

# Texas Reliability Entity Event Analysis

## Event: Summary of EEA Events 8/23/2011-8/24/2011

Texas Reliability Entity  
September 13, 2011

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## Executive Summary

On August 23 and August 24, 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 5.4 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 24, 2011, the RC declared an EEA Level 2 after PRC levels dropped below the 1750 MW level. Non-Controllable Load Resources (NCLR) loads were deployed by the RC in response to the EEA-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 23-24, 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 23	1	3:43/5:17pm	1h 34min	67,136 MW HE 17	60.030/59.956	N/A	N/A
Aug 24	2A	2:18/6:08pm	3h 50min	66:552 MW HE 17	60.057/59.944	634 MW**	N/A

\*\* 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

	8/23/2011	8/24/2011
System Projected Peak Load	66678	66794
System Generation Capacity	66344	65960

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

Austin	103	103
DFW	103	105
Houston	100	100
San Antonio	99	102
Brownsville	96	96

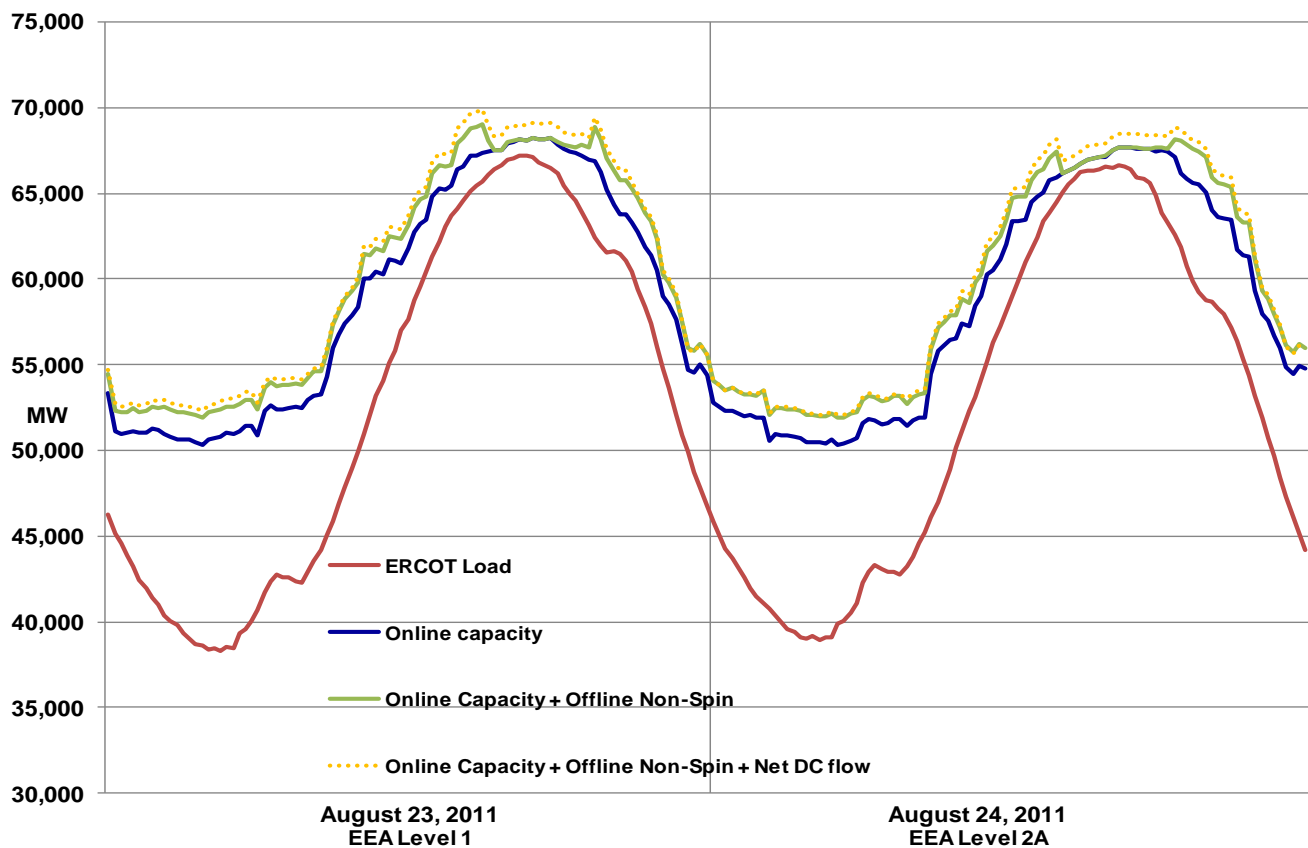
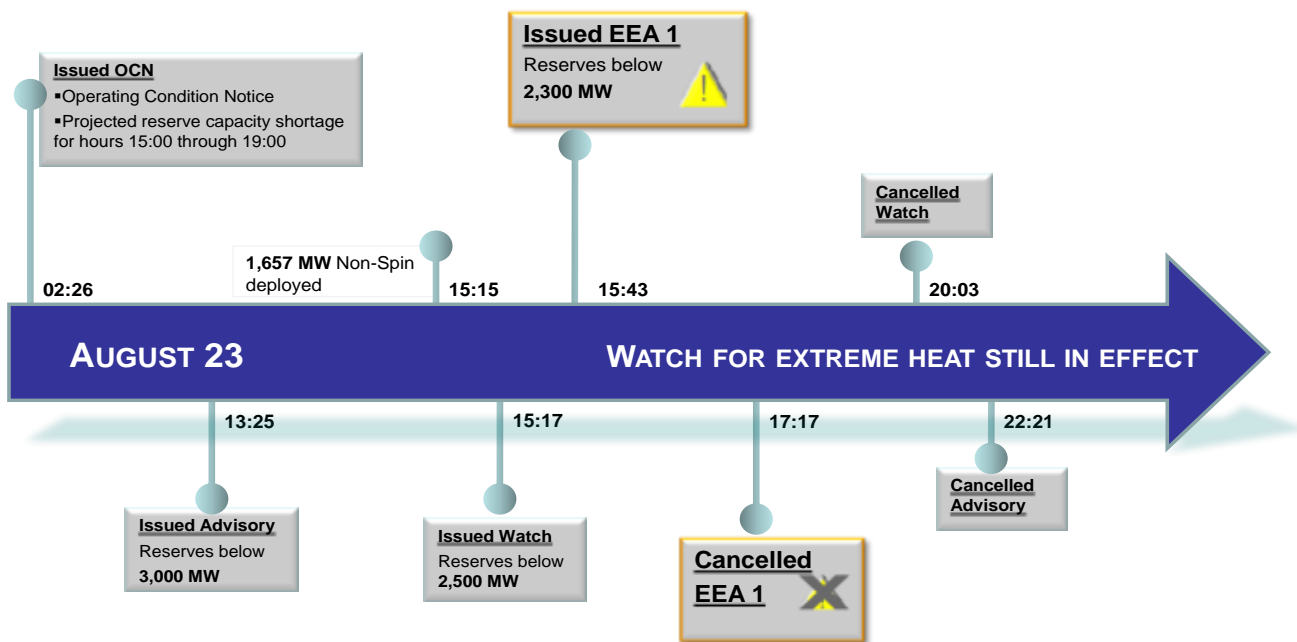


Figure 1: Load, Capacity, and Frequency for August 23-24, 2011

### III. Sequence of Events on 08/23/2011-08/24/2011

#### August 23, 2011

- **02:26** - ERCOT issues an Operating Condition Notice (OCN) for a Projected Reserve Capacity shortage for hours 15:00 through 19:00.
- **10:48** - ERCOT issues a Watch for Projected Reserve Capacity shortage with no Market solution available. RMR Resources are committed.
- **13:25** - ERCOT issues an Advisory for PRC below 3,000 MW.
- **15:15** - 1,657 MW of Non-Spin deployed.
- **15:17** - ERCOT issues a Watch for PRC below 2,500 MW.
- **15:43** - ERCOT declares EEA Level 1 due to PRC dropping below 2,300 MW. ERCOT receives 856 MW across the DC Ties.
- **17:17** - EEA Level 1 is cancelled. The duration of the EEA was 1 hour and 34 minutes.
- **20:03** - Watch is cancelled.
- **22:21** - Advisory is cancelled.



#### August 24, 2011

- **02:57** - ERCOT issues an OCN for a Projected Reserve Capacity shortage for hours 15:00 through 20:00.
- **08:45** - ERCOT issues a Watch for Projected Reserve Capacity shortage with no Market solution available. RMR Resources are committed.
- **12:51** - ERCOT issues an Advisory for PRC below 3,000 MW.

- **14:03** - ERCOT issues a Watch for PRC below 2,500 MW.
- **14:08** - 1,657 MW of Non-Spin is deployed.
- **14:18** - ERCOT declares EEA Level 1 due to PRC falling below 2,300 MW.
- **15:08** - ERCOT declares EEA Level 2A due to PRC falling below 1,750 MW.
- **15:10** - ERCOT System Operators complete deployment instructions for Load Resources assigned to Group 1. Group 1 Load Resources responsible for 617.7 MW.
- **17:23** - ERCOT System Operators recall all Load Resources.
- **17:26** - ERCOT moves to EEA Level 1 from EEA Level 2A.
- **18:08** - ERCOT cancels EEA Level 1.
- **18:56** - Watch cancelled.
- **19:37** - Advisory cancelled.

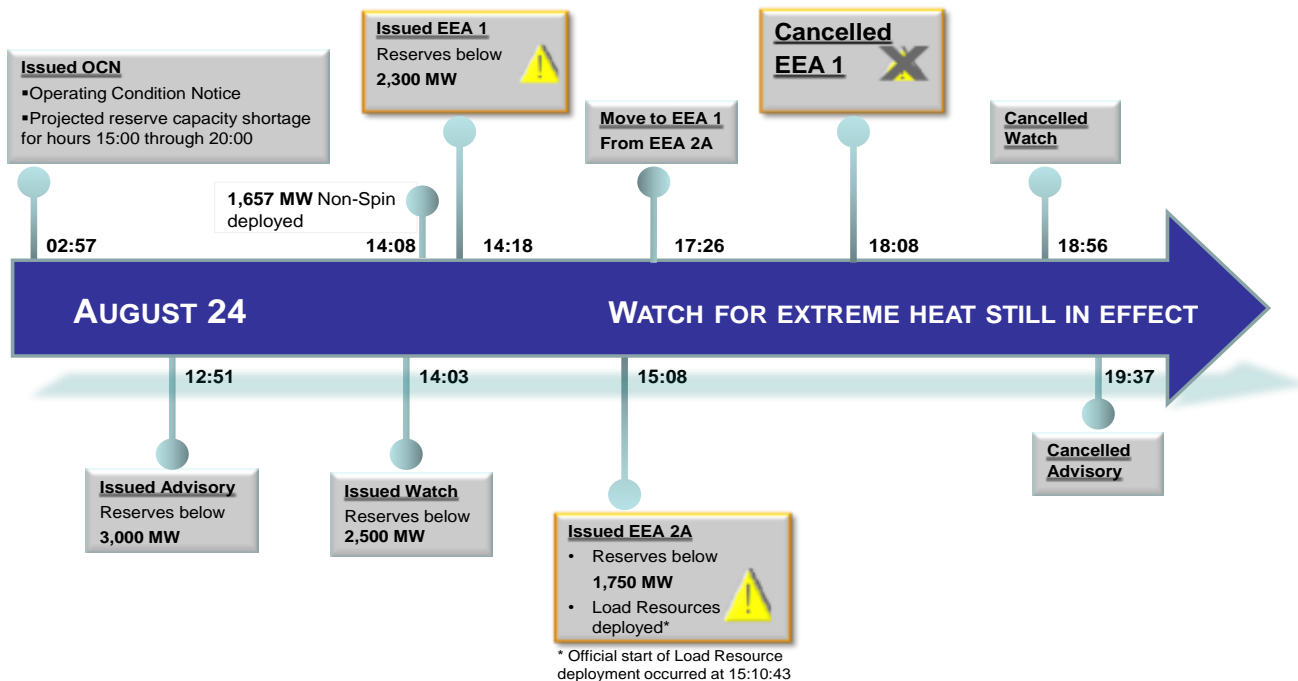


Figure 2: EEA Timelines for August 23-24, 2011

## IV. Analysis of Events

The EEA events experienced in the ERCOT Region on August 23-24, 2011 were due to the combination of extreme temperatures, high loads, generation outages due to maintenance and repair, and decreased wind generation.

For the events on August 23-24, 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.

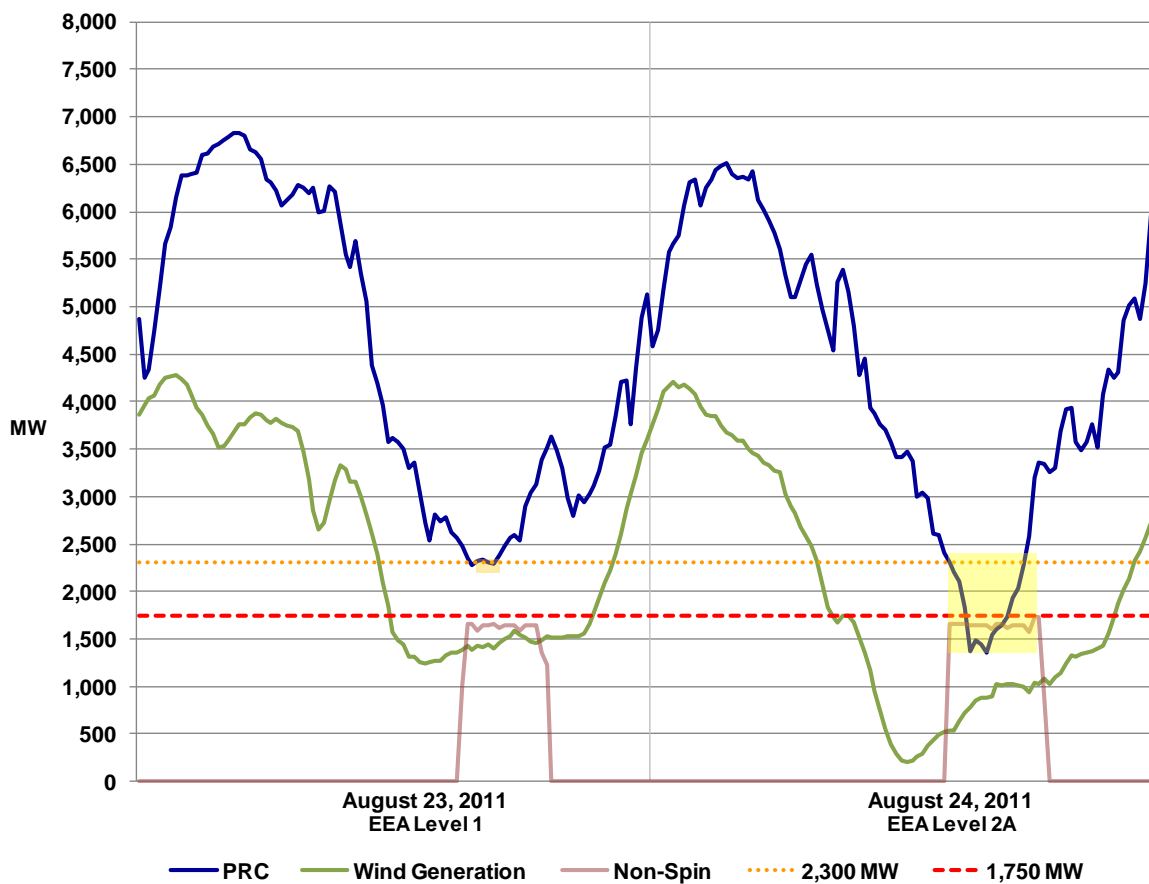


Figure 3: PRC, Wind Generation, and Non-Spin Generation for August 23-24, 2011

Date	EEA Level	Non-Spin	Wind Max/Min MW	Import Across DC Ties MW	Lowest PRC Level MW
Aug 23	1	1657 MW	1512/1200	856	2260
Aug 24	2A	1657 MW	1049/519	809	1192

Table 1: Non-Spin Generation, Wind Generation, DC Tie and PRC data for August 23-24, 2011

The EEA Level 2 conditions on August 24 were created by an additional 460 MW of unavailable generation capacity when compared to August 23. 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	ERCOT Max Off-Line Capacity (HSL) MW during the EEA					
		Time	Forced	Maintenance	Derated	Planned	Max Off-Line Capacity
Aug 23	1	3:43pm	3960	0	687	200	4847
Aug 24	2A	2:18pm	4417	0	690	200	5307

Table 2: Off-Line Generation data for August 23-24, 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 856 MW was obtained on August 23. The chart below shows the DC tie flows during the period of August 23-24.



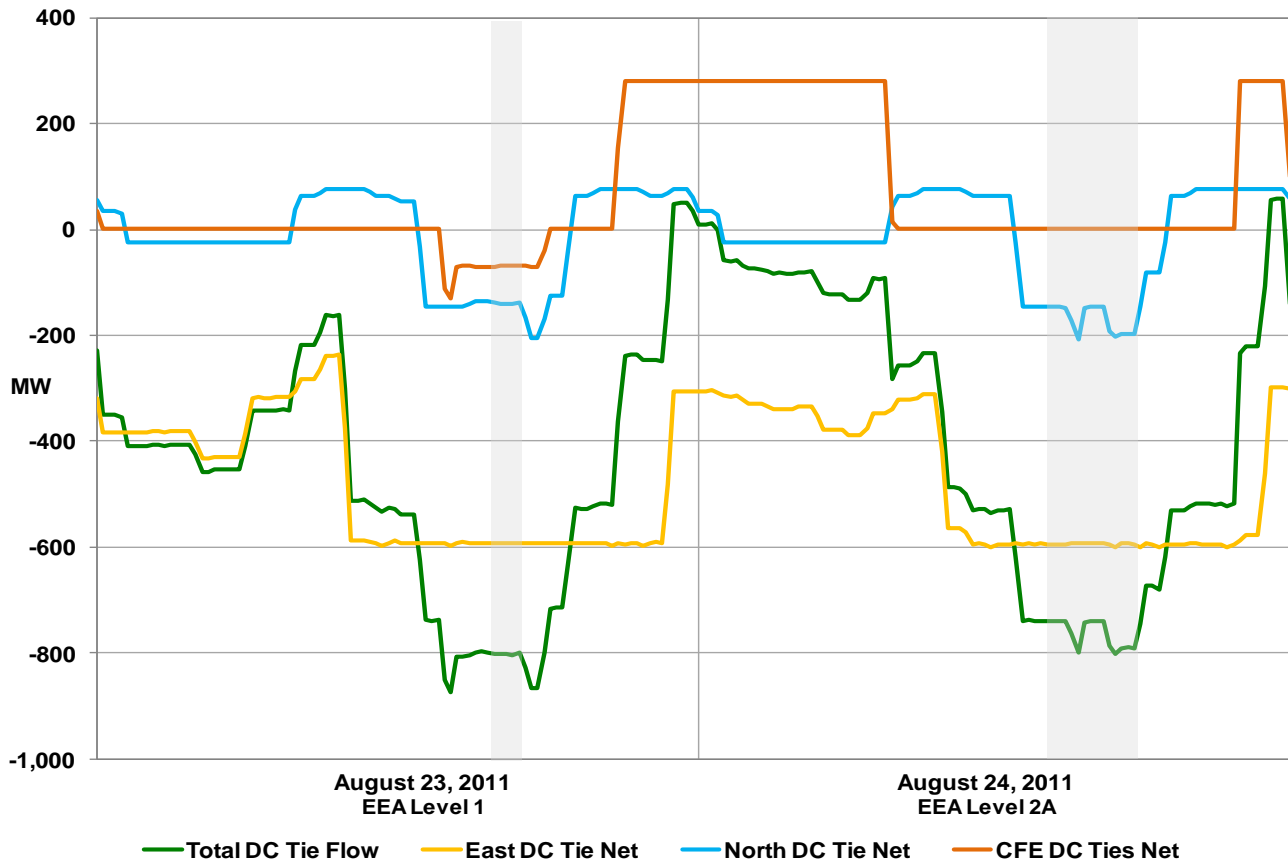


Figure 4: DC Tie Flows for August 23-24, 2011

Non-Controllable Load Resources (NCLR) were manually deployed on August 24, 2011 at 15:10 after the RC declared EEA Level 2A. The chart below shows the NCLR load performance.

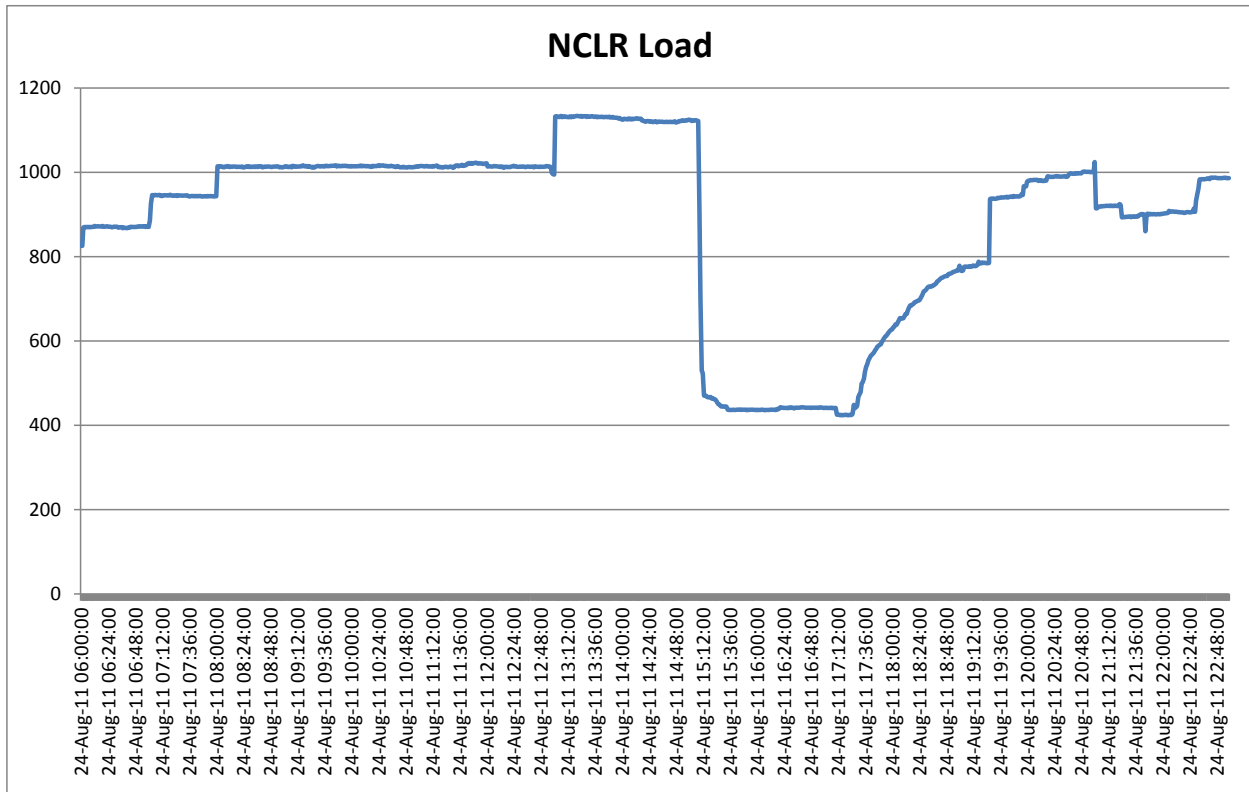


Figure 5: NCLR Load Performance for August 24, 2011

## V. Response Analysis

The extreme temperatures in the ERCOT Region on August 23-24, 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 23-24, 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 24, 2011, the PRC levels fell below the 1375 MW level for approximately 15 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.