



Project Activity & RTS Market Design Review

Presented to the
Business Issues Committee

August 13, 2003

Agenda #12

Project Activity

- **Factory Acceptance Testing**
 - Began on schedule (August 1)
 - NYISO team on-site at ABB in Sugarland, TX.
- **Hardware Delivery**
 - ACC SCADA/EMS/BMS received in mid July.
 - PCC SCADA/EMS/BMS received last week.
 - Installation / integration is underway.
- **Tariff Development**
 - MSWG draft tariff language review underway
 - Committee approvals in September (target)

Project Activity

- **Major Milestone Summary**
 - **Complete FAT (early fall)**
 - **Receive / install / integrate systems (ongoing through January)**
 - **Commence Market Trials (November)**
 - **Commence MP interactive Market exercises (February)**
 - **Go-live (April)**
- **SMD2 info under OASIS**
 - **Documentation, Project Timeline, Working Group Activities, etc...**
 - **<http://www.nyiso.com/oasis/smd2.html>**

RTS Market Design Review

- **Topics Covered**
 - **Background**
 - **Architecture**
 - **Functionality**
 - **Process Benefits**

What is the Real-Time Scheduling (RTS)?

- **Project to design a new scheduling and dispatch methodology to replace both BME and SCD.**
 - **Eliminate known limitations in legacy system between scheduling and dispatch**
 - **Market enhancements limited by current applications and IT environment**
 - **SEAMS issues related to real-time transaction management**

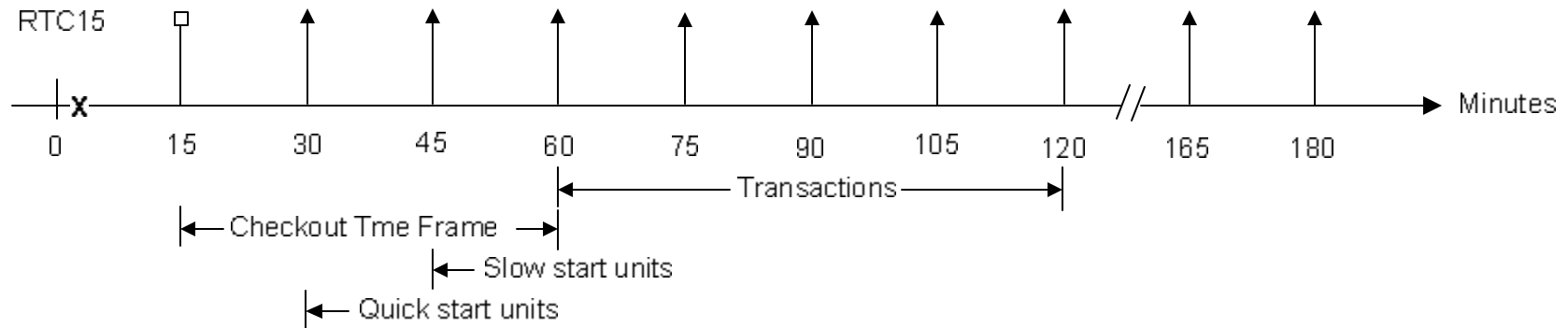
RTS Architecture

- **Real-Time Scheduling (RTS)**
 - **Real-Time Commitment (RTC)**
 - **Real-Time Mitigation (RT-AMP)**
 - **Real-Time Dispatch (RTD)**
 - **Corrective Action Mode (RTD-CAM)**

RTS Architecture

- **Real-Time Commitment (RTC)**
 - **Executes every 15 minutes**
 - **Schedules in 15 minute increments**
 - **Sliding window from 1/2 hour to 3 hours out**
 - **Schedules Transactions**
 - **Initially hourly, supportive of 1/4 schedules**
 - **Commits 10 and 30 min start resources**
 - **Recognizes unit startup times and costs**

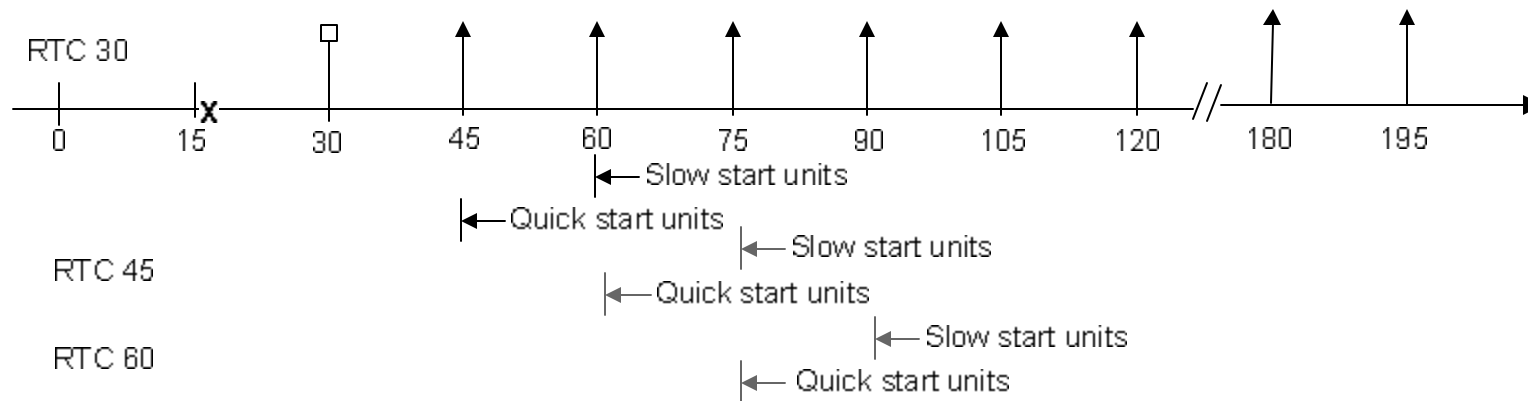
RTC – Time Line Sequence



➤ First run of hour (RTC15)

- Posts results at T=15
- Determines upcoming hour transaction schedules
- Checkout occurs as soon as neighboring control areas are ready
- Sets self-schedule unit schedules for upcoming hour
- Binding commitment for slow start units for T=45
- Commits fast start units for T=30

RTC – Time Line Sequence

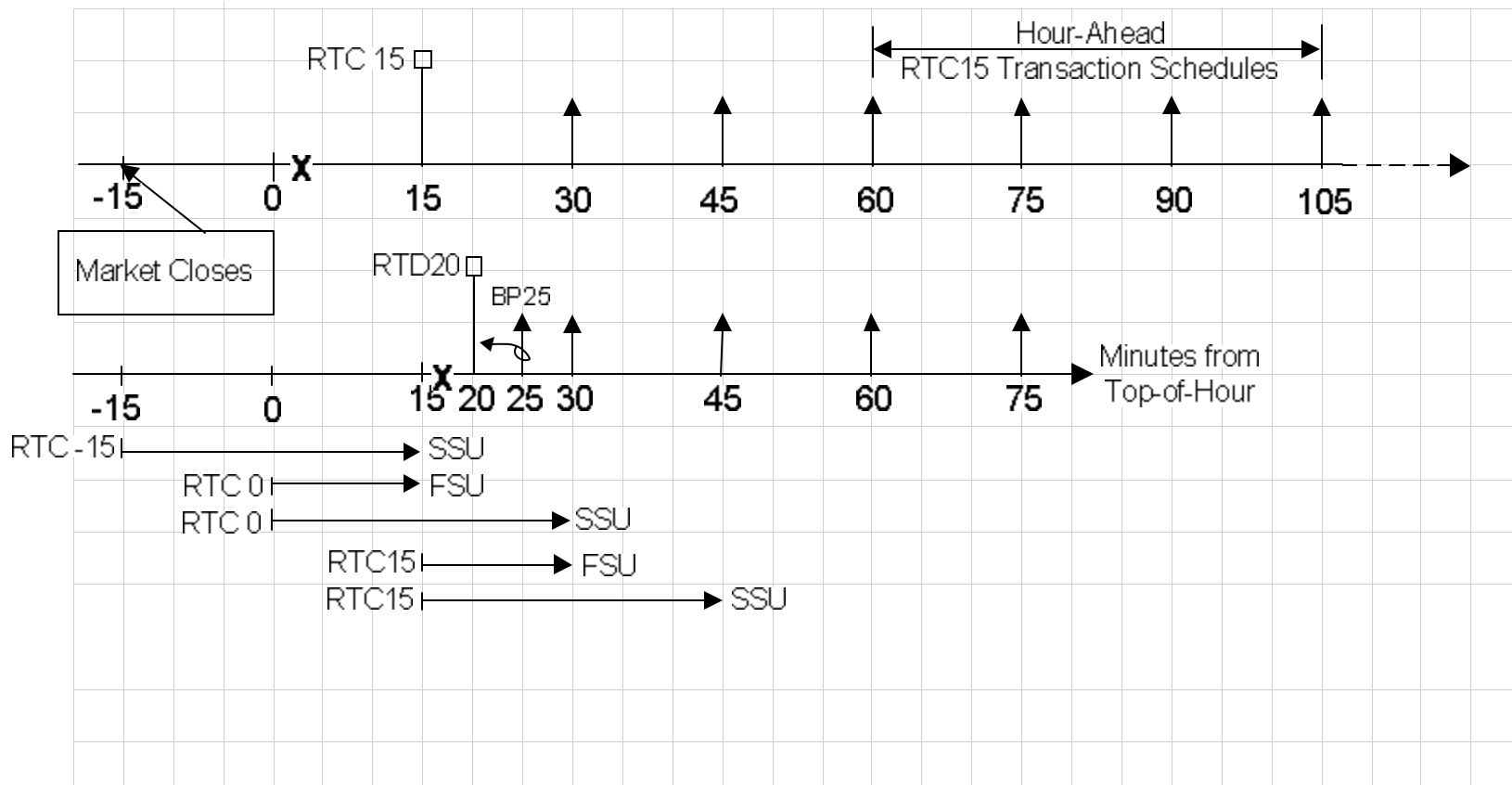


- **Remaining runs of the hour(RTC30, RTC45, RTC60)**
 - **Incorporate transaction schedules**
 - **Incorporates previous RTC unit commitments and self-schedules**
 - **Commits slow start units for T=60, 75, 90**
 - **Commits fast start units for T=45, 60, 75**

RTS Architecture

- **Real-Time Dispatch (RTD)**
 - **Executes every 5 minutes**
 - **Sliding one hour look-ahead window**
 - **Incorporate transaction schedules and self-schedules**
 - **Dispatches resources committed by RTC**
 - **Determines reserve and regulation schedules**

RTC and RTD Time Line Sequence



RTS Architecture

➤ **RTD-CAM**

- **Respond to abnormal system conditions**
- **Short look-ahead for reduced execution time**
- **Commit additional fast start units**
- **Used for:**
 - **Reserve Pickup**
 - **Emergency dispatch (Max Gen Pickup)**
 - **New set of basepoints ASAP**

Generation Comparison

	BME/SCD	RTS
Slow start units	45 min notice 60 min schedules On-the-hour run time	30 min notice 60 min schedules ¼ hr starts
Quick start units	5 min notice 60 min schedules Immediate start	10-15 min notice 60 minute schedules ¼ hr starts (on-demand start)
Self-Scheduled	45 min notice 1 hour blocks	45 min confirmation notice ¼ hr blocks
Dispatchable units	5 min notice 5 min schedules	5 min notice 60 min worth of forward advisory schedules
Regulating units	6 sec notice 6 sec schedule	6 sec notice 6 sec schedules

Committable Generation

- **Generator bids can be submitted up to 75 minutes prior to the hour**
- **Evaluations occur in all RTC evaluations based upon security and relative economics**
- **Units receive 15 or 30 minute startup notification based upon unit's bid**
- **Startup/Shutdown decisions passed to RTD for subsequent dispatches**

Self-Schedule/Self-Committed Generation

- **Generator bids can be submitted up to 75 minutes prior to the hour**
- **Bids given highest economic priority**
- **Schedules confirmed in RTC15 against network security**
- **Startup/Shutdown decisions passed to RTD for subsequent dispatches**

Operational Improvements

- **1/4 hour scheduling of internal self-schedule supply and unit commitments**
- **Ability for Demand Side Resources to participate in RT Reserve Markets**
- **More frequent forward looking advisory schedules and prices**
- **Units dispatched and responding consistent with pricing.**
- **Schedules to load forecast at 1/4 hour increments**
- **Enhanced reserve pickup logic**

Market Improvements

- **Two settlement system for Ancillary Services**
 - **Clearing price incorporates marginal lost opportunity costs**
 - **Performance incentives embedded in settlement**
- **Demand curves for Reserve and Regulation**
 - **Incorporate shortage cost into both the reserve and energy prices (both day-ahead and real-time)**
- **Real-Time Demand Response for Reserves**
- **Real-Time Market Power Mitigation**
 - **Ex-ante AMP style conduct and impact testing**
- **Explicit Self-Commit/Self-Schedule functionality**
- **Remove DAM 30-min unit must run obligation in RT**
- **3-part bidding in real-time**
 - **Start-Up/Min Gen Cost/Incremental Cost**

Improved Price Convergence

- **Between Real-Time Scheduling and Dispatch**
 - **Consistent price setting rules**
 - **Consistent reserve modeling**
 - **Forward looking algorithms**
 - **Common platform / algorithm**
- **Improved load forecast accuracy for Real-Time Scheduling**
 - **Four 15 minute intervals vs. single hourly peak**
 - **Improved short term load forecasting function**
 - **Load distribution based upon State Estimated values**

Supporting Functionality

- **State Estimator**
 - Security monitor, generator outputs, load profile
- **Load Forecast**
 - Short term regression and weather based forecast
- **Simulator**
 - Trials, Training, Testing
- **SCADA/EMS Integration**
 - Platform development to support robust system
- **SCUC Performance Enhancements**