

**ERCOT OPERATIONS REPORT
ON THE
EECP EVENT
OF
JUNE 18, 2008**

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Executive Summary

ERCOT implemented Step One of its Emergency Electric Curtailment Plan (EECP) at 16:25 on June 18, 2008. EECP was declared due to the ERCOT Adjusted Responsive Reserve (ARR) falling below 2300 MW. The primary factor leading to the implementation of the EECP was a load forecast error of approximately 2100 MW caused by uncertainty in the weather forecast in both Day-Ahead and current day operations. The following operations report discusses primary and contributing factors leading up to and during the EECP event and action items that ERCOT has taken in response to the event.

Day-Ahead Activities

ERCOT uses multiple load forecast vendors. ERCOT System Operations noted a significant difference in the day-ahead load forecasts between these vendors, caused by a 4-5 degree difference in temperature forecast in the three major load zones: North Central, Coast, and South Central. ERCOT selected the higher forecast prior to running the Replacement Reserve Service (RPRS) market study. The forecast which was used predicted a peak load of 56,733 MW for HE 17. There proved to be a 2 degree difference between the highest load forecast temperatures and the actual temperatures in the three major load zones for the peak hour.

All the ERCOT load forecast tools used as input, predicted temperatures a minimum of 2 degrees below the actual temperature for the major load zones on the peak hour.

The RPRS market study for the Operating Day of June 18th, 2008 procured six units for congestion, totaling 664 MW of capacity for various intervals from HE 16 through HE 18. RPRS also procured three units for capacity, totaling 269 MW for the same hours. For RPRS procurement ERCOT utilized the wind schedules in the day-ahead resource plan which were 1000 MW higher than the actual wind power production in Real-Time.

Adjustment Period Activities

During the Adjustment Period, ERCOT was aware of a significant probability of rain forecast in the Dallas/Ft Worth area having an influence on the temperature forecast. Around 12:00 PM it was determined that rain was very unlikely. In addition, it was discovered that the wind forecast had stale data. This was also corrected prior to 12:00 PM. The updated forecast indicated approximately 1500 MW reduction in expected wind energy. Given these factors, ERCOT Operations became aware of a potential capacity insufficiency.

Market Participants removed four units, totaling approximately 200 MW of capacity, from their resource plan between the end of Day-Ahead RPRS and Real-Time for HE 17. Market Participants also brought on-line seventeen units, totaling approximately 1261 MW of capacity between the end of RPRS and Real-Time for HE 17.

ERCOT procured sixteen units totaling 898 MW via OOMC between 13:27 and 16:21 on June 18th after issuing the alert due to capacity shortage.

Time Line and Description of Significant Events

6/17

- 13:33 Day-Ahead forecasts varied between 53,882 MW and 56,734 MW. The posted forecast, and the one used in RPRS was 56,733 MW.

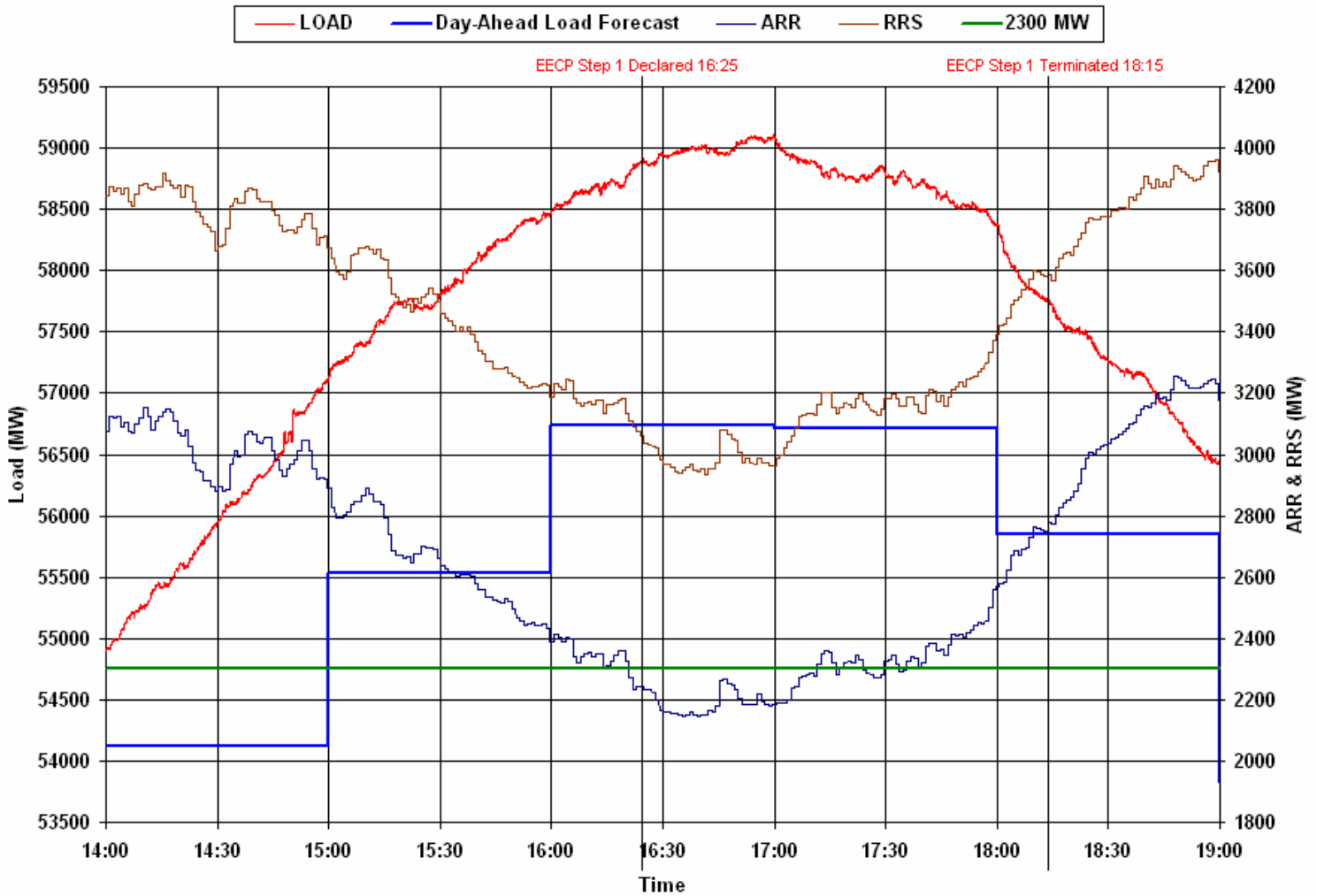
6/18

- 13:18 ERCOT deployed Non-Spin Reserve (NSRS) in South and West zones for IE 1345 due to depletion of up balancing in West zone by 97% and congestion in the South zone.
- 13:22 ERCOT issued an Alert due to capacity shortage for hours 1600 – 1900.
- 13:27 ERCOT issued OOMC/OOME for **UNIT A, B, C, and D** for HE 1400 – HE 2000 due to capacity shortage.
- 13:27 ERCOT issued OOMC/OOME for **UNIT E and F** for HE 1400 – HE 1900 due to capacity shortage.
- 14:17 ERCOT deployed NSRS in North and Houston zones for IE 1500 due to depletion of up balancing bids.
- 14:21 ERCOT issued OOMC for **UNIT G** for HE 1700 – HE 2200 due to capacity shortage.
- 14:24 ERCOT issued an Advisory notifying the Market that ARR dropped below 3000 MW.
- 14:46 ERCOT issued OOME for **UNIT H and I** for IE 1500 – 2200 due to capacity shortage.
- 14:55 ERCOT issued OOMC for **UNIT J and K** for HE 1800 – HE - 1900 due capacity shortage.
- 15:00 ERCOT issued OOMC for **UNIT L and M** for HE 1600 – HE 1900 due to capacity shortage.
- 15:16 ERCOT issued OOMC for **UNIT N** for HE 1800 – HE 2100 due to capacity shortage.
- 15:40 ERCOT issued OOME for **UNIT O and P** for IE 1600 – 2200 due to capacity shortage.
- 15:50 ERCOT issued an Alert notifying the Market that ARR dropped below 2500 MW.
- 16:12 **Qualified Scheduling Entity (QSE) A** reported that **UNIT Q** tripped off with 68 MW.

- 16:21 ERCOT issued OOME for **UNIT R** for IE 1645 – IE 1900 due to capacity shortage.
- 16:25 ERCOT declared EECF Step 1 due to ARR below 2300 MW.
- 16:25 ERCOT notified SPP of EEA 1 status. SPP reminded ERCOT that emergency transmission service was not available until ERCOT is in EEA 2.
- 16:29 ERCOT requested **AEP Transmission Operator (TO)** to check with CFE for assistance over the South DC-Ties.
- 16:30 ERCOT issued OOME for **UNIT R** for IE 1715 – IE 1900 due to EECF Step 1.
- 16:33 ERCOT requested from **QSE B** any available energy for an EEA 1 schedule, however no current hour transmission service was available.
- 16:37 ERCOT issued OOMC for **UNIT S, T, U and V** for HE 1700 - HE 1900 for EECF Step 1.
- 16:38 ERCOT issued OOME for **UNIT W, X, and Y** for IE 1700 – IE 1900 for EECF Step 1.
- 16:42 **AEP TO** reported that CFE had no power at the time but CFE may have 50 MW after 1700.
- 16:54 ERCOT issued OOME for **UNIT Z, AA, and BB** for IE 1715 -IE 1900 for EECF Step 1.
- 17:00 ERCOT issued OOMC for **UNIT CC and R** for HE 1900 – HE 2000 for EECF Step 1.
- 18:05 **QSE D** requested ERCOT to retract OOMC on **UNIT V** due to the unit not starting.
- 18:15 ERCOT terminated EECF Step 1.
- 18:55 ERCOT terminated NSRS deployment in North and West Zone at 1930.
- 19:00 ERCOT terminated NSRS deployment in Houston Zone at 2000.
- 19:35 ERCOT terminated NSRS deployment in South zone at 2100.
- 20:01 ERCOT terminated Alert and Advisory for ARR.

Observations/Data Review

06/18/08 14:00 – 19:00 LOAD, DAY-AHEAD LOAD FORECAST, ARR, AND RRS



The Reserve Discount Factor was 7 % for the North Central and South Central load zones, and 5 % for the Coast load zone during the EECP event. The Responsive Reserve requirement for the 18th, based on forecast temperatures, was 2600 MW for the peak hours. If the day-ahead forecasted temperatures had been more accurate, the requirement would have been 2800 MW.

The predicted hourly average load for HE 17 used in the ERCOT day-ahead process was 56,733 MW. The actual hourly average load for HE 17 was 58,864 MW, approximately 2,131 MW above the day-ahead forecast. ERCOT experienced an instantaneous peak load of 59,105 MW at 16:59.

06/18/08 12:00 – 24:00 LOAD ZONE TEMPERATURE DAY-AHEAD FORECAST & REAL-TIME TEMPERATURE FOR COAST, NORTH CENTRAL, AND SOUTH CENTRAL LOAD ZONES

Coast							
Date and Time	Actual Temperature		Forecast		Error in Degrees (Forecast-Actual)		Hourly Load Ratio Share
	A	B	A	B	A	B	
6/18/2008 15:00	93.3	93.0	89.4	94.0	-3.9	1.0	28.84%
6/18/2008 16:00	93.4	95.0	89.6	94.0	-3.8	-1.0	28.74%
6/18/2008 17:00	95.4	95.0	89.4	93.0	-6.0	-2.0	28.50%
6/18/2008 18:00	94.3	95.0	88.9	92.0	-5.4	-3.0	28.29%
6/18/2008 19:00	93.3	86.0	88.1	90.0	-5.2	4.0	28.01%

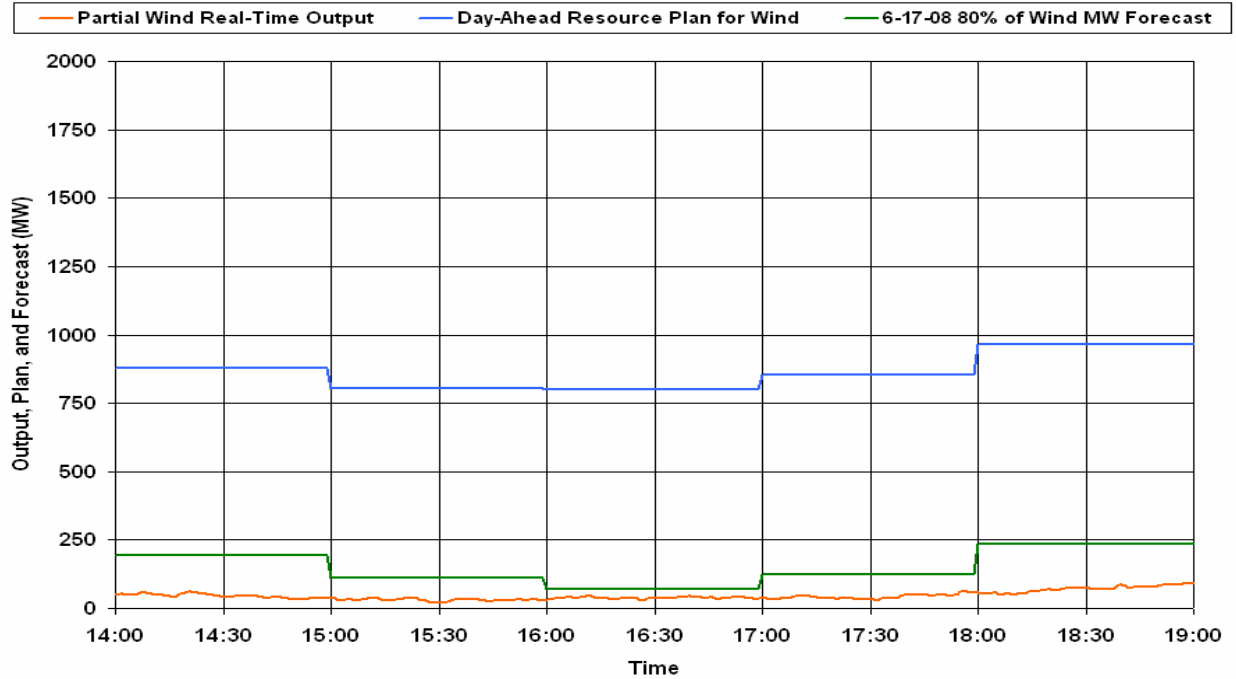
North Central							
Date and Time	Actual Temperature		Forecast		Error in Degrees (Forecast-Actual)		Hourly Load Ratio Share
	A	B	A	B	A	B	
6/18/2008 15:00	93.0	94.0	86.5	90.0	-6.5	-4.0	31.46%
6/18/2008 16:00	94.0	96.0	88.5	92.0	-5.5	-4.0	31.51%
6/18/2008 17:00	95.8	94.0	90.0	92.0	-5.8	-2.0	31.63%
6/18/2008 18:00	95.3	93.0	90.3	92.0	-5.0	-1.0	31.78%
6/18/2008 19:00	94.5	93.0	90.3	90.0	-4.3	-3.0	31.89%

South Central							
Date and Time	Actual Temperature		Forecast		Error in Degrees (Forecast-Actual)		Hourly Load Ratio Share
	A	B	A	B	A	B	
6/18/2008 15:00	96.0	97.0	88.5	95.0	-7.5	-2.0	18.56%
6/18/2008 16:00	97.5	98.0	91.5	96.0	-6.0	-2.0	18.65%
6/18/2008 17:00	98.5	99.0	93.5	97.0	-5.0	-2.0	18.84%
6/18/2008 18:00	99.0	98.0	94.5	96.0	-4.5	-2.0	18.96%
6/18/2008 19:00	98.5	98.0	94.5	95.0	-4.0	-3.0	19.03%

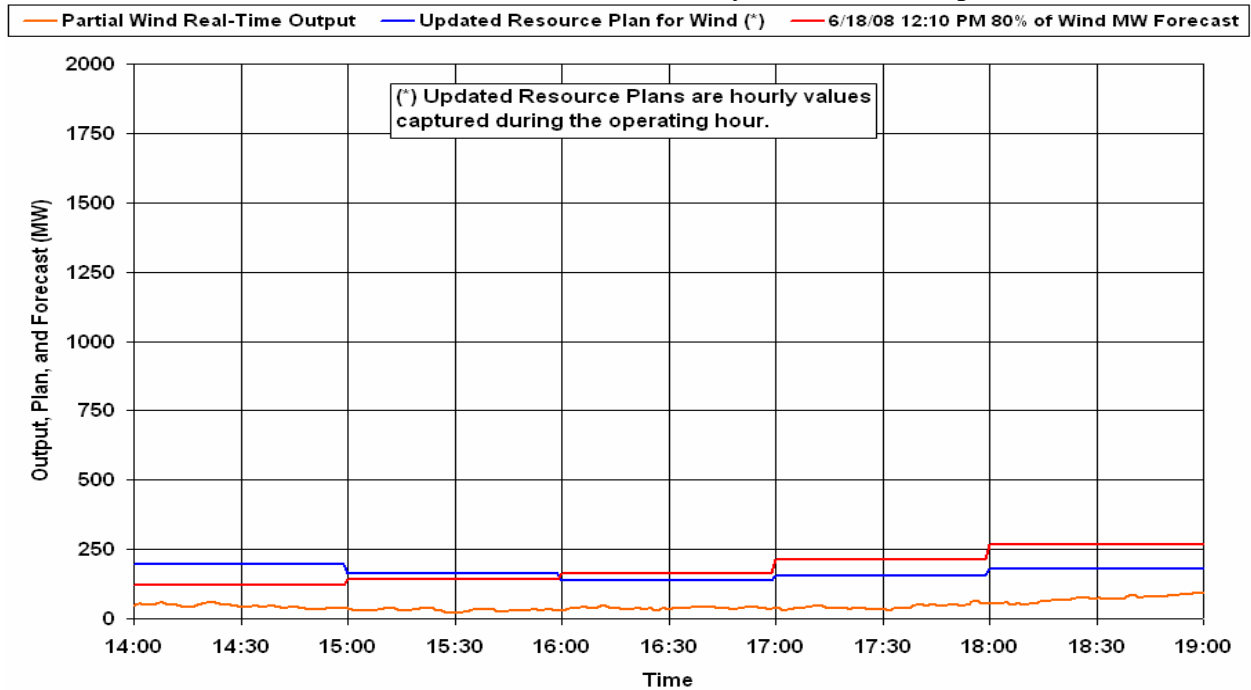
Actual temperatures differ between the two forecast services due to different weighting of individual weather station data.

06/18/08 HE 14:00 – HE 19:00 WIND OUTPUT FORECASTS IN THE 16:00 DAY-AHEAD
AND UPDATED (*) RESOURCE PLANS

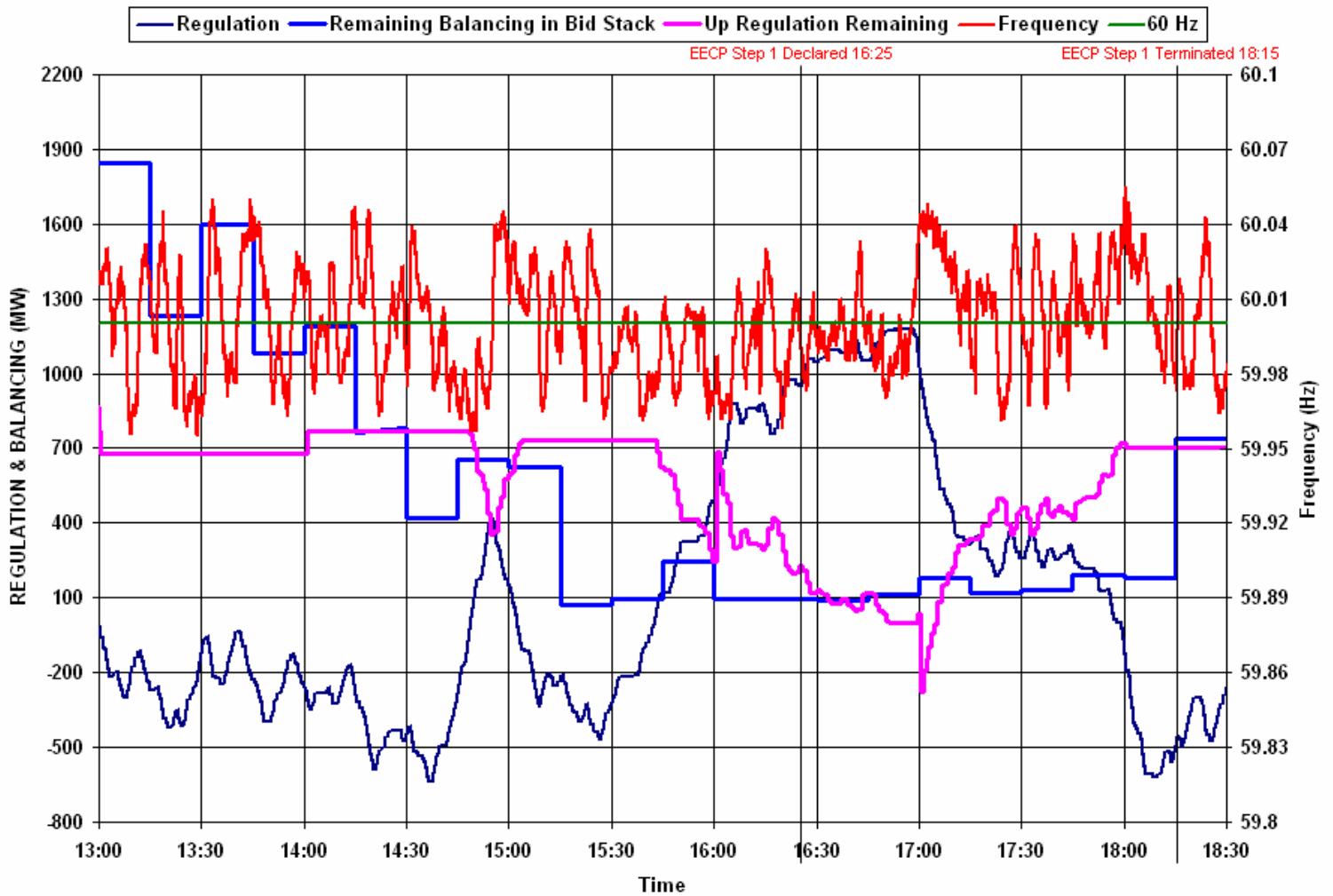
Currently the 80% wind forecast only includes 39 of the 54 units in the ERCOT model, approximately 4000 MW of the overall 5350 MW of total installed capacity in the ERCOT system, based on seasonal capacity numbers. The following graphs reflect only the units used in the wind forecast provided by AWS Truewind.



The day-ahead resource plan used for the wind units did not indicate the extremely low production of wind energy that was observed in Real-Time. However, the 80% wind forecast that was developed for (and will be incorporated into) the Nodal system shown in green did predict the wind output with good fidelity in the day-ahead planning process. This incident indicates that PRR 763 should result in more accurate day-ahead resource plans for wind units.

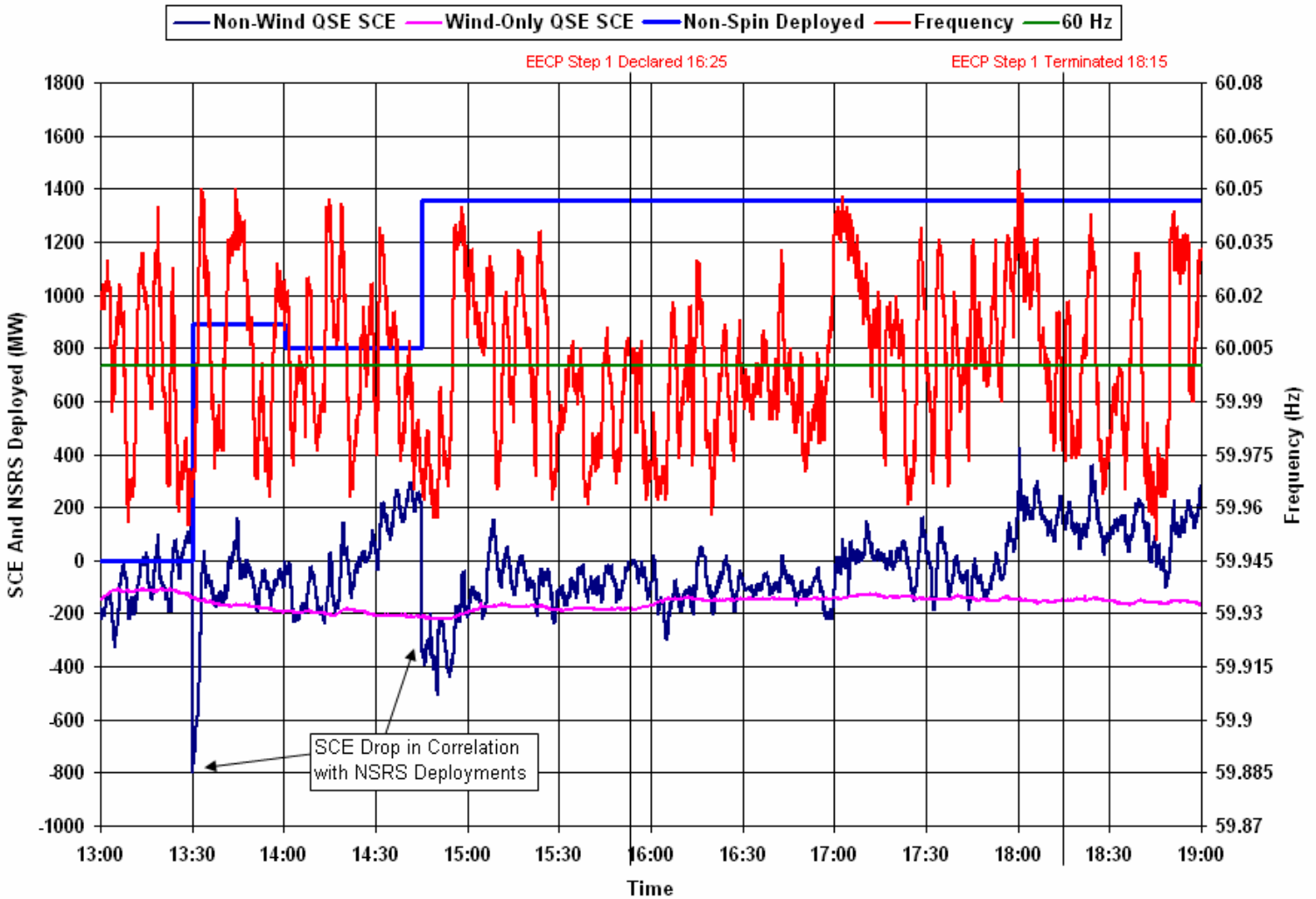


06/18/08 HE 13:00 – HE 18:30 REGULATION, REMAINING BALANCING IN BID STACK, AND FREQUENCY



The illustration shown above demonstrates the steady decline in energy available in the Balancing Energy stack, combined with the depletion of up-regulation service between 16:00 and the declaration of EECP at 16:25.

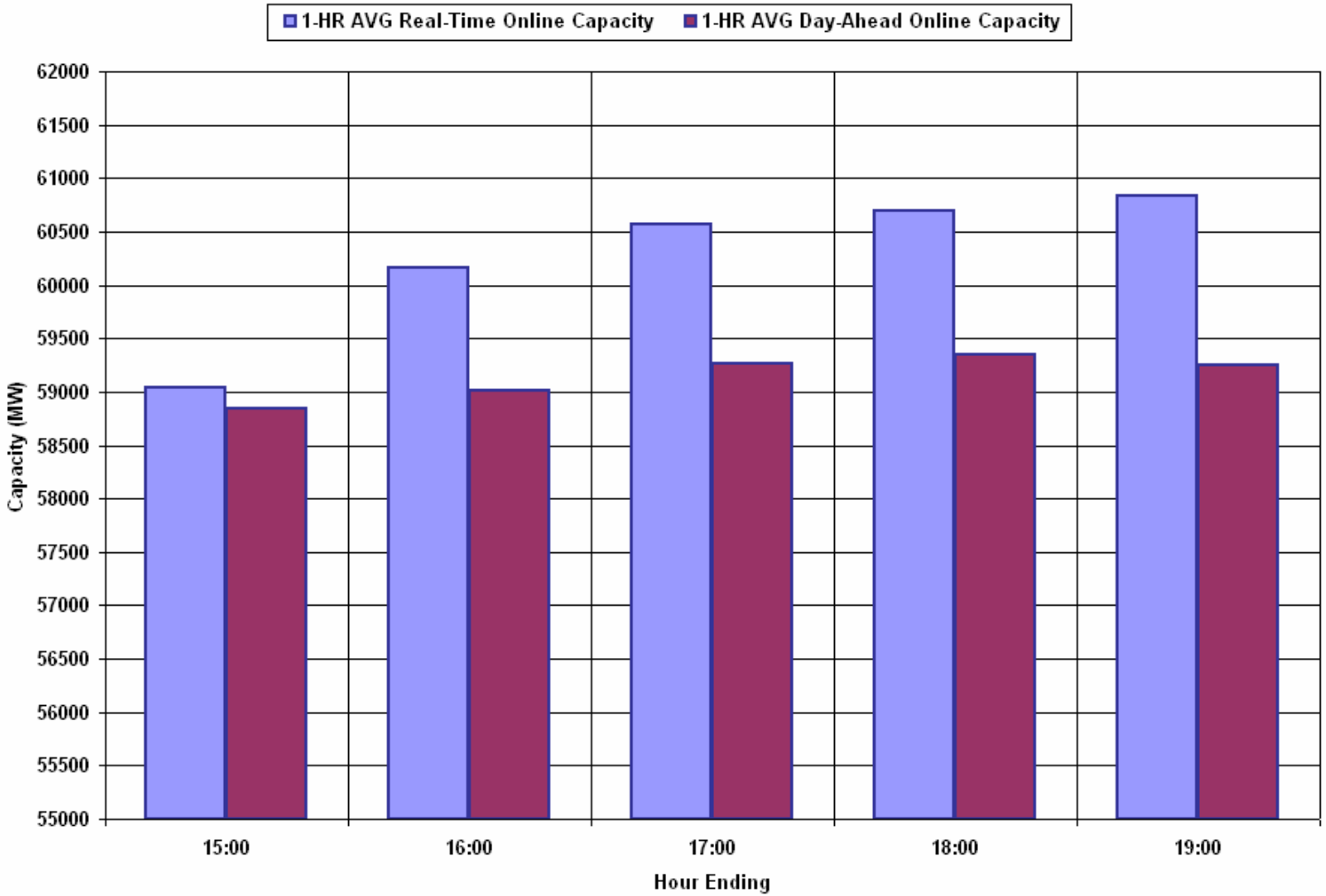
06/18/08 HE 13:00 – HE 19:00 NON-WIND QSE SCE, WIND-ONLY QSE SCE, NON-SPIN DEPLOYMENT, AND FREQUENCY



A non-spin deployment was issued at 13:18 for IE 1345 due to the projected depletion of the Up Balancing Energy bid stack in the West zone and for relief of congestion to the South zone.

A non-spin deployment was issued at 14:17 for IE 1500 due to depletion of the Up Balancing Energy bid stack in the North and Houston zones.

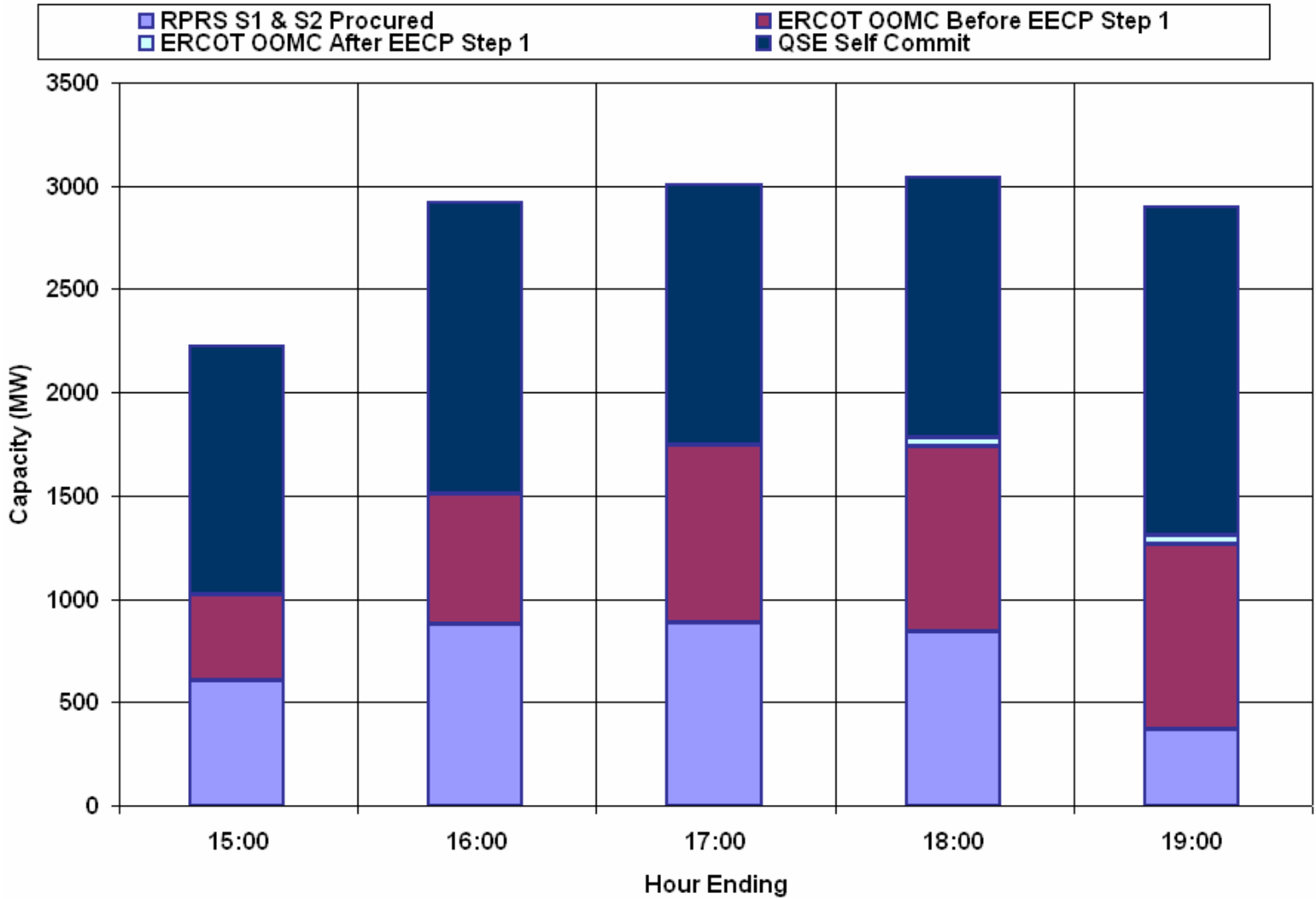
06/18/08 HE 15:00 – HE 19:00 1-HOUR-AVERAGE REAL-TIME ONLINE CAPACITY AND
1-HOUR-AVERAGE DAY-AHEAD ONLINE CAPACITY



	1-HR AVG Real-Time Online Capacity (MW)	1-HR AVG Day-Ahead Online Capacity (MW)
15:00	59033	58839
16:00	60163	59018
17:00	60568	59266
18:00	60697	59345
19:00	60839	59255

The RPRS market study for the Operating Day of June 18th, 2008 procured six units for congestion, totaling 664 MW of capacity for various intervals from HE 16 through HE 18. RPRS also procured three units for capacity, totaling 269 MW for the same hours.

06/18/08 HE 15:00 – HE 19:00 RPRS S1 & S2 PROCURED, ERCOT OOMC BEFORE EECP STEP 1, ERCOT OOMC AFTER EECP STEP 1 AND QSE SELF COMMIT CAPACITY



	15:00	16:00	17:00	18:00	19:00
RPRS S1 & S2 Procured	604	873	885	838	364
ERCOT OOMC Before EECP Step 1	415	632	857	898	898
ERCOT OOMC After EECP Step 1	0	0	0	44	44
QSE Self Commit	1205	1417	1261	1262	1589
Total	2224	2922	3003	3042	2895

Action Items and Lessons Learned

- The implementation of PRR 763, incorporating the AWS Truewind Forecast into the day-ahead resource plans, should reduce the impact of the issue of planned wind output day-ahead not matching that of Real-Time.
- ERCOT is working on developing a methodology for taking into account risks associated with load and wind forecasting and forced outage rates to assist in early procurement of additional resources or reserves.
- The Excel MAI tool helped ERCOT Operations recognize the need to OOMC additional capacity online. It has been modified to notify the operators when the wind forecast has not been updated in a timely fashion, and ERCOT Operations Support has an engineer on-call.