

Midwest ISO PI Implementation

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Midwest ISO Overview

- Independent
- Non-profit
- 2001 - Reliability Coordinator
- 2005 - Energy Markets
- 2009 – Ancillary Services Market
- Large Footprint



Scope of Operations

- Generation Capacity
 - 131,306 MW (market)
 - 159,000 MW (reliability)
- Peak Load (set July 31st, 2006)
 - 116,030 MW (market)
 - 136,520 MW (reliability)
- 93,600 miles of transmission
- 13 states, 1 Canadian province
- 750,000 square miles

Scope of Operations

- 5-minute dispatch
- 1,896 pricing nodes
- 5,464 generating units in the network model
- ~ \$3.5 billion per month settled in energy markets
- 300 market participants serving 40+ million people

Who We Are

- Independent, non-profit organization responsible for maintaining reliable transmission of power in 15 states and one Canadian province
- First Regional Transmission Organization (RTO) approved by the Federal Energy Regulatory Commission (FERC)
- Midwest ISO is a service company that provides reliability to the electric grid
- Midwest ISO administers the market for electricity producers and users on a wholesale level
- Midwest ISO does not generate or buy electricity

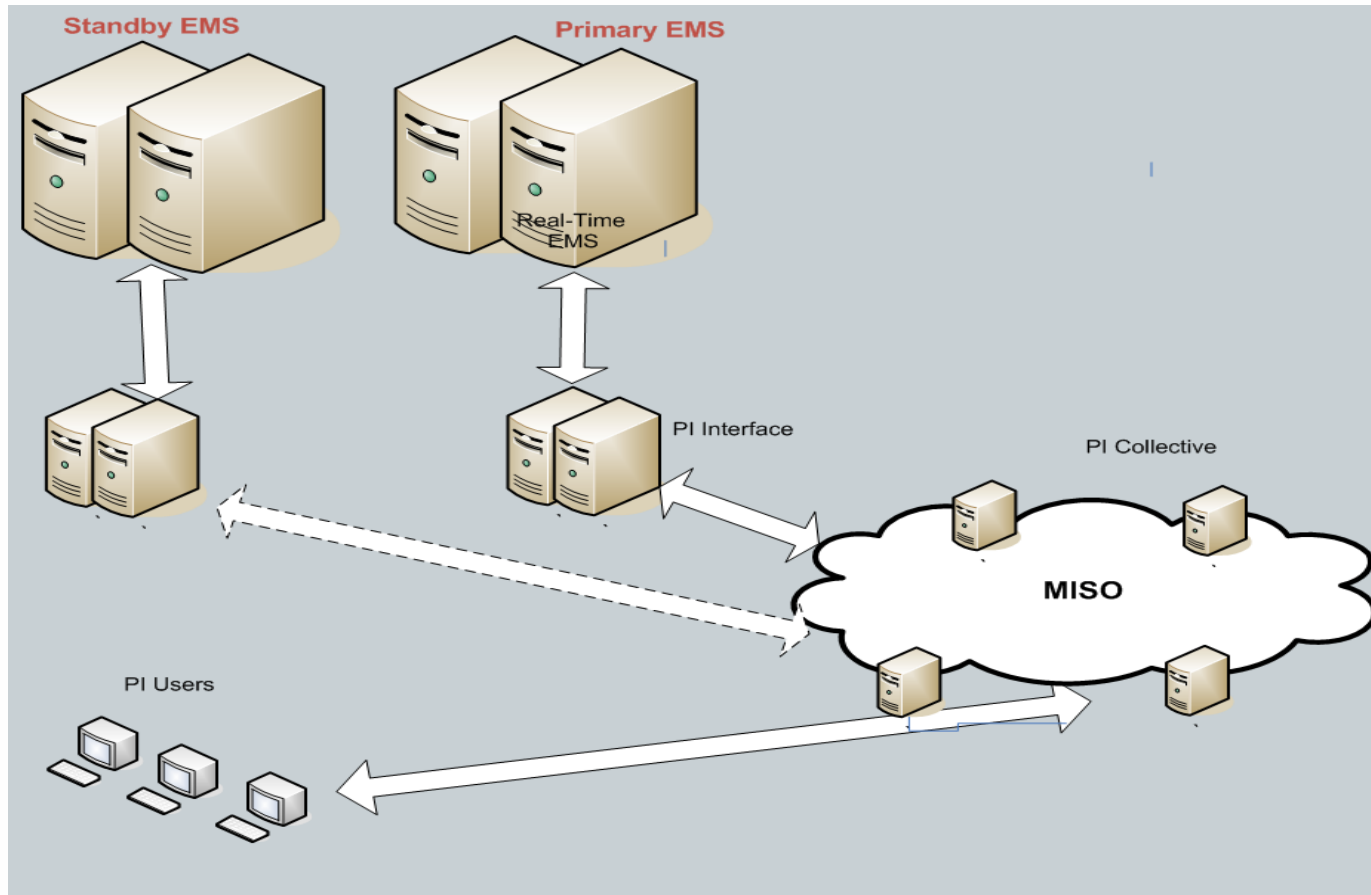
Mini PI

- 50,000 Point Mini PI Test System
 - Installed 2005
 - Two years archiving data without a server reboot

PI Installation

- Purchased November 2007; Installed February 2008
- 5 Server High Availability Collective
 - 500,000 Tags
 - Interfaces for AREVA HabConnect, Batchfile, Universal File Loader
- 125 License RT WebParts
- 50 License ProcessBook and DataLink

MISO PI Collective



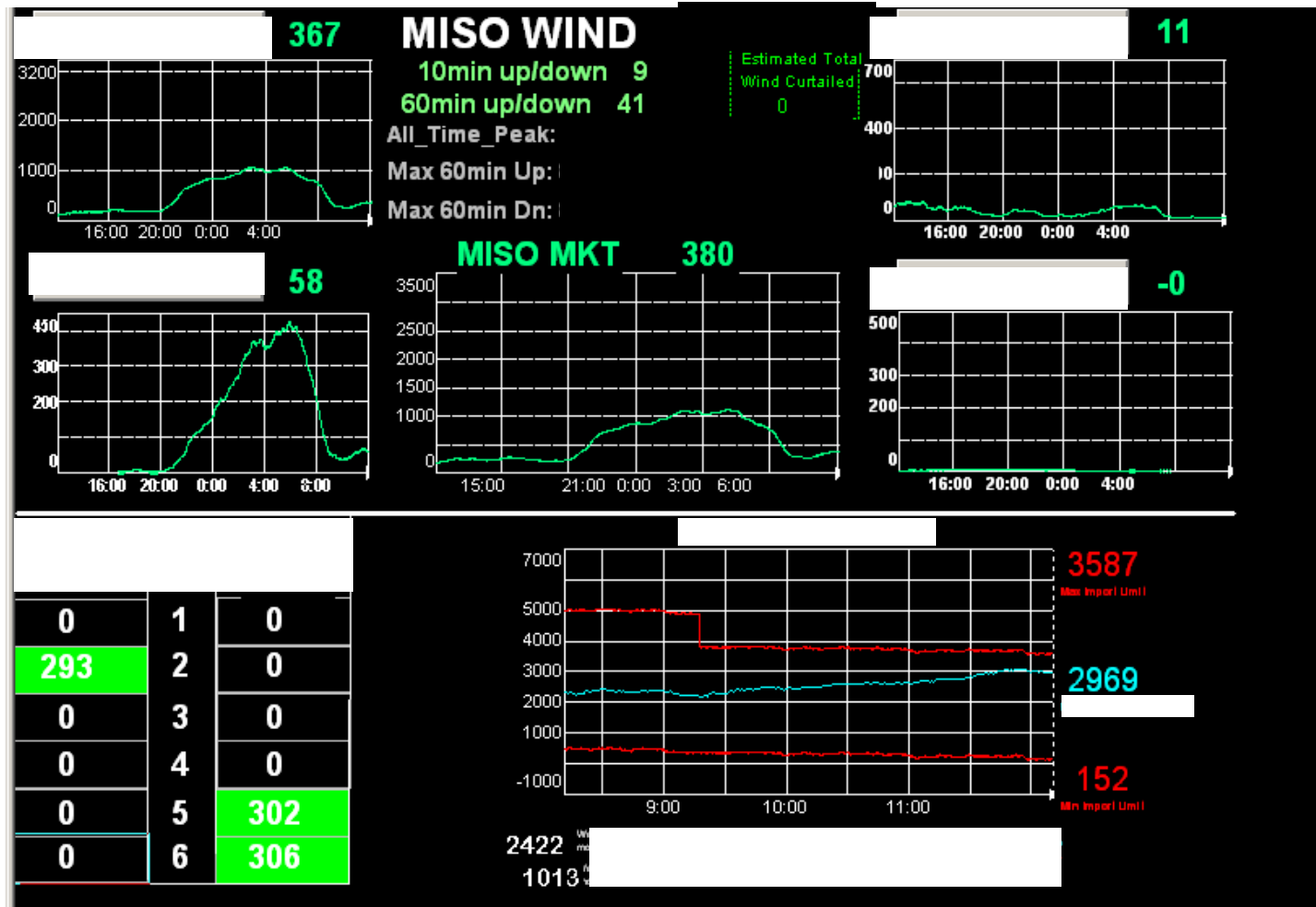
Decision to Move to PI Platform

- Industry Recommendations
- Mini PI Experience
- Ease of Use
- Stable Platform
- Expandable

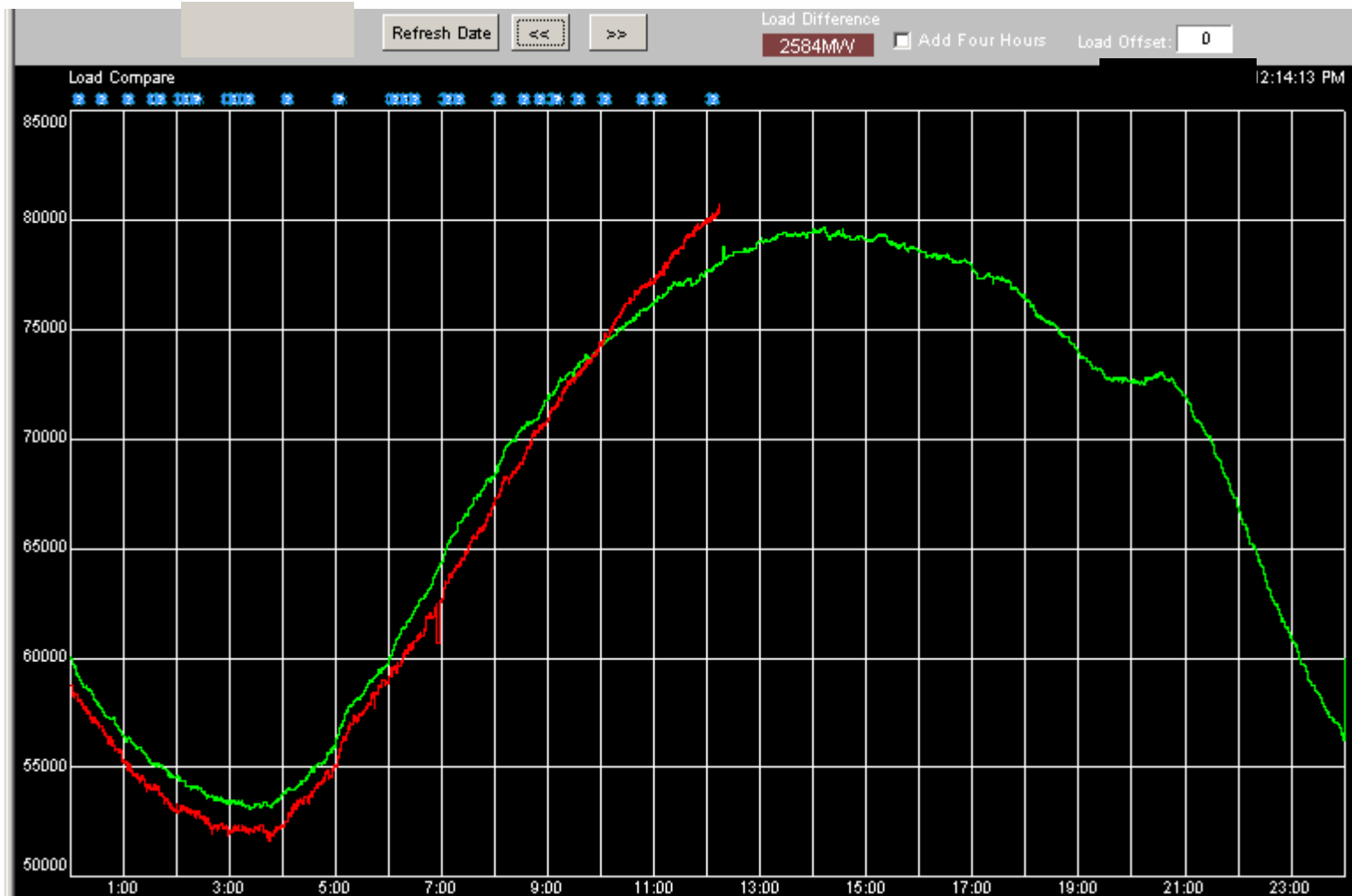
Key Operational use

- Monitor Transmission Flow
- Track Generation and Load
- Monitor Operating Reserve
- Monitor ACE and Frequency
- Monitor Tie Line Flows Across Boundaries
- Manage Procedures

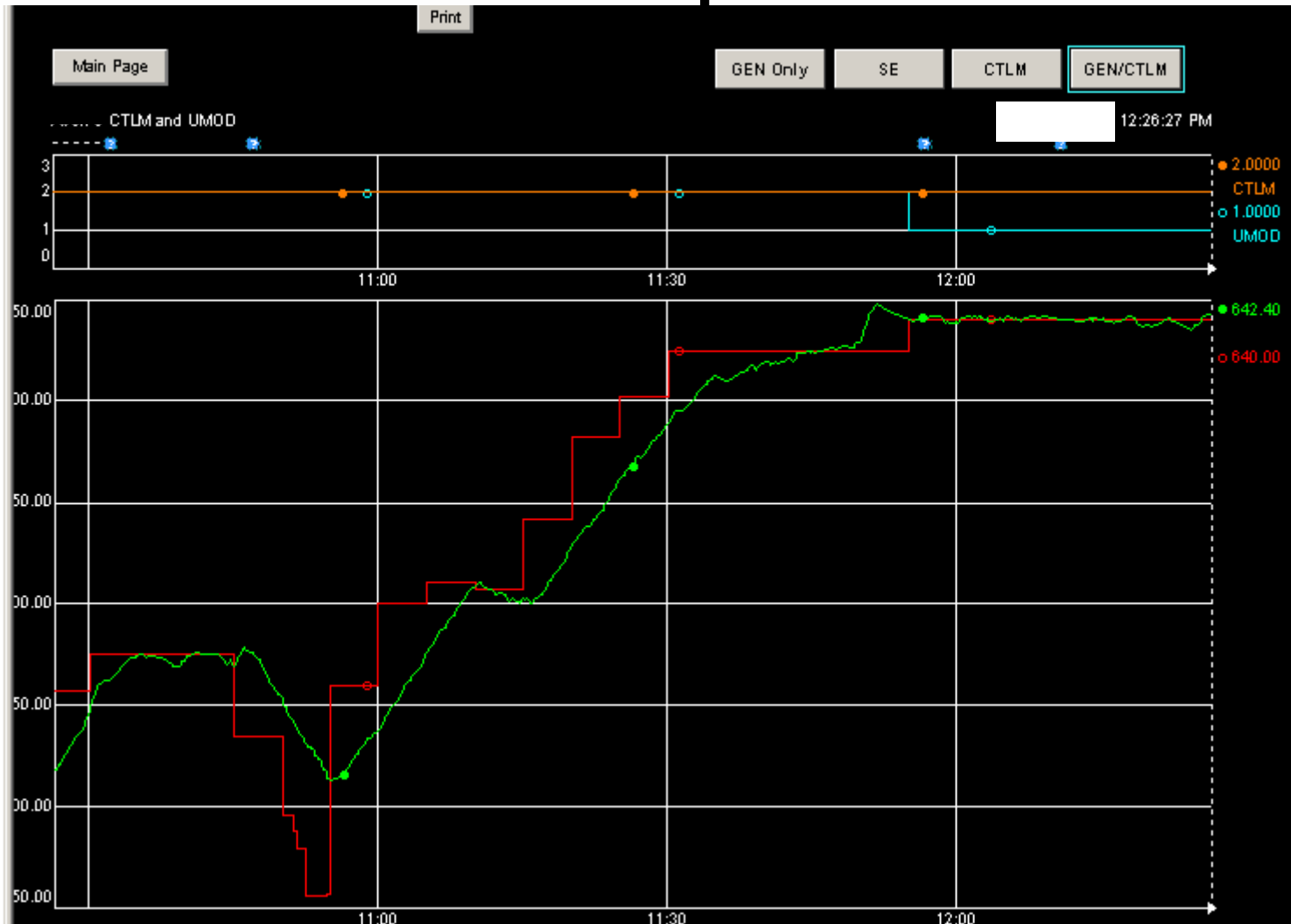
Wind Generation



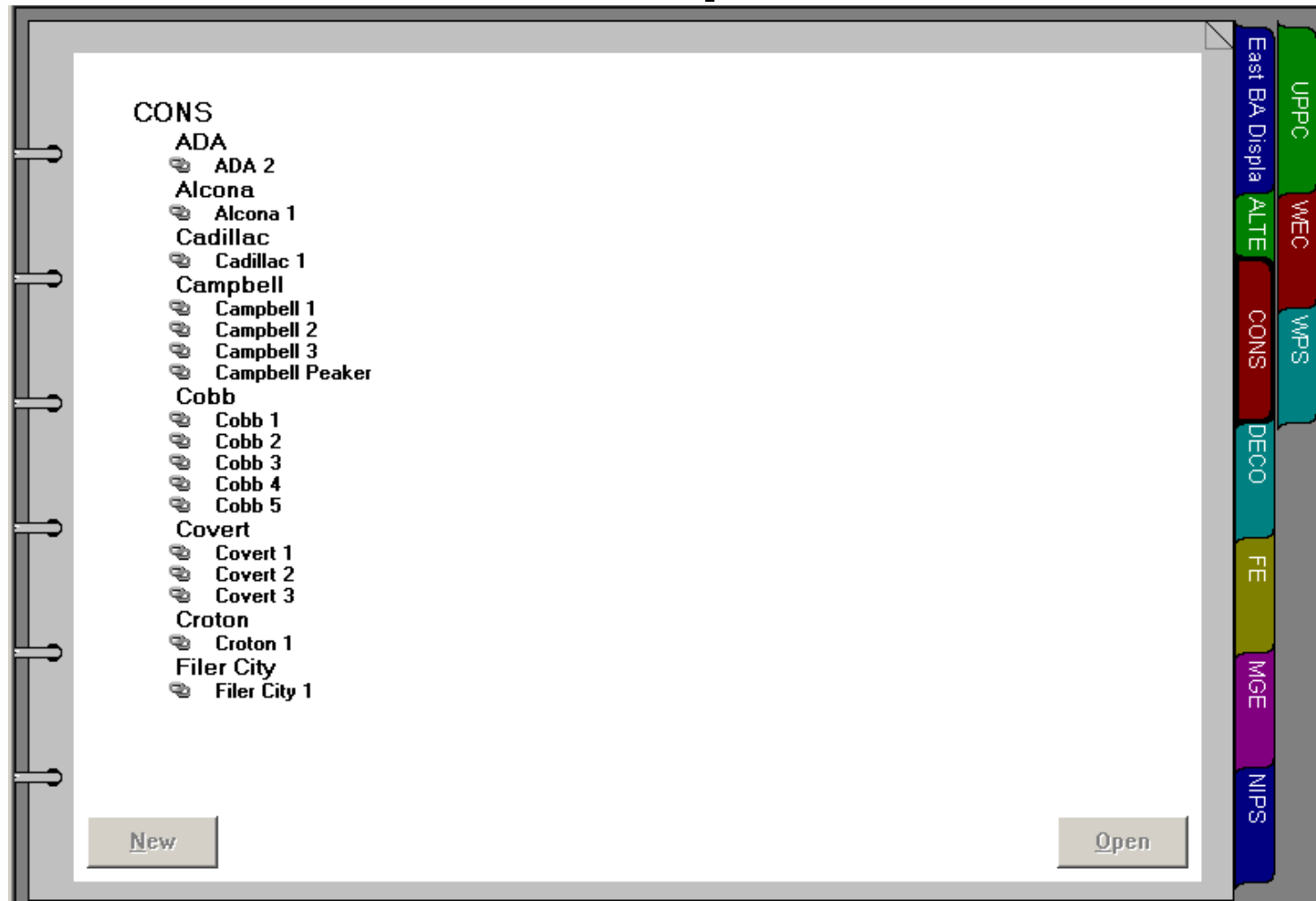
Load Comparison



Generation Dispatcher Data



Generation Dispatcher Data



MISO PI Use

- Over 140 Displays built to date
- FERC Display Data
 - Hosted on Sharepoint
- PI Display Governance
- Daily Scorecard Data
- Imbedded DART DB Query
 - Performance maintained
- Over 250 PI Users at MISO
- Tier Zero Application

MISO Future Plans for PI

- ACE Server
 - Conversion of Excel Based Tools
- Load Forecasting Application
- Data Center and Facility Monitoring
- Potential use in Synchrophasor Project
 - Pending Economic Stimulus Funding
- Enterprise Agreement Negotiations

Questions?

- Questions/Comments
- Contact Information