

# Texas Reliability Entity Event Analysis

## Event: Summary of EEA Events 8/2/2011-8/5/2011

Texas Reliability Entity  
August 16, 2011

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## Executive Summary

From August 2 through August 5, 2011, the ERCOT Region experienced Energy Emergency Alerts (EEA) on successive days due to the combination of extreme temperatures, high loads, and generation outages due to maintenance and repair. The total duration of the EEA events was 14.7 hours over the four day period.

The Reliability Coordinator (RC) declared an EEA Level 1 each day after the Physical Responsive Capacity (PRC) dropped below the 2300 MW minimum level required by the Balancing Authority (BA). On August 4, 2011, the RC declared an EEA Level 2 after PRC levels dropped below the 1750 MW level. Non-Controllable Load Resources (NCLR) and Emergency Interruptible Load Sources (EILS) loads were deployed by the RC in response to the EEA Level 2 declaration.

This report provides: (1) an overview of the events; (2) background on system conditions just prior to the events; (3) the detailed sequence of events; (4) an analysis of the causal and contributing factors for concerns that arose in the events; and (5) recommendations for follow-up action.

### I. Event Overview

The table below provides a summary of the EEA events from August 2-5, 2011.

Energy Emergency Alert (EEA) Events Summary							
Date	EEA Level	Start/End Time	Duration	Peak Load HE	Frequency Max/Min HZ	NCLR MW	EILS MW
Aug 2	1	2:40/6:00pm	3h 20min	67,929 MW* HE 17	60.049/59.965	N/A	N/A
Aug 3	1	2:50/6:10pm	3h 20min	68,294 MW* HE 17	60.04/59.928	N/A	N/A
Aug 4	2B	1:45/6:52pm	5h 7min	66,849 MW HE 16	60.078/59.95	881 MW**	** Analysis on-going
Aug 5	1	3:10/6:05pm	2h 55min	66,661 MW HE 17	60.028/59.963	N/A	N/A

\* NOTE: New ERCOT Region peak demand record

\*\* NOTE: Analysis ongoing

The event did not meet the definition of a reportable event under NERC's Event Analysis Working Group (EAWG) procedure.

## II. Initial System Conditions Prior to Events

	8/2/2011	8/3/2011	8/4/2011	8/5/2011
System Projected Peak Load	67084	68298	68298	67794
System Generation Capacity	66950	66174	66265	65667

### Weather in the major cities around the Region:

Austin	103	106	104	105
DFW	108	108	109	108
Houston	104	99	100	101
San Antonio	101	104	103	104
Brownsville	95	96	97	97

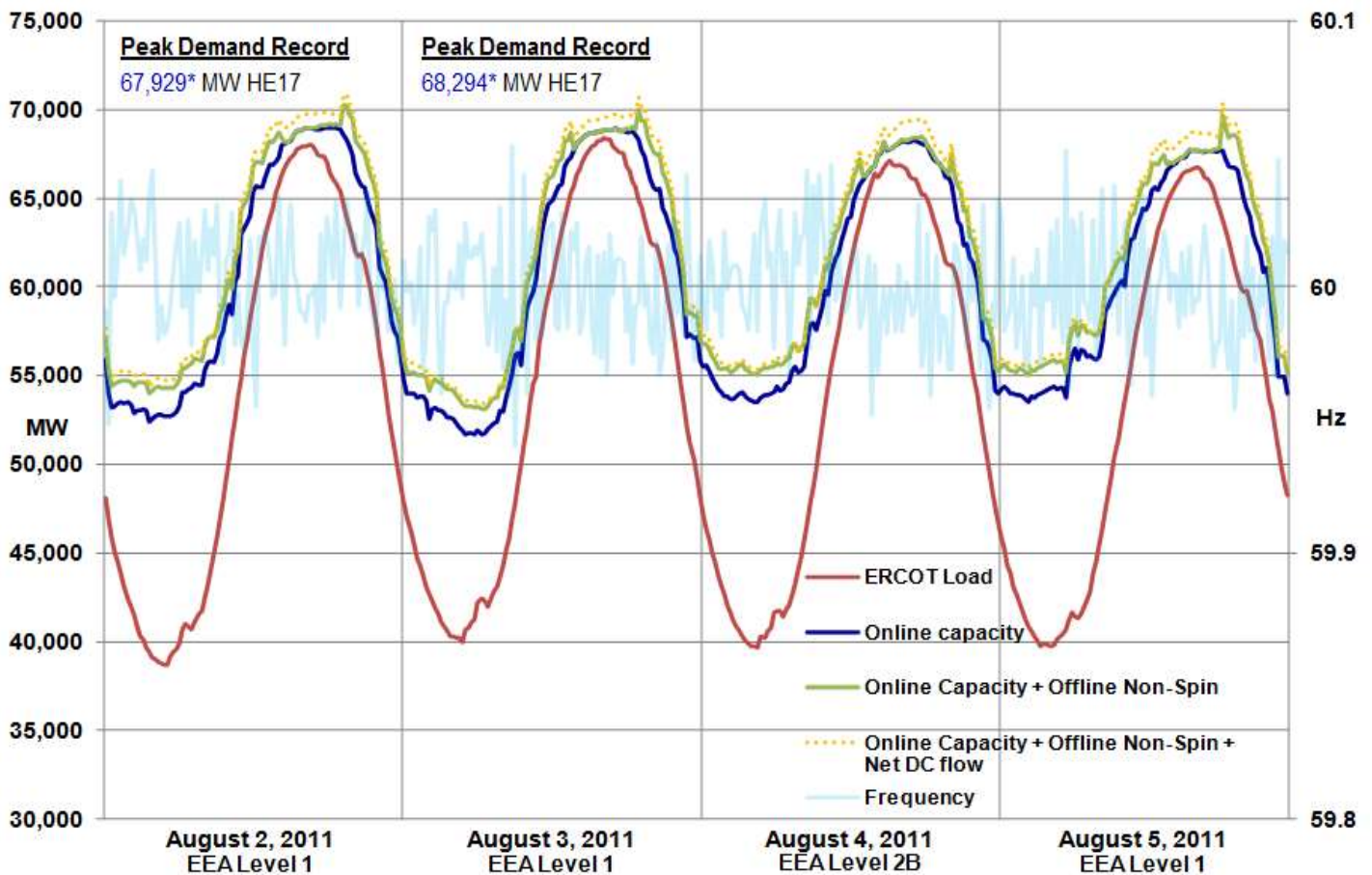
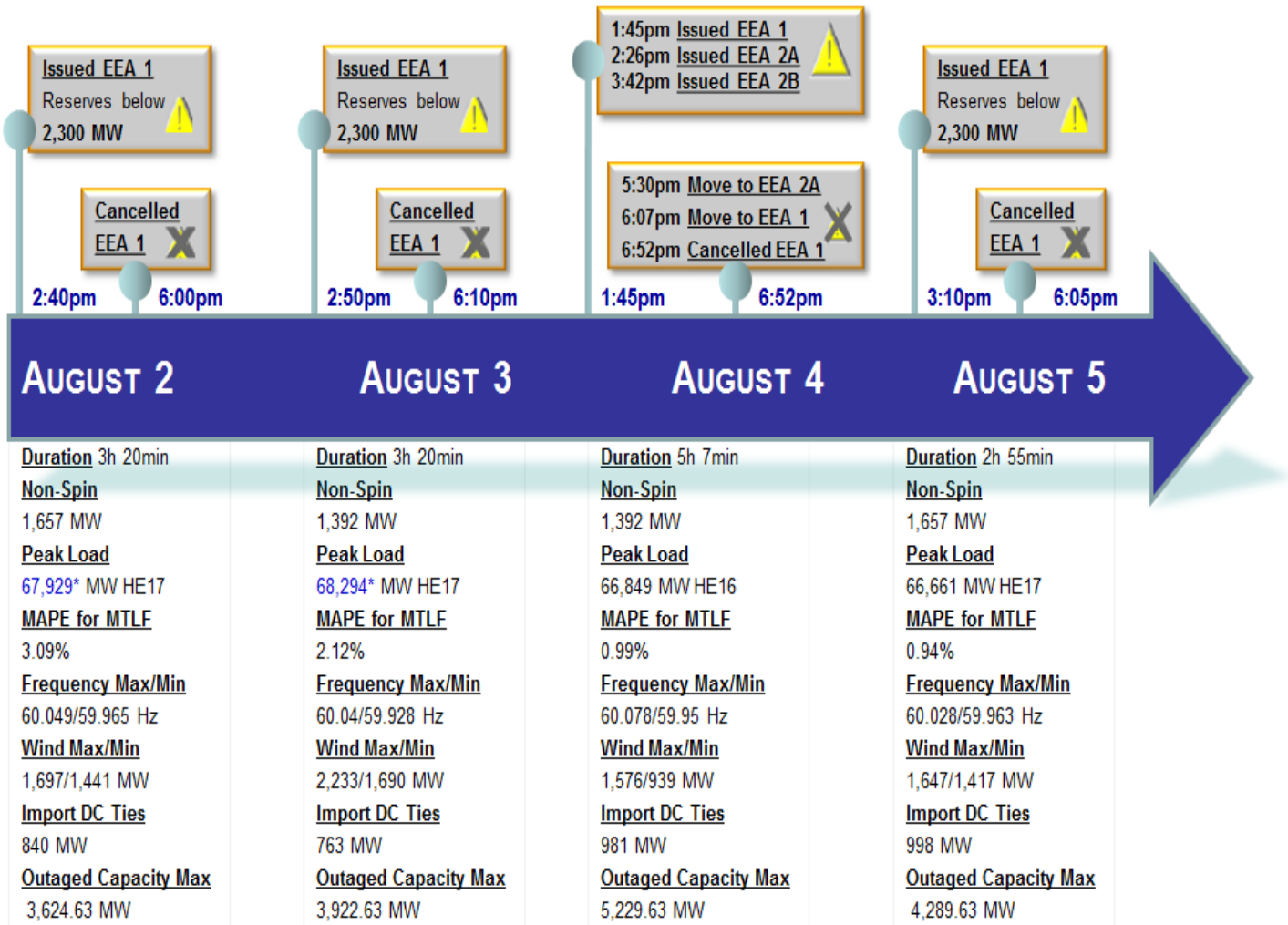


Figure 1: Load, Capacity, and Frequency for August 2-5, 2011

### III. Sequence of Events on 08/02/2011-08/05/2011



Note: \*ERCOT breaks peak demand record

Figure 2: EEA Timelines for August 2-5, 2011

## IV. Analysis of Events

The EEA events experienced in the ERCOT Region on August 2-5, 2011 were due to the combination of extreme temperatures, high loads, and generation outages due to maintenance and repair. New ERCOT Region peak demand records were set on successive days on August 2 and August 3. A new peak demand record may also have been set on August 4, if not for the deployment of over 1400 MW of load resources in response to the EEA Level 2 event on that date.

For the events on August 2-5, 2011, the RC promptly declared appropriate Advisories, Watches, and ultimately the EEA, as the PRC level dropped below the benchmark levels for the issuance of such Advisories, Watches, and EEA.

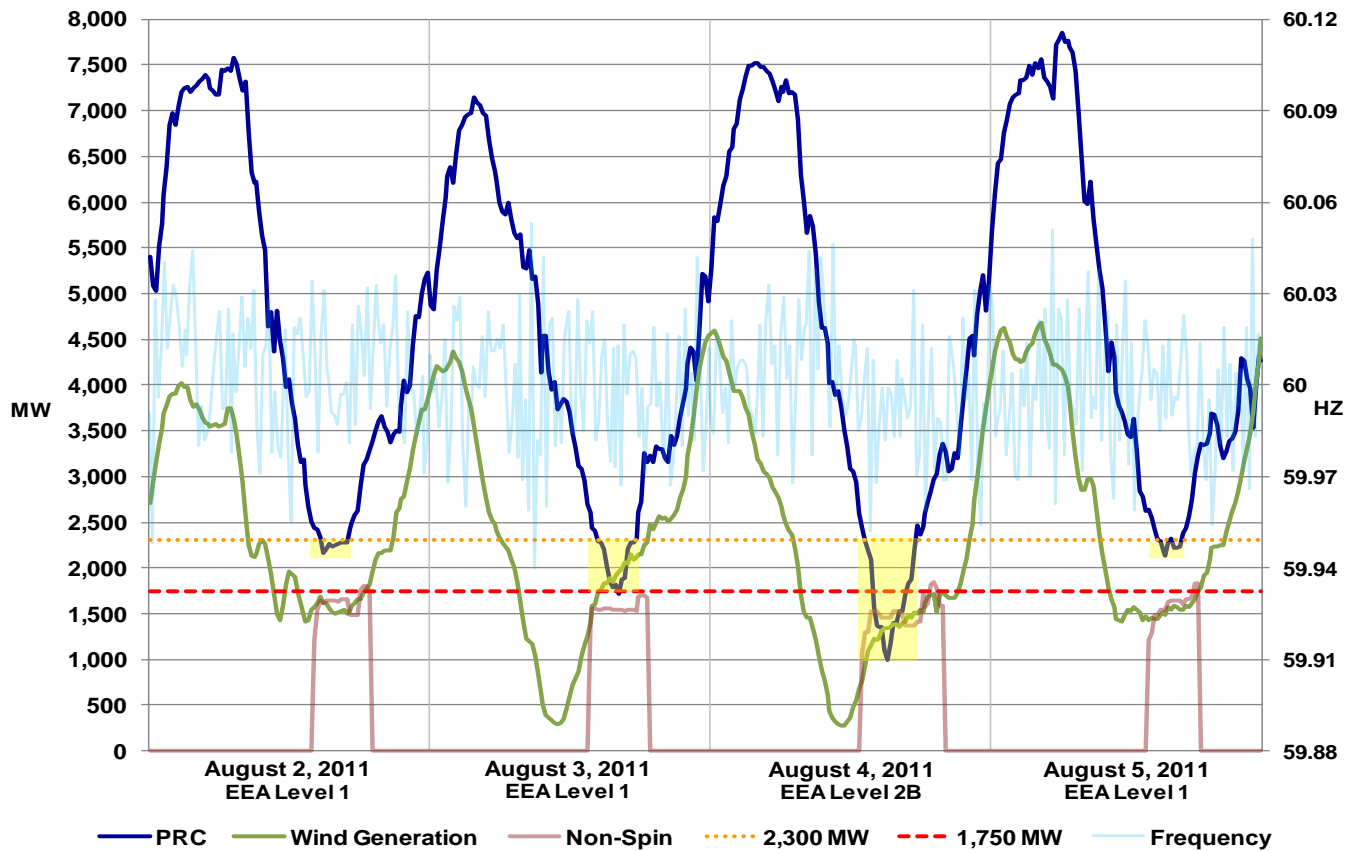


Figure 3: PRC, Wind Generation, and Non-Spin Generation for August 2-5, 2011

Date	EEA Level	Non-Spin	Wind Max/Min MW	Import Across DC Ties MW	Lowest PRC Level MW
Aug 2	1	1,657 MW	1,697/1,441	840	2123
Aug 3	1	1,392 MW	2,233/1,690	763	1722
Aug 4	2B	1,392 MW	1,576/939	981	984
Aug 5	1	1,657 MW	1,647/1,417	998	2122

Table 1: Non-Spin Generation, Wind Generation, DC Tie and PRC data for August 2-5, 2011

The EEA Level 2 conditions on August 4 were created by an additional 1300 MW of unavailable generation capacity when compared to August 3. The amount of off-line generation during the EEA events is shown in the following table. The snapshot of off-line generating capacity was taken at the time that the EEA Level 1 was declared.

Date	EEA Level	Time	ERCOT Max Off-Line Capacity (HSL) MW during the EEA				Max Off-Line Capacity
			Forced	Maintenance	Derated	Planned	
Aug 2	1	2:40pm	3,187.19	0	379	58.44	3,624.63
Aug 3	1	2:51pm	3,363.19	0	501	58.44	3,922.63
Aug 4	2B	1:46pm	4,454.19	0	717	58.44	5,229.63
Aug 5	1	3:10pm	3,487.19	423	321	58.44	4,289.63

Table 2: Off-Line Generation data for August 2-5, 2011

The RC obtained and used available resources from neighboring RC areas through the DC ties in response to the EEA events. A maximum import of 998 MW was obtained on August 5. The chart below shows the DC tie flows during the period of August 2-5.

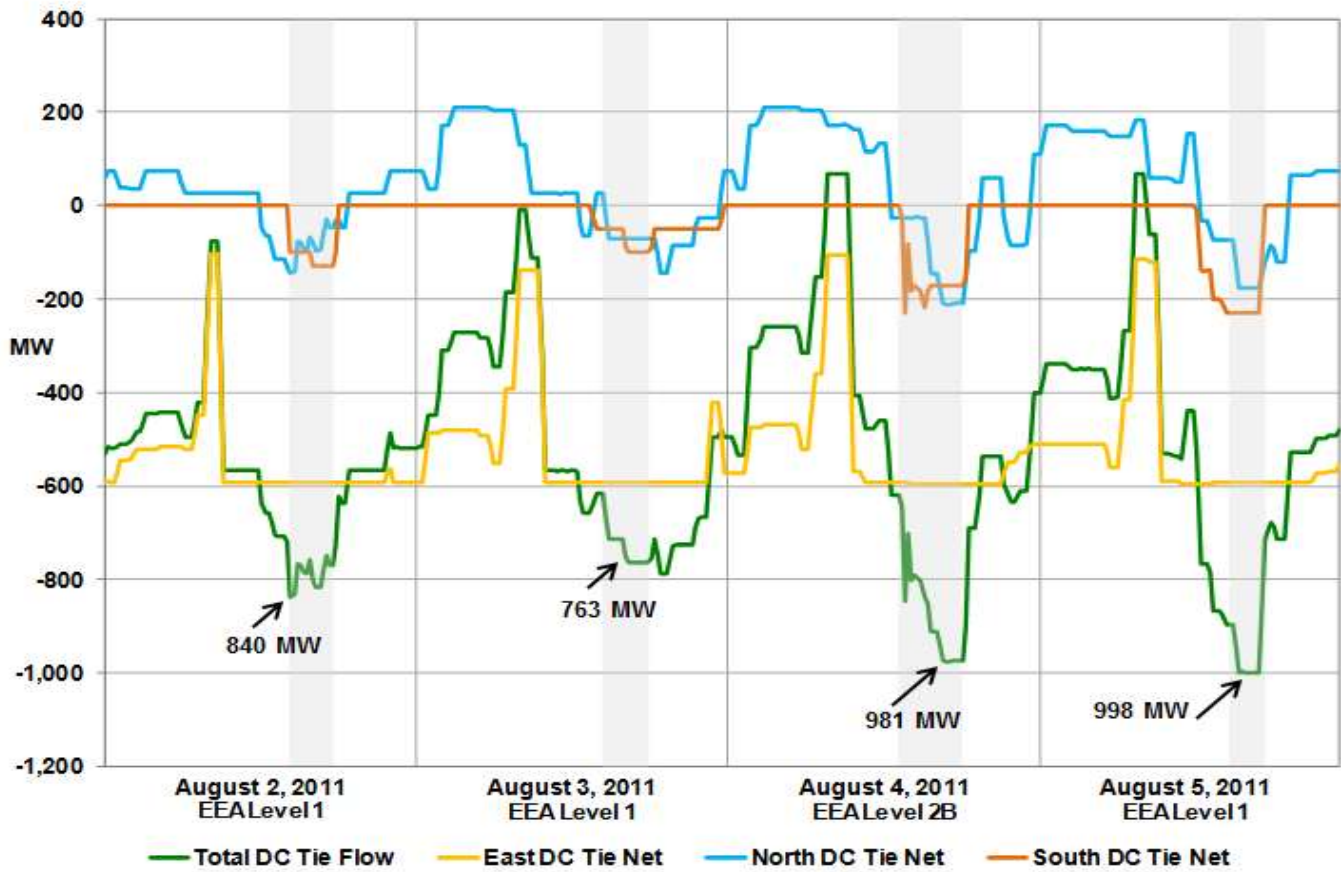


Figure 4: DC Tie Flows for August 2-5, 2011

Non-Controllable Load Resources (NCLR) were manually deployed on August 4, 2011 at 14:30 when the RC declared EEA Level 2A. The chart below shows the NCLR load performance.



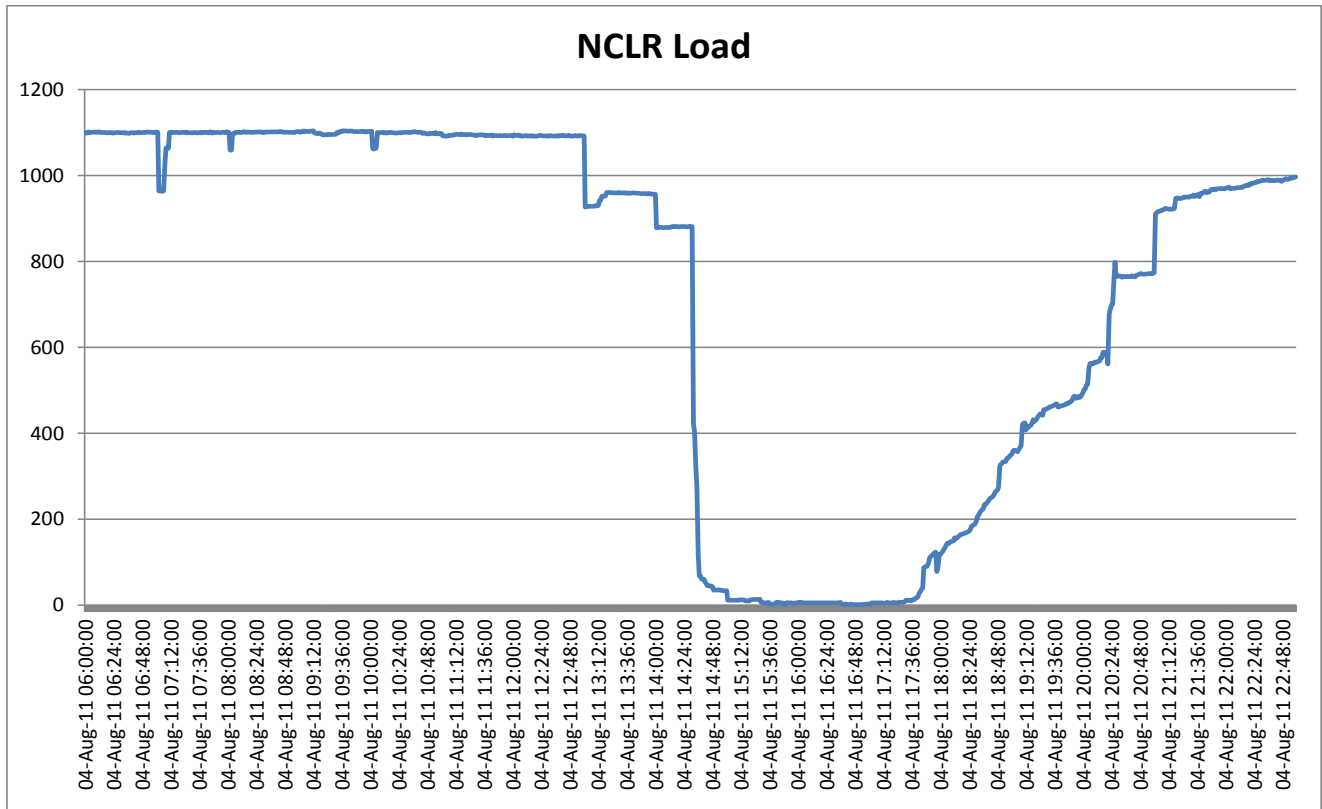


Figure 5: NCLR Load Performance for August 4, 2011

## V. Response Analysis

The extreme temperatures in the ERCOT Region on August 2-5, 2011 constituted a significant reliability concern to grid operations. The BA used the Region’s resources and reserves to balance resources and demand, and maintain system frequency during the EEA conditions.

As stated previously, for the events on August 2-5, 2011, the RC promptly declared appropriate Advisories, Watches, and ultimately the EEA, as the PRC level dropped below the benchmark levels for the issuance of such Advisories, Watches, and EEA.

At the time of this event, the declared most severe single contingency in the ERCOT Region per NERC BAL-002-0 is 1375 MW. During the EEA Level 2 on August 4, 2011, the PRC levels fell below the 1375 MW level for approximately 83 minutes. During this time, the ERCOT Region was not secure for the most severe single contingency.

## **VI. Conclusions and Recommendations**

In general, the steps taken in the recovery from these events achieved the desired results.