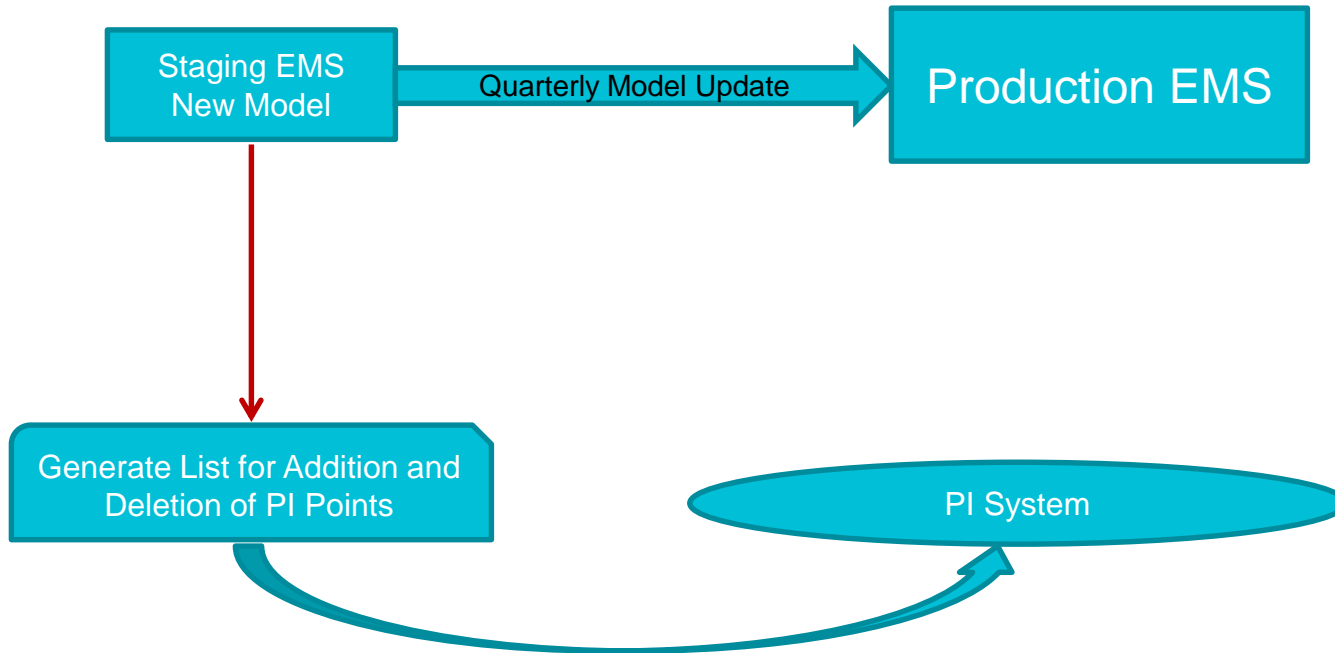
Managing PI System

- PI Display Management
- PI Point Update
- Offline Storage of PI Archive Data
- PI Software and Operating System Upgrade
- PI System Failover

PI Display Management



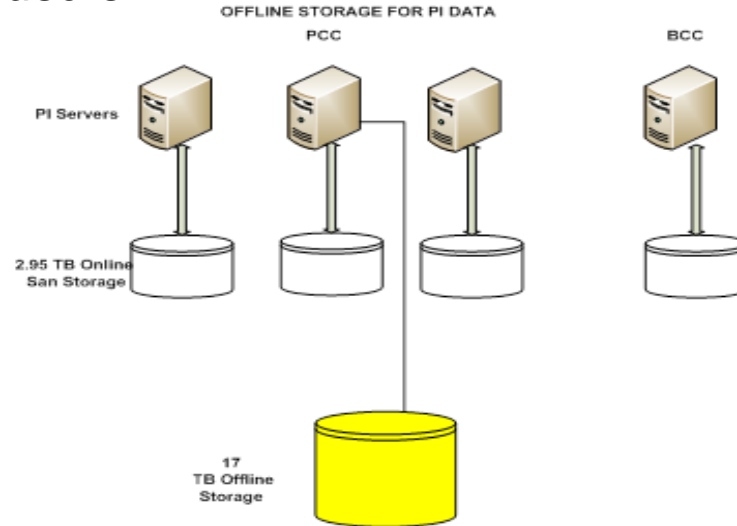
PI Point Update



Using PI Tag Configurator export PI point update list

Offline Storage

Miso implemented off-line storage of PI System data by moving out PI Data Archive files (older than two years) to offline, un-replicated, mid-tier, less expensive storage. The PI system host two years of on-line data for PI System users.

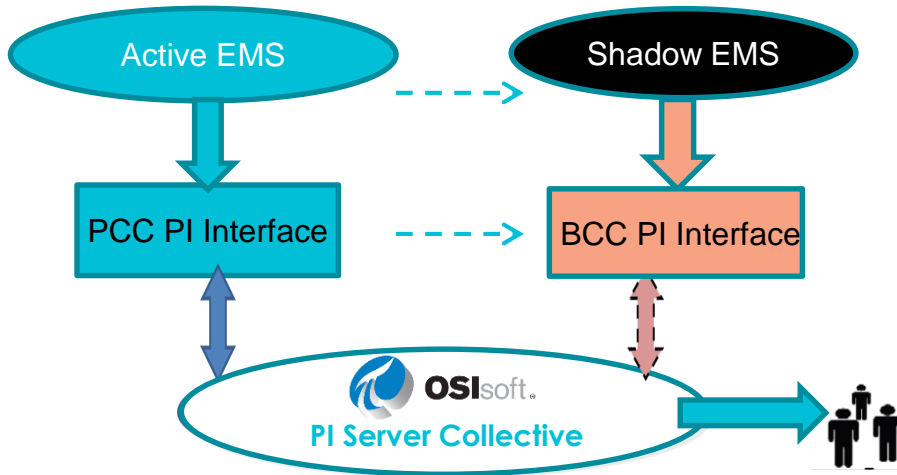


PI Software Upgrade

- PI System servers are upgraded every two years
- Any emergency patch or update will be implemented
- PI System Servers are patched twice a year
- PI System user accounts are managed by Active Directory

PI System Failover

PI interfaces switchover between PCC and BCC sites executed using a script.



Conclusion

The PI System is important to Real -Time Operations for managing key aspects of grid reliability and integrating market data with EMS data and operator friendly interface.

“While the PI System up time is better than 99%, our PI System Administrators are able to respond and correct issues within minutes and often correct any issues prior to Operations noticing a problem”

Questions

Please wait for the microphone before asking your question



Please state your name
and your company

Contact info

Narendra Raju

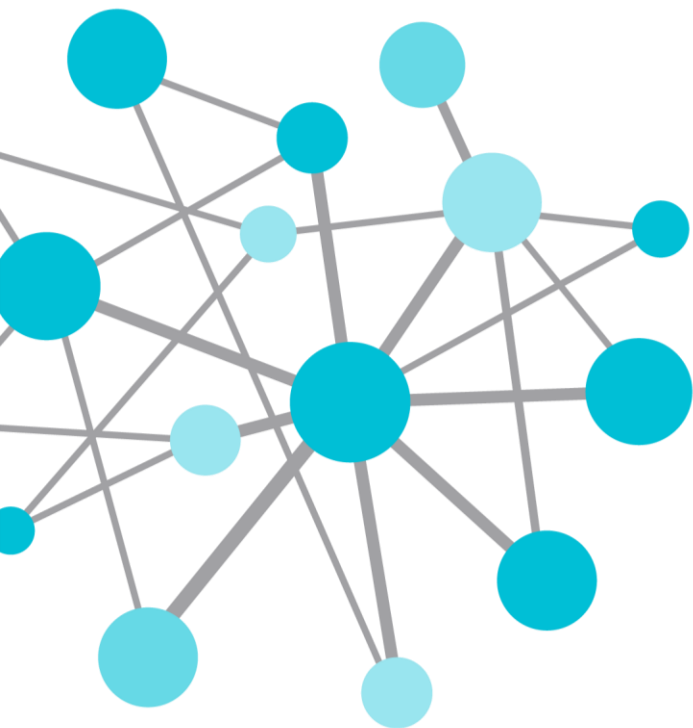
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THANK
YOU

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