



April 17, 2006 EECP Event

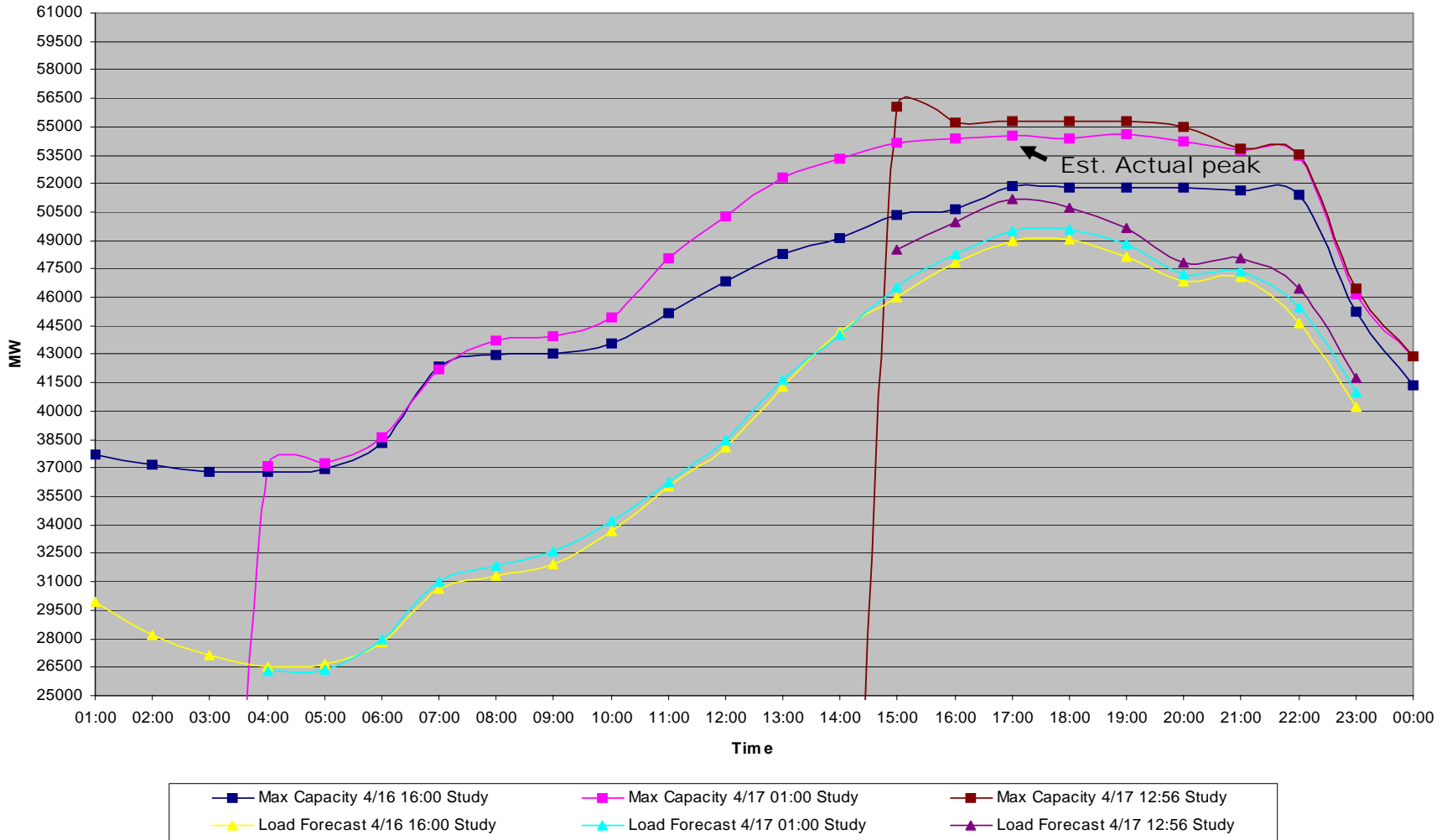
- **Chronological Review of Events**
- **Load Forecast Issues**
- **Resource Plan/Available Capacity Issues**

- **16:00 April 16 Replacement Study**
 - Peak load forecast – 49,018 MW
 - On-line peak capacity scheduled – 50,661 MW
- **ERCOT procured additional 2,542 MW RPRS and OOMC for HE 16 and 17 on April 17**
- **01:00 April 17 Replacement Study**
 - Peak load forecast – 49,591 MW
 - On-line peak capacity scheduled – 54,382 MW
 - No need seen for additional capacity

- **Load tracking above forecast**
- **13:00 Replacement Study**
 - **Peak load forecast – 51,114 MW**
 - **On-line peak capacity scheduled – 55,234 MW**
 - **Included 490 MW that tripped between 12:00 and 13:00**
 - **Resource Plans also showed 1,800 MW off-line capacity available within 30 minutes**
 - **No need seen for additional capacity**
- **Actual demand at 14:00 was 49,194 MW**

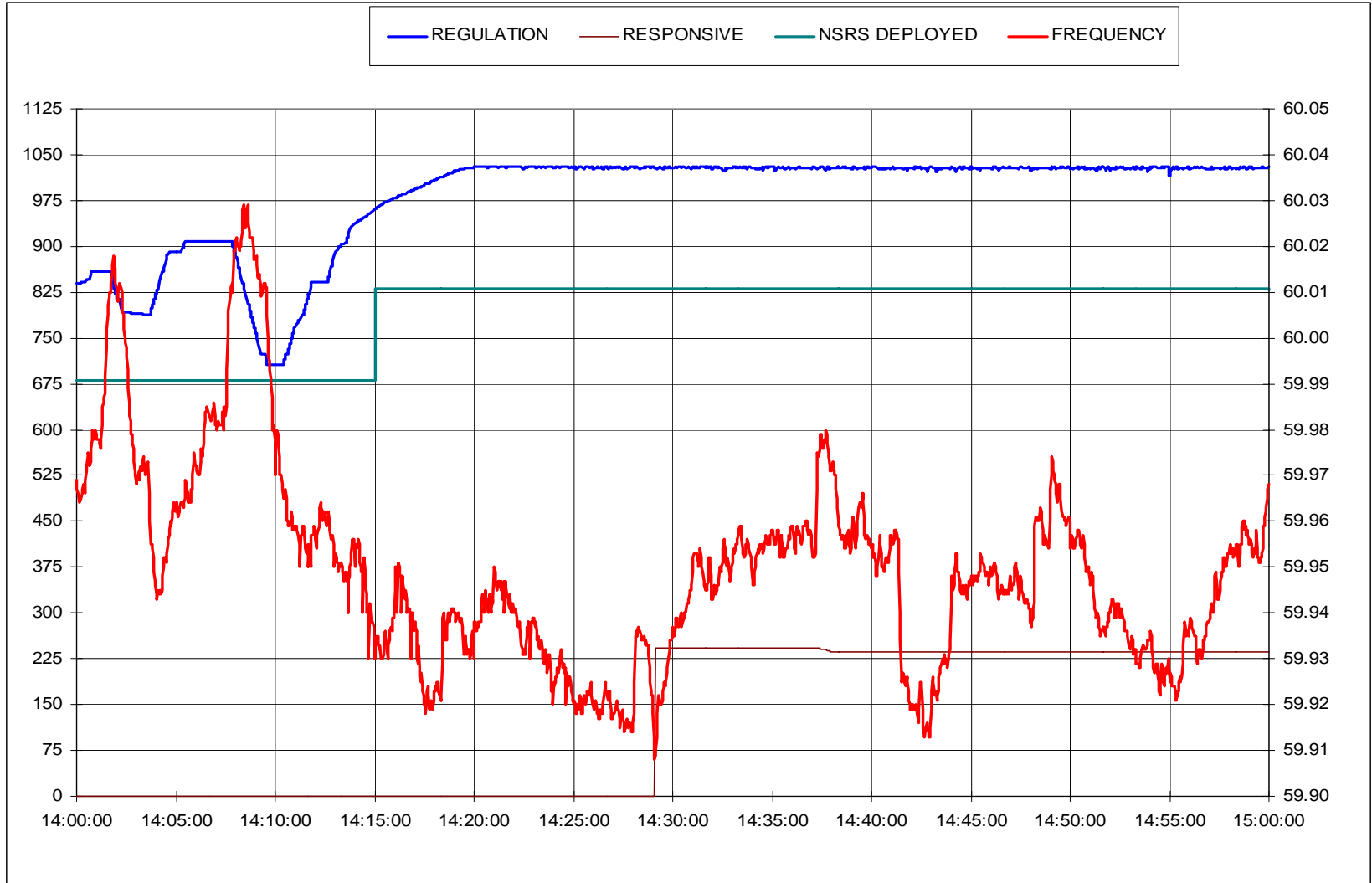
Summary of Load/Capacity Outlook

Resource Plan Max Capability and Load Forecast Comparison between 16:00, 01:00, and 12:56 Studies



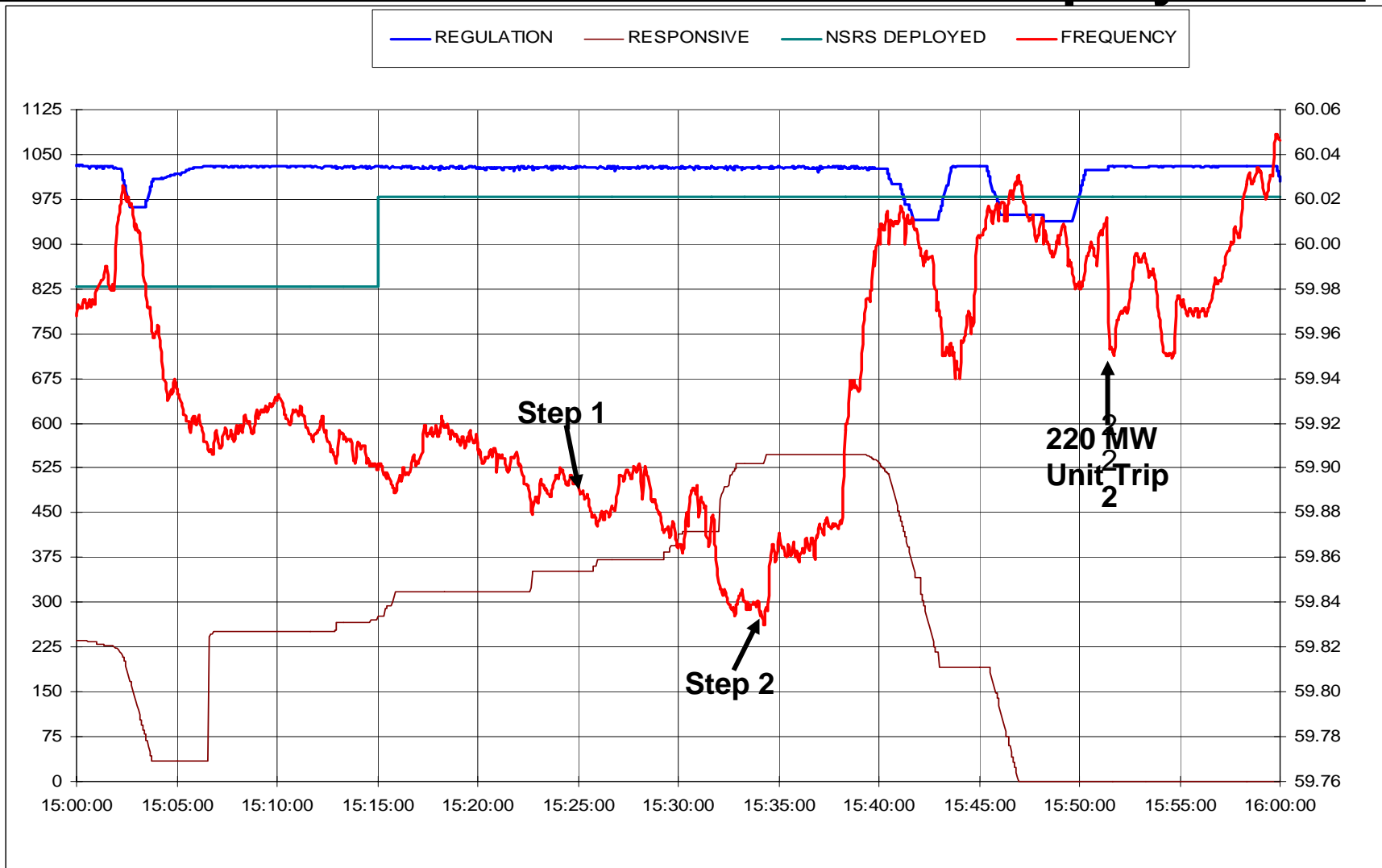
- **At 13:45, 94% of BES used – 680 MW NSRS deployed**
- **At 13:52 it was found a QSE did not have the 600 MW of available reserve that it was showing**
- **At 14:20 ERCOT had deployed all Regulation Service**
- **At 14:29 243 MW of Responsive on generation automatically deployed**
- **At 14:36 another QSE showing available reserve was contacted and OOMEd 300 MW**
- **At 15:00 99% of BES used – additional 200 MW NSRS deployed**

14:00-15:00 Frequency and A/S Deployments



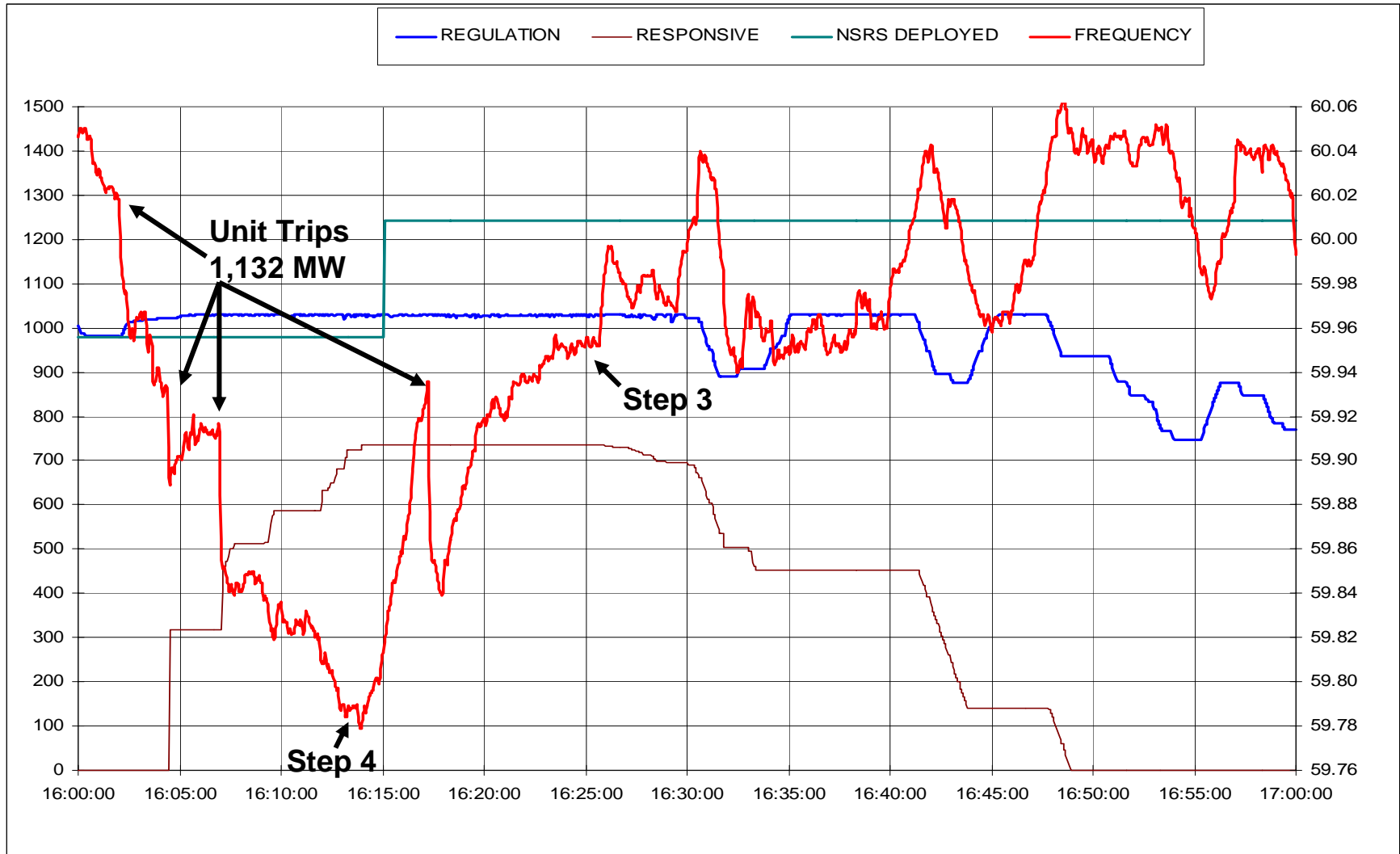
- **At 15:00 demand was 51,480 MW**
 - **At the beginning of the hour frequency and regulation briefly recovered but began to decline again**
 - **At 15:14 another QSE showing reserves was OOMEd to increase 200 MW**
 - **Frequency continued decline and EECP Step 1 declared at 15:25**
 - **All capacity available to be brought on line and generating**
 - **Started scheduling emergency assistance over the DC ties**
 - **Frequency continued declining and EECP Step 2 declared at 15:34**
 - **LaaRs and other interruptibles to be tripped**
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15:00-16:00 Frequency and A/S Deployments



- At 16:00 frequency had recovered to 60 Hz and 150 MW emergency schedule began flowing over the East DC tie
- Between 16:01 and 16:07 three units experienced forced outages totaling 1,197 MW capacity
- Frequency went below 59.8 HZ
- At 16:13 Step 4 was implemented with a hot-line call to Transmission Operators asking for 1,000 MW firm load shedding
- At 16:17 another unit with 486 MW capacity tripped
- At 16:25 EECF Step 3 – Public Appeal for Conservation issued
- Frequency recovered to 60 HZ by 16:30

16:00-17:00 Frequency and A/S Deployments





Load Shed Responsibility

Transmission Operator	2005 Total Transmission Operator Load (MW)
American Electric Power	9.50
Austin Energy	3.90
Brazos Electric Power Cooperative	3.89
CenterPoint Energy	24.56
City of Bryan	0.53
City of College Station	0.29
City of Denton	0.50
City of Garland	0.99
City Public Service of San Antonio	7.05
Lower Colorado River Authority	4.96
Magic Valley Electric Cooperative	0.53
Public Utility Board of Brownsville	0.41
Rayburn Country Electric Cooperative	1.00
South Texas Electric Coop-Medina Electric Coop	0.60
Texas New Mexico Power	2.26
Tex-La	0.15
TXU-Electric Delivery	38.88
ERCOT Total	100.00

- After 17:00 frequency began to stabilize around 60 Hz and regulation and responsive reserves started coming back
- Between 17:32 and 18:10 TOs allowed to restore all firm load
- Between 18:21 and 18:29 QSEs allowed to restore LaaRs and other interruptible loads
- Went back to EECP Step 1 at 18:48 and discontinued DC tie assistance
- EECP officially cancelled at 19:20



April 18 Replacement Studies

Time of Study	Peak Load Forecast at the Time	Max Capacity Shown by QSEs for Peak	Additional Capacity Procured
18:00 April 17	49,879 MW	54,863 MW	641 MW
21:00 April 17	52,852 MW	54,951 MW	534 MW
02:00 April 18	53,573 MW	56,678 MW	673 MW

52,231 MW actual peak

- **Load forecast was lower than actual loads**
 - Peak load would have been ~ 53,817 MW if load had not been interrupted (actual was 51,613 MW)
 - All-time April peak was 49,280 MW in late April 2002
 - April 17 Peak Load forecasts
 - 49,018 MW @16:00 April 16
 - 49,591 MW @01:00 April 17
 - 51,114 MW @13:00 April 17

- **Why?**
 - Temperature forecast for DFW area was 5° low (95° vs 100°)
 - Accounts for about 1,000 - 1,500 MW error
 - Parameter set incorrectly to adjust for past actual loads (fixed)
 - Low load forecast for Coast (Houston) area (under investigation)

- **The Resource Plan used for the 13:00 April 17 Replacement Study showed 55,283 MW of maximum generating capacity on-line at peak**
 - Operator saw no problem meeting 51,114 MW forecast
 - Would have been enough to cover 53,817 MW load plus 1,150 Responsive Reserve on units, but not by much
 - Judgment call on whether to call an Alert if forecast had been 53,817 MW
- **However, Resource Plans at 13:00 for peak hour:**
 - Showed 793 MW that had tripped before 13:00 or was started late (after 16:00)
 - Included 1,683 MW capacity that tripped between 15:51 and 16:17

- **Peak load forecast used for the 16:00 April 16 Replacement Study had been 53,817 MW instead of 49,018 MW**
 - An additional 1,026 MW of capacity off-line at peak April 17 would have been procured
 - Given actual unit trips, would have still been in EECP
 - Might have avoided Step 4, but would have been close
- **Units had not tripped or started late**
 - Might have avoided EECP altogether, but would have been close