AVEVA™ PI System™ for Western Energy Imbalance Market

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AGENDA

WEIM Introduction And Challenge

PI Integration and Technical Architecture

Solution

- EIM Asset Framework
- EIM Displays
- EIM Analysis

Future Opportunity and Improvements
Western Energy Imbalance Market

Introduction

• The Western Energy Imbalance Market (WEIM) is a real-time wholesale energy trading market that enables participants anywhere in the west to buy and sell energy.

• Reduces production costs by balances fluctuations in supply and demand by using lower-cost resources to meet real-time power needs.

• Allows for more efficient use and integration of renewable energy.

• Currently 22 entities

• 4.2 Billion gross benefits since Nov 2014
Why the AVEVA PI System?

• WEIM introduces the need to manage a tremendous amount of data quickly and efficiently
  • Pre-hour submissions
    • Unit availability
    • Resource Plan
    • Bilateral Sales/Purchases
    • Bids
  • Real-time telemetry from SCADA to CAISO
  • Real-time market inputs into EMS
  • Real-time market adjustments
  • Post Analysis Data

• One common challenge nearly all WEIM entities encounter is providing real-time visualization and decision-making tools to ad operators in decision making
Systems

CAISO
- BAOOP (Operations Portal)
- BSAP (Base Schedules)
- ADS (Dispatches)
- webOMS (CAISO OMS)
- SIBR (Bids)

EESC (BA)
- EMS (OSII/AspenTech Monarch)
- webEIM (EESC)
- webTrans
- webAccounting
- OATI DMZ (SQL Server Data Warehouse)

PRSC (Marketing)
- webEIM (PRSC)
- webTrader
- webOMS (TEP OMS)
- webCalc

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Asset Framework Design

- Create a standard Asset Framework, for participation in WEIM, that contains all/most of the standard parameters common among all WEIM entities
- Able to integrate into the business processes/practices of updating CAISO resource templates to ensure that operational display are in sync with the market
- Allows flexibility between the static elements, while also allowing dynamic elements to evolve as needed
GRDT And IRDT As Foundation
Custom Data Elements

- Dispatch Operating Target (DOT)
  - Generation
  - Dynamic ETSR’s
- Dispatch Operating Projection (DOP)
- Telemetry
- Unit Thresholds
- Resource Plan (Base Schedules)
- Net Schedule Interchange (NSI)
- Real Time Schedule Interchange (RTSI)
- Load Forecast
  - Internal
  - CAISO
  - Etc.
EIM Analysis Points

- DOT Variance Alarms
- Telemetry Staleness
- Telemetry Floor/Ceiling
- ITC Limits
- Integration Health Checker
- Etc.
Technical Integration to PI

Legend:
- Star: Schedules data reads or writes
- Blue: Data Collection and Storage
- Orange: PI Calculations
- Green: Data Retrieval Process
- Double boxes: Denote high availability

Monarch EMS
- Sampler 1
- Sampler 2
- Sampler 3
- Sampler 4
  - Rate: 1 data point per month
  - Latency: <1s

OATI DMZ
- Rate: 1 data point per hour
- Latency: <1s

CAISO ADS
- Rate: 1 data point per hour
- Latency: <1s

PI Interface Failover Pair
- Monarch HSH PI Interface
  - Rate: 1 data point every 15 minutes
  - Latency: <1s

PI Analytics
- Rate: 1 data point every 5 minutes
- Latency: >1h

PI Data Archive
- Latency: depends on amount of data retrieved, check with OATI

PI Asset Framework
- Tidal Scheduler Service
- Tidal
- UL

OATI WebCalc
- SettleCore
- OATI Web Accounting
DOT Summary Display
Unit Details Display
Real-time Operational Analytics

- Provides aggregated real-time information on performance within the market
- Provides information on where the market is driving the BA and potential future misalignment
- Provides operators information to minimize financial impacts on the settlements
What’s Next

• Additional Displays and Alarms
• Model Maintenance Improvements
• Expansion of the AF model to include the BA grid
  • Overlays of market data onto the BA framework
  • Allows additional analysis of grid operations vs. market solution
• Utilization of EIM AF for KPI and Dashboards
Questions?
Please wait for the microphone.
State your name and company.

Please remember to...
Navigate to this session in the mobile app to complete the survey.

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