2004 - Disturbance Index - Public

Date	Region	Utilities	Type	MW	Customers	Cause
08-Jan-04	NPCC-NYISO	NYIS	PA	100	18,600	Public Appeal
11-Jan-04	WECC-RMPA	WACM	UO	96	N/A	System Protection - Malfunction
23-Jan-04	NPCC-NYISO	NYIS	PA	100	18,600	Public Appeal
26-Jan-04	NPCC-NYISO	NYIS	VR	100	18,600	Voltage Reduction
26-Jan-04	SERC	SCEG	INT	700	150,000	Weather - Ice Storm
26-Jan-04	SERC-Southern	SC	INT	150	30,689	Weather - Ice Storm
26-Jan-04	SERC	SCEG	INT	475	92,000	Weather - Ice Storm
28-Jan-04	MAAC	PJM	INT	300	65,000	Weather - Icing
14-Feb-04	NPCC-NYISO	NYIS	PA	30	N/A	Public Appeal
26-Feb-04	SERC-Southern	SOCO	INT	na	61,284	Weather - High Winds and Thunder
26-Feb-04	WECC-NWPP	AESO	UO	180	N/A	Weather - Fog and Hoarfrost
04-Mar-04	ERCOT	ERCO	INT	na	41,000	Weather - High Winds - Possible Tornado
08-Mar-04	WECC-CAMX	CISO	INT	460	70,000	Human Error
17-Mar-04	WECC-AZNMSNV	EPE	INT	300	100,000	Equipment Failure
18-Mar-04	WECC-NWPP	BCTC	INT	78	74,000	Equipment Failure
23-Mar-04	WECC-RMPA	WACM	INT	135	N/A	Equipment Failure - Misoperation
02-Apr-04	ECAR	PJM	UO	0	0	Third Party Contact
11-Apr-04	SERC-Entergy	EES	UO	0	0	SCADA Failure - Computer Trouble
12-Apr-04	FRCC	FPL	INT	250	179,000	Weather - Lightning and High Winds
28-Apr-04	NPCC-Maritimes	NBPwr	INT	245	97,500	System Protection - Conductor Sagging
17-May-04	NPCC-Quebec	HQT	INT	0	0	Maintenance Error - Inadvertant Tripping
19-May-04	NPCC-Quebec	HQT	INT	0	0	System Protection
22-May-04	MAPP	NPPD	INT	40	N/A	Weather - Thunderstorm and Tornados
28-May-04	FRCC	SEC	PA	0	50,000	Public Appeal - Inadequate Resources
28-May-04	SERC-Southern	SC	UO	0	0	Cyber Attack
01-Jun-04	ERCOT	ERCO	INT	n/a	500,000	Weather - Lightning and High Winds
12-Jun-04	MAPP	LES	INT	428	120,212	Weather
14-Jun-04	WECC-AZNMSNV	AZPS	INT	492	41,000	Equipment Failure - System Protection Malfunction

Date	Region	Utilities	Type	MW	Customers	Cause
23-Jun-04	WECC-RMPA	IPCO	UO	157	35,000	System Protection - Unknown
23-Jun-04	SERC-Southern	SOCO	INT	50	50,595	Weather - Thunderstorm - Severe
04-Jul-04	WECC-AZNMSNV	AZPS	UO	0	0	Equipment Failure
05-Jul-04	NPCC-Quebec	HQT	UO	1778	175,000	Maintenance Error
07-Jul-04	SERC-VACAR	VAP	INT	120	8,110	Weather - Thunderstorms - Severe
13-Jul-04	FRCC	TAL	INT	283	42,122	System Protection
20-Jul-04	WECC-AZNMSNV	AZPS	INT	250	50,000	Equipment Failure
21-Jul-04	MAIN	CE	INT	N/A	200,000	Weather - Thunderstorm and High Winds
24-Jul-04	SERC-Entergy	EES	PA	N/A	N/A	Public Appeal
25-Jul-04	SERC-Southern	SOCO	INT	N/A	61,004	Weather
01-Aug-04	SPP	EES	PA	0	0	Public Appeal
02-Aug-04	SPP	EES	PA	0	0	Public Appeal
03-Aug-04	SPP	Ees	PA	0	0	Public Appeal
04-Aug-04	WECC-CAMX	CISO	INT	480	171,600	Equipment Failure
10-Aug-04	WECC-AZNMSNV	WALC	UO	40	3	Fires - Brush Fire
13-Aug-04	FRCC	SEC	INT	700	200,000	Weather - Hurricane Charley
13-Aug-04	FRCC	FPL	INT	N/A	400,000	Weather - Hurricane Charley
14-Aug-04	SERC-VACAR	CPLE	INT	500	94,000	Weather - Hurricane Charley
18-Aug-04	ERCOT	ERCO	UO	178	2	Human Error
20-Aug-04	NPCC-ISO-NE	ISNE	VR	N/A	27,388	Weather - Lightning
29-Aug-04	SERC	SCEG	INT	N/A	125,000	Weather - Tropical Storm Gaston
30-Aug-04	WECC-NWPP	AESO	UO	0	0	Maintenance Error
30-Aug-04	SERC-VACAR	VAP	INT	150	99,816	Weather - Tropical Storm Gaston
04-Sep-04	FRCC	FPL	INT	N/A	1,807,881	Weather - Hurricane Frances
06-Sep-04	SERC-Southern	SOCO	INT	3000	556,383	Weather - Hurricane Frances
15-Sep-04	SERC-Southern	SOCO	INT	1,364	1,536,433	Weather - Hurricane Ivan
16-Sep-04	SERC	AEC	INT	N/A	75,000	Weather - Hurricane Ivan
18-Sep-04	SERC	CPLE	INT	400	112,000	Weather - Hurricane Ivan
25-Sep-04	FRCC	FPL	INT	6000	1,700,000	Weather - Hurricane Jeanne
27-Sep-04	SERC-Southern	SOCO	INT	854	85,455	Weather - Hurricane Jeanne
17-Oct-04	WECC-RMPA	PACE	UO	0	0	System Protection - Malfunction
25-Oct-04	SERC-Entergy	EES	PA	0	0	Public Appeal
30-Oct-04	ECAR	MECS	INT	60	117,842	Weather - High Winds
05-Nov-04	SERC-Entergy	EES	UO	0	0	EMS Computer Failure

Date	Region	Utilities	Type	MW	Customers	Cause
07-Nov-04	MAPP-Canada	MHEB	UO	0	0	SPS Misoperation
12-Nov-04	ECAR	CIN	UO	0	0	EMS Computer Failure
14-Nov-04	NPCC-Maritimes	NSPwr	INT	600	132,000	Weather - Snow Storm - Severe
20-Nov-04	SPP	EES	UO	0	0	EMS Computer Failure
23-Nov-04	WECC-NWPP	BCTC	UO	370	88,775	Equipment Failure
24-Nov-04	SERC-Southern	SOCO	INT	100	83,450	Weather - Thunderstorms
30-Nov-04	WECC-AZNMSNV	AZPS	UO	0	0	Maintenance Error

2004 - Number of Disturbances by Region - Public

Region	Disturbances
ECAR	3
ERCOT	3
FRCC	7
MAAC	1
MAIN	1
MAPP	2
MAPP-Canada	1
NPCC-ISO-NE	1
NPCC-Maritimes	2
NPCC-NYISO	4
NPCC-Quebec	3
SERC	5
SERC-Entergy	4
SERC-Southern	9
SERC-VACAR	3
SPP	4
WECC-AZNMSNV	6
WECC-CAMX	2
WECC-NWPP	4
WECC-RMPA	4
Total Number of Disturbances:	**69**

2004 - Disturbance Reports - Public

Region: NPCC **Control Area ID:** NYIS

Date - Time: 1/8/2004 3:00:00 PM EST **Year:** 2004 **Type:** PA

Utility: New York Independent System Operator

Category: Public Appeal **Cause:** Public Appeal

Event Description:

From about 15:00 EST on 1/8/2004 to about 19:00 EST on 1/10/2004 a utility company made public appeals for electric customers to reduce loads due to forecasted low temperatures of -30 degrees Fahrenheit in upper New York State.

2004 - Disturbance Reports - Public

Region: WECC-RMPA **Control Area ID:** WACM

Date - Time: 1/11/2004 8:46:00 AM MST **Year:** 2004 **Type:** UO

Utility: Western Area Power Administration - CM

Category: Sys. Prot. **Cause:** System Protection - Malfunction

Event Description:

On 1/11/2004 at about 08:46 MST, system protection removed from service three high voltage transmission lines due to a fault on a distribution bus that failed to clear properly. At about 09:00 MST, system protection removed from service another high voltage transmission line. At about 09:01, system protection removed from service a fifth high voltage transmission line. The five transmission lines emanated from the same substation. As a result of this event, approximately 96 MW of customer load was lost. In addition, a single wind generator carrying about 1.5 MW was removed from service. By 10:16 all transmission lines were returned to normal and all customer loads restored. The initial fault on the distribution bus was caused by an animal contact. The fault failed to properly clear by system protection and persisted for 15-minutes.

2004 - Disturbance Reports - Public

Region: NPCC **Control Area ID:** NYIS

Date - Time: 1/23/2004 3:00:00 PM EST **Year:** 2004 **Type:** PA

Utility: New York Independent System Operator

Category: Public Appeal **Cause:** Public Appeal

Event Description:

From about 15:00 EST on 1/23/2004 to about 12:00 EST on 1/25/2004 a utility company made public appeals for electric customers to reduce loads due to forecasted low temperatures of -30 degrees Fahrenheit in upper New York State.

2004 - Disturbance Reports - Public

Region: NPCC **Control Area ID:** NYIS

Date - Time: 1/26/2004 7:30:00 AM EST **Year:** 2004 **Type:** VR

Utility: New York Independent System Operator

Category: Voltage Reduction **Cause:** Voltage Reduction

Event Description:

From about 0730 to 10:30 EST on 1/26/2004 to about 19:00 EST, a utility company implemented a 5% voltage reduction to reduce electric demand due to area temperatures that were much lower than originally forecasted. The voltage reduction was terminated at 10:30 EST and no further actions were required.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SCEG

Date - Time: 1/26/2004 10:00:00 AM EST **Year:** 2004 **Type:** INT

Utility: South Carolina Electric & Gas Company

Category: Weather **Cause:** Weather - Ice Storm

Event Description:

At about 1000 on January 26, 2004 a severe winter storm caused icing conditions that led to the loss of 500 to 700 MW of electric customer load. Service to approximately 150,000 electric customers was interrupted by this storm. All service to electric customers had been restored by 1200 EST on January 30, 20004.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SC

Date - Time: 1/26/2004 2:00:00 PM EST **Year:** 2004 **Type:** INT

Utility: Southern Company

Category: Weather **Cause:** Weather - Ice Storm

Event Description:

On 1/26/2004 at about 14:00 EST, a winter storm in North and Central Georgia caused severe icing on trees and power lines, which resulted in the loss of about 150 MW of electric customer load. Service to approximately 30,689 electric customers was interrupted by this this storm. (Need final restoration times)

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SCEG

Date - Time: 1/26/2004 4:00:00 PM EST **Year:** 2004 **Type:** INT

Utility: South Carolina Electric & Gas Company

Category: Weather **Cause:** Weather - Ice Storm

Event Description:

On 1/26/2004 at about 16:04, a severe winter ice storm, in Central, Southern, and Eastern parts of North and South Carolina, caused the loss of about 475 MW of electric customer load. Service to approximately 92,000 electric customers was interrupted by this this storm. Restoration in the hardest hit areas is expected to take several days. (Need restoration times)

2004 - Disturbance Reports - Public

Region: MAAC **Control Area ID:** PJM

Date - Time: 1/28/2004 1:09:00 PM EST **Year:** 2004 **Type:** INT

Utility: PJM Interconnection

Category: Weather **Cause:** Weather - Icing

Event Description:

On 1/28/04 at about 13:09 EST, system protection removed from service two high voltage transmission lines as a result of galloping conductors, which was due to ice buildup and high winds. Service to approximately 65,000 electric customers was interrupted by this storm. All transmission lines were returned to service by 13:15 EST. Electric service to all customers was restored by 2048 EST.

2004 - Disturbance Reports - Public

Region: NPCC **Control Area ID:** NYIS

Date - Time: 2/14/2004 8:00:00 PM EST **Year:** 2004 **Type:** PA

Utility: New York Independent System Operator

Category: Public Appeal **Cause:** Public Appeal

Event Description:

On February 14, 2004 at 20:00 EST, Niagara Mohawk initiated a public appeal to customers to reduce electric use due to inadequate electric resourced to serve load. The public appeal was terminated at 12:00 on 2/16/04.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SOCO

Date - Time: 2/26/2004 12:00:01 AM EST **Year:** 2003 **Type:** INT

Utility: Southern Company Services, Inc.

Category: Weather **Cause:** Weather - High Winds and Thunder

Event Description:

On February 26, 2004 at about 0000, high winds and severe thunder storms caused widespread interruptions to the electric service of approximately 61,284 customers. (Need final restore time)

2004 - Disturbance Reports - Public

Region: WECC-NWPP **Control Area ID:** AESO

Date - Time: 2/26/2004 11:22:00 PM MST **Year:** 2004 **Type:** UO

Utility: Alberta Electric System Operator

Category: Weather **Cause:** Weather - Fog and Hoarfrost

Event Description:

On February 26, 2004 at 2322 MST, system protection removed from service several high voltage transmission lines, a section of bus and a step-down transformer at a transmission substation. In addition, system protection removed from service a high voltage transmission tie line separating the affected system from the Western Interconnection. In addition, system protection removed from service various generating units totally 118 MW of generation and 180 MW of firm customer loads due to voltage deviations. The cause of these events was high fog and hoarfrost in the region.

At 2344, the islanded system was resynchronized with the Interconnection. At about 0836 MST on February 27, 2004, all generating units and customer electric service had been restored.

2004 - Disturbance Reports - Public

Region: ERCOT **Control Area ID:** ERCO

Date - Time: 3/4/2004 3:06:00 PM CST **Year:** 2004 **Type:** INT

Utility: ERCOT ISO

Category: Weather **Cause:** Weather - High Winds - Possible Tornado

Event Description:

On March 4, 2004 at 15:06 CST, system protection removed from service three sets of high voltage double circuits due to high winds and a possible tornado. Each set of double circuits was importing into a metropolitan area approximately 250 MW. At about 16:33 system protection removed from service two additional high voltage double circuits that were importing approximately 1155 MW into the same metropolitan area. As a result of these events the electric service to approximately 41,000 customers was interrupted.

(Need restoration times

2004 - Disturbance Reports - Public

Region: WECC-CAMX **Control Area ID:** CISO

Date - Time: 3/8/2004 5:50:00 PM PST **Year:** 2004 **Type:** INT

Utility: California Independent System Operator

Category: Human Error **Cause:** Human Error

Event Description:

At about 1750 PST on March 8, 2004, a control area requested that a local transmission operator shed approximately 160 MW of interruptible load and 300 MW of firm customer demand to decrease loading on an internal transmission path after de-dispatch of generation failed to alleviate the overload. All customer demand, both firm and interruptible, were restored by 1838 PST. The cause of this incident was do to a forecasting error and higher than expected ambient temperatures in the southern portion of the control area.

2004 - Disturbance Reports - Public

Region: WECC-AZNMSNV **Control Area ID:** EPE

Date - Time: 3/17/2004 1:27:00 PM MST **Year:** 2004 **Type:** INT

Utility: El Paso Electric

Category: Equipment Failure **Cause:** Equipment Failure

Event Description:

At about 1327 MST on March 17, 2004, a step-up transformer on a generating unit failed. This caused several high voltage transmission lines to be removed from service by system protection in the underlying transmission system. As a result of this incident, the local undervoltage relay scheme operated shedding approximately 300 MW of firm load. This caused the loss of electric service to about 100,000 customers. In addition, 60 MW of local generation and 10 MW of generation in a neighboring system was removed from service by system protection. All electric service and transmission lines were restored to service by 14:06 MST.

2004 - Disturbance Reports - Public

Region: WECC-NWPP **Control Area ID:** BCTC

Date - Time: 3/18/2004 9:18:00 AM PST **Year:** 2004 **Type:** INT

Utility: British Columbia Transmission Company

Category: Equipment Failure **Cause:** Equipment Failure

Event Description:

At about 0918 PST on March 18, 2004, system protection removed from service two high voltage transmission lines due to a tower failure caused by high winds. Prior to this event, another high voltage transmission line had been manually removed from service due to a broken cross arm because of the high winds. This sequence of events caused the loss of electric service to about 74,000 customers (78 MW of firm load.). By 1325 PST, all customer electric service had been restored.

2004 - Disturbance Reports - Public

Region: WECC-RMPA **Control Area ID:** WACM

Date - Time: 3/23/2004 5:37:00 PM MST **Year:** 2004 **Type:** INT

Utility: Western Area Power Administration - CM

Category: Equipment Failure **Cause:** Equipment Failure - Misoperation

Event Description:

At about 17:37 MST on March 23, 2004, system protection removed from service an existing high voltage step-down transformer while testing was in progress on a new high voltage transformer within the same substation. This incident cased system protection to remove from service two high voltage transmission lines emanating from this substation. As a result of the initial incident, about 30 MW of firm customer demand was lost. At about 17:52 system protection removed from service another high voltage transmission line in the area due to overload. As a result an additional 105 MW of firm customer demand was lost. All customer demand was restored by 19:26 MST. In addition to the firm customer demand lost, about 10 MW of local generation was removed from service by system protection.

2004 - Disturbance Reports - Public

Region: MAAC **Control Area ID:** PJM

Date - Time: 4/2/2004 1:17:00 PM EST **Year:** 2004 **Type:** UO

Utility: PJM Interconnection

Category: Third Party **Cause:** Third Party Contact

Event Description:

At 13:17 on April 2, 2004, system protection removed from service multiple high voltage transmission lines from service after a construction crane contacted one of the transmission lines adjacent to a substation. In addition, system protection removed a single generating unit carrying 210 MW. There were no customers affected by this event. (Need final restoration time for lines)

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** EES

Date - Time: 4/11/2004 11:49:00 AM CDT **Year:** 2004 **Type:** UO

Utility: Entergy

Category: SCADA Failure **Cause:** SCADA Failure - Computer Trouble

Event Description:

At about 1149 CDT on April 11, 2004, a Control Area's SCADA computer failed and did not transfer to the backup source. This disabled a portion of the control area's automatic load shedding scheme. There were no electric customers affected by this incident. By 1248 CDT, the SCADA computer had been fully restored.

2004 - Disturbance Reports - Public

Region: FRCC **Control Area ID:** FPL

Date - Time: 4/12/2004 5:30:00 AM EDT **Year:** 2004 **Type:** INT

Utility: Florida Power & Light

Category: Weather **Cause:** Weather - Lightning and High Winds

Event Description:

At about 0530 EDT on April 12, 2004, a series of thunderstorms with high winds gusting between 50 to 60 mph, caused a large number of distribution interruptions because of tree contacts, wires down and other problems. In addition, there were reports of possible tornado activity associated with the storm front. The storm moved west to east across the utility's service territory. There were approximately 179,000 electric customers affected by this storm, with a maximum of 90,000 customers without power at any one time.

At about 03:00 EDT on April 13, 2004, a second wave of strong thunderstorm activity moved across the utility's service territory, causing additional distribution interruptions. All customer electric service was restored by 2400 on April 13, 2004

2004 - Disturbance Reports - Public

Region: NPCC-Maritimes **Control Area ID:** NBPwr

Date - Time: 4/28/2004 9:27:00 AM ADT **Year:** 2004 **Type:** INT

Utility: New Brunswick Power Co.

Category: Sys. Prot. **Cause:** System Protection - Conductor Sagging

Event Description:

On April 28, 2004 at 0927 ADT, a high voltage transmission line sagged into a lower voltage under built transmission line, causing system protection to remove both transmission lines from service. This caused the interruption to electric service of 22,000 customers. In addition, because of a temporary reconfiguration of the transmission system, this incident also interrupted another 75,500 electric customers because of a single feed into another portion of the affected system. By 1026 ADT, all transmission lines and electric service to customers had been restored.

2004 - Disturbance Reports - Public

Region: NPCC-HQ **Control Area ID:** HQT

Date - Time: 5/17/2004 9:39:00 AM EDT **Year:** 2004 **Type:** INT

Utility: Hydro-Quebec, TransEnergie

Category: Maintenance Error **Cause:** Maintenance Error - Inadvertant Tripping

Event Description:

On Monday May 17, 2004 at about 0939 EDT, system protection inadvertently removed from service a high voltage step-up transformer and two generating units causing the loss of about 900 MW of generation. By 1032 EDT, the transformer and both generating units were restored to service. There was no customer affected by this incident. The cause of the incident is unknown.

2004 - Disturbance Reports - Public

Region: NPCC-HQ **Control Area ID:** HQT

Date - Time: 5/19/2004 12:01:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Hydro-Quebec, TransEnergie

Category: Sys. Prot. **Cause:** System Protection

Event Description:

On May 19, 2004 at about 1201 EDT, system protection removed from service a high voltage transformer. As a result of this incident, system protection subsequently removed from service a high voltage transmission line and three generating units. This caused the loss of about 750 MW of generation. There were no customers affected by this incident. The cause of this incident is unknown.

2004 - Disturbance Reports - Public

Region: MAPP **Control Area ID:** NPPD

Date - Time: 5/22/2004 6:57:00 PM CDT **Year:** 2004 **Type:** INT

Utility: Nebraska Public Power District

Category: Weather **Cause:** Weather - Thunderstorm and Tornados

Event Description:

Between 1857 and 2046 CDT on May 22, 2004, system protection removed from service several high voltage transmission lines due to severe thunderstorms and tornadoes throughout the service area of a public power district. In addition, this event caused the interruption to approximately 40 MW of firm electric customer load and the tripping of about 145 MW of area generation. There was extensive damage to several transmission lines and tower structures throughout the area affected. By 0917 CDT on May 23, 2004, most of the transmission system was normal, service to electric all customers, and all generating units had been restored. There remains out of service some transmission lines because of the extensive damage.

2004 - Disturbance Reports - Public

Region: FRCC **Control Area ID:** SEC

Date - Time: 5/28/2004 12:00:00 PM EDT **Year:** 2004 **Type:** PA

Utility: Seminole Electric Cooperative

Category: Public Appeal **Cause:** Public Appeal - Inadequate Resources

Event Description:

On May 28, 2004 at 12:00 EDT, a utility company made a public appeal to its electric customers to conserve energy due to a generation deficiency.

On June 1, 2004 at about 2400 EDT, the public appeals were terminated because the weather had moderated and additional generating resources became available within the affected area.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SC

Date - Time: 5/28/2004 4:21:00 PM EDT **Year:** 2004 **Type:** UO

Utility: Southern Company

Category: Cyber Failure **Cause:** Cyber Attack

Event Description:

At about 1621 EDT on May 28, 2004, a cyber attack disrupted the OASIS Transmission Reservation system At 1636, OASIS was normal. This event did not cause any distruption to service.

2004 - Disturbance Reports - Public

Region: ERCOT **Control Area ID:** ERCO

Date - Time: 6/1/2004 5:00:00 PM CDT **Year:** 2004 **Type:** INT

Utility: ERCOT ISO

Category: Weather **Cause:** Weather - Lightning and High Winds

Event Description:

On June 1, 2004 at about 1700 CDT, a severe storm, with lightning, heavy rain, hail and wind gusts of up to 80 mph, crossed a large metropolitan area in Texas. This storm caused severe damage to the electric system with numerous poles and wires down. This event caused interruption to the electric service of about 500,000 customers. Restoration efforts were assisted by neighboring utilities from as far as 750 miles from affected area.

As of about 1100 CDT on June 2, 2004, some 350,000 electric customers remained without service.

2004 - Disturbance Reports - Public

Region: MAPP **Control Area ID:** LES

Date - Time: 6/12/2004 5:37:00 PM CDT **Year:** 2004 **Type:** INT

Utility: Lincoln Electric System

Category: Weather **Cause:** Weather

Event Description:

On June 12, 2004 at about 1712 CDT, a severe storm, with possible tornados, caused extensive damage thought out the service area of a utility in Nebraska. Because of damage from a previous storm, there were widespread electric customer outages because of damage to both the transmission and distribution systems. About 120, 212 electric customers were interrupted because of this storm. Repairs to the transmission and distribution system will take several days to complete.

2004 - Disturbance Reports - Public

Region: WECC-AZNMSNV **Control Area ID:** AZPS

Date - Time: 6/14/2004 7:41:00 AM MST **Year:** 2004 **Type:** INT

Utility: Arizona Public Service Company

Category: Equipment Failure **Cause:** Equipment Failure - System Protection Malfunction

Event Description:

On June 14, 2004 at 0741 MST, system protection failed to properly clear a fault on a high voltage transmission line by primary and breaker failure relaying. Subsequently, the backup relaying failed, which caused the remote tripping of several high voltage transmission lines. In addition to the various transmission lines that tripped, several generating units were also removed from service by system protection. Approximately 4589 MW of generation was lost. Underfrequency load shedding of 492 MW occurred, which interrupted the electric service to about 41,000 customers. Much of the underfrequency load shedding occurred in nearby systems. On the disturbance, the Interconnection's frequency deviated from 59.999 Hz to 59.498 Hz and recovered to 59.925 Hz. The Interconnection's frequency returned to normal by 0757.

At about 0750, the regional Reliability Coordinator directed the affected system to manually shed firm load to recover its Area Control Error (ACE). Even though the affected system entered 500 MW into its load shedding program, the program failed to operate. However, about 200 MW of load reduction occurred because of the loss of induction motor loads within the affected system. The affected system received up to 800 Mw of emergency assistance from an adjacent control area.

All customer loads were restored within 45 minutes. The actual cause of the initial fault is under investigation

2004 - Disturbance Reports - Public

Region: WECC-NWPP **Control Area ID:** IPCO

Date - Time: 6/23/2004 5:35:00 PM CDT **Year:** 2004 **Type:** UO

Utility: Idaho Power Company

Category: Sys. Prot. **Cause:** System Protection - Unknown

Event Description:

On June 23, 2004 at about 1735 MDT, a utility company manually shed about 157 MW of firm customer load after system protection removed from service a high voltage transmission line and about 96 MW of local generation. Just before this occurred, another high voltage transmission line had been removed from service by system protection. The utility company shed load to maintain transmission security limits and to restore operating reserves. At 1752 MDT, local generation was restored. By 1910 MDT, restored all firm customer loads. The cause of this incident is unknown.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SOCO

Date - Time: 6/23/2004 7:00:00 PM CDT **Year:** 2004 **Type:** INT

Utility: Southern Company Services, Inc.

Category: Weather **Cause:** Weather - Thunderstorm - Severe

Event Description:

At about 1700 CDT, on June 23, 2004, a series of severe thunder storms caused the interruption of about 50,595 electric customers due to numerous distribution outages. Most of the customers affected were restored by 2000 CDT.

2004 - Disturbance Reports - Public

Region: WECC-AZNMSNV **Control Area ID:** AZPS

Date - Time: 7/4/2004 6:59:00 PM MST **Year:** 2004 **Type:** UO

Utility: Arizona Public Service Company

Category: Equipment Failure **Cause:** Equipment Failure

Event Description:

On July 4, 2004 at 1859 MST, system protection removed from service a high voltage step-down transformer due to an internal fault and resulting fire. As the smoke from the fire spread, three adjacent high voltage transformers were also removed from service by system protection. A high voltage transmission line, associated with one of these transformers, was also removed from service. No generation or electric service to customers was affected.

At 1945, a high voltage transmission line was manually removed from service to facilitate fire control activities on the affected transformer. When this high voltage line was de-energized, two generating units were removed from service by system protection. However, there was no loss of electric service to any customers.

2004 - Disturbance Reports - Public

Region: NPCC-HQ **Control Area ID:** HQT

Date - Time: 7/5/2004 5:18:00 PM EDT **Year:** 2004 **Type:** UO

Utility: Hydro-Quebec, TransEnergie

Category: Maintenance Error **Cause:** Maintenance Error

Event Description:

On July 5, 2004 at 1718 EDT, system protection removed from service several generating units by a Special Protection Scheme (SPS) when a false signal was injected into the dc portion of a protection relay during routine maintenance. This resulted in about 3,000 MW of generation being rejected and automatic load shedding of 1,500 MW being initiated. In addition to the automatic load shedding, another 375 MW of load was shed by underfrequency relaying. Because of this event, 175,000 electric customers were interrupted. All electric customers were restored by 1755.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** VAP

Date - Time: 7/7/2004 1:30:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Dominion Virginia Power

Category: Weather **Cause:** Weather - Thunderstorms - Severe

Event Description:

On July 7, 2004 at about 1330 EDT, severe thunderstorms moved across the service areas of a utility company causing widespread electric customer interruptions on the distribution system. About 88,110 electric customers were affected. By 1045, on July 8, 2004 EDT, most electric customers had been restored.

2004 - Disturbance Reports - Public

Region: FRCC **Control Area ID:** TAL

Date - Time: 7/13/2004 2:05:00 PM EDT **Year:** 2004 **Type:** INT

Utility: City of Tallahassee

Category: Sys. Prot. **Cause:** System Protection

Event Description:

On July 13, 2004 at 1405 EDT, system protection removed from service a single generating unit due to air/fuel runback. About 6 seconds later, a second generating unit at the same plant was removed from service by system protection. In addition, a non-company generating unit (being rented) tripped while carrying 52 MW. The total generation lost within the control area was 368 MW. The only remaining generation within the boundaries of this control area was a gas-turbine, loaded at about 10 MW. Earlier in the day, at about 1334, another generating unit carrying 235 MW had been removed from service by system protection due to exciter trouble. The loss of this generation, and due to tie-line loadings, the control area's voltage was now low.

While system operators were calling for operating reserves and purchasing additional imports, about 283 MW of firm customer load was manually shed to stabilize the transmission voltages. At about 1647, all generating units had been restored. At about 1715, all customer loads had been restored. A about 42,122 electric customers were without electric service starting at about 1414. In addition, two interruptible customers were shed

2004 - Disturbance Reports - Public

Region: WECC-AZNMSNV **Control Area ID:** AZPS

Date - Time: 7/20/2004 2:30:00 AM MST **Year:** 2004 **Type:** INT

Utility: Arizona Public Service Company

Category: Equipment Failure **Cause:** Equipment Failure

Event Description:

Before this incident occurred, a prior outage at a different facility required modifications in the system configuration, which resulted in the facility where this incident occurred to be on a single source of power.

On July 20, 2004 at 0230, system protection removed from service a high voltage step down transformer. Because of the system configuration, due to a previous incident, this caused the only power source into this substation to open. As a result, this de-energized the entire substation. The cause of the incident was a failed high-side transformer bushing. About 250 MW of firm customer load was interrupted. This interrupted the electric service to about 50,000 customers. All customer loads were restored by 0918. The faulted transformer was restored to service with a spare transformer.

2004 - Disturbance Reports - Public

Region: MAIN **Control Area ID:** CE

Date - Time: 7/21/2004 5:30:00 PM CDT **Year:** 2004 **Type:** INT

Utility: Commonwealth Edison

Category: Weather **Cause:** Weather - Thunderstorm and High Winds

Event Description:

On July 21, 2004 at about 17:30 a severe thunderstorm with high winds, gusting to about 60 mph, moved through the service area causing damage to the distribution system. This storm continued through on July 22, 2004. The electric service to about 200,000 customers was interrupted because of the damage caused by this storm. The majority of the customers interrupted had been restored by 1900 CDT on July 22, 2004.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** EES

Date - Time: 7/24/2004 3:45:00 PM EDT **Year:** 2004 **Type:** PA

Utility: Entergy

Category: Public Appeal **Cause:** Public Appeal

Event Description:

On July 24, 2004 at 1545 EDT, a utility company initiated public appeals for the conservation of electric useage due to transmission constraints across a critical transmission path. Generation re-dispatch and use of the transmission line load relief procedure was also used to mitigate this constraint. At 2200 EDT, the public appeal was cancelled. No firm customer demand was interrupted because of the constraint.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SOCO

Date - Time: 7/25/2004 10:00:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Southern Company Services, Inc.

Category: Weather **Cause:** Weather

Event Description:

On July 25, 2004 at 22:00 EDT, about 61,004 electric customers lost service due to the loss of a high voltage transmission line as a result of a storm. At 2300 EDT, the transmission line was returned to service and all customer loads restored.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** EES

Date - Time: 8/1/2004 11:00:00 AM CDT **Year:** 2004 **Type:** PA

Utility: Entergy

Category: Public Appeal **Cause:** Public Appeal

Event Description:

On August 1, 2004 from 11:00 to 20:00 EDT, a utility company issued public appeals for energy conservation due to the loss of generating capacity. No firm customer loads were interrupted. The utility did order its interruptable customers off line from 12:00 to 20:00 EDT.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** EES

Date - Time: 8/2/2004 10:00:00 AM CDT **Year:** 2004 **Type:** PA

Utility: Entergy

Category: Public Appeal **Cause:** Public Appeal

Event Description:

On August 2, 2004 from 11:00 to 20:00 EDT, a utility company issued public appeals for energy conservation due to the loss of generating capacity. No firm customer loads were interrupted. The utility did order its interruptable customers off line from 12:00 to 22:00 EDT.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** Ees

Date - Time: 8/3/2004 10:00:00 AM CDT **Year:** 2004 **Type:** PA

Utility: Entergy

Category: Public Appeal **Cause:** Public Appeal

Event Description:

On August 3, 2004 at 10:00 CDT, a utility issued a public appeals due to the unplanned generator outages and high loads. No firm customers load was interrupted.

2004 - Disturbance Reports - Public

Region: WECC-CAMX **Control Area ID:** CISO

Date - Time: 8/4/2004 12:46:00 PM PDT **Year:** 2004 **Type:** INT

Utility: California Independent System Operator

Category: Equipment Failure **Cause:** Equipment Failure

Event Description:

On August 4, 2004 at 1246 PDT, system protection removed from service a high voltage substation bus due to the internal failure of a circuit breaker. In addition, two high voltage transmission lines were also removed from service by system protection. The substation was in an off-normal configuration where the other bus was de-energized for station washing. This incident caused the dropping of about 480 MW of firm electric customer load, which affected about 171,600 electric customers. By 1350, the electric service had been restored to all customers. By 1357, both high voltage transmission lines had been restored.

2004 - Disturbance Reports - Public

Region: WECC-AZNMSNV **Control Area ID:** WALC

Date - Time: 8/10/2004 2:20:00 PM MST **Year:** 2004 **Type:** UO

Utility: Western Area Power Administration - DSW

Category: Fires **Cause:** Fires - Brush Fire

Event Description:

On August 10, 2004 at 1420 MST, system protection removed from service a high voltage transmission line due to a nearby fire. At about the same time, a two high voltage step down transformers were also removed from service by system protection due to high overcurrent. Because of this event, the bus voltage dropped to about 0.927 per unit. At 1422, an additional high voltage transmission line was manually removed from service due to the fire. This caused the bus voltage to decline further to 0.900 per unit.
Because of the declining voltages, about 40 MW of firm customer load was manually shed. Area voltages improved as a result of shedding load, however, did not fully recover. The control area system operator attempted to energize one of the high voltage step down transformers, but the transformer relayed again by what was believed to be high inrush currents. The control area system operator was eventually able to return both high voltage transformers to service. By 1815, all transmission lines were back in service. The shedding of 40 MW of firm customer load involved three customers only.

2004 - Disturbance Reports - Public

Region: FRCC **Control Area ID:** SEC

Date - Time: 8/13/2004 1:30:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Seminole Electric Cooperative

Category: Weather **Cause:** Weather - Hurricane Charley

Event Description:

On Augsut 13, 2004 at about 13:30 Hurricane Charley hit much of the western coast of Florida causing severe damage to the transmission and distrubition infrastructure. About 200,000 electric customers were interrupted.

2004 - Disturbance Reports - Public

Region: FRCC **Control Area ID:** FPL

Date - Time: 8/13/2004 3:00:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Florida Power & Light

Category: Weather **Cause:** Weather - Hurricane Charley

Event Description:

On August 13, 2004 at about 1500 EDT, Hurricane Charley made landfall on the west coast of Florida. The wind speeds were up to 145 mph. This caused major damage to the transmission and distribution infrastructure. By 1530, about 50,000 electric customers were without power. As the storm continued, additional transmission and distribution feeders tripped. By 1630, about 290,000 electric customers were without power. By 1945, the winds started to subside to a level where an assessment of the damage could begin. As a result of this storm a total of about 400,000 electric customers were left without power. Complete restoration is expected to take approximately two to three weeks in the west coast area with most electric services returned by 8/25/04 in the northern area.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** CPLE

Date - Time: 8/14/2004 1:00:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Carolina Power & Light Company - CPLE

Category: Weather **Cause:** Weather - Hurricane Charley

Event Description:

On August 14, 2004 at about 13:00 Hurricane Charley hit portions of Central and Eastern North Carolina and Eastern South Carolina causing wide-spread electric customer outages. At the peak of the storm more than 94,000 electric customers were interrupted. On 8/16/04 at about 12:00 all electric customers had been restored.

2004 - Disturbance Reports - Public

Region: ERCOT **Control Area ID:** ERCO

Date - Time: 8/18/2004 9:59:00 AM CDT **Year:** 2004 **Type:** UO

Utility: ERCOT ISO

Category: Human Error **Cause:** Human Error

Event Description:

2004 - Disturbance Reports - Public

Region: NPCC **Control Area ID:** ISNE

Date - Time: 8/20/2004 3:27:00 PM EDT **Year:** 2004 **Type:** VR

Utility: ISO New England Inc.

Category: Weather **Cause:** Weather - Lightning

Event Description:

On August 20, 2004 at about 1531 EDT, system protection removed from service a high voltage transmission line due to a lightning strike. This resulted in about 900 MW of generation runback. As a result of the generation deficiency in the area, the utility implemented a 5% voltage reduction that affected about 27,388 customers.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SCEG

Date - Time: 8/29/2004 9:52:00 AM EDT **Year:** 2004 **Type:** INT

Utility: South Carolina Electric & Gas Company

Category: Weather **Cause:** Weather - Tropical Storm Gaston

Event Description:

On August 29, 2004 at about 09:52 EDT, Tropical storm Gaston passed through South Carolina. Widespread disturbution outages were caused by this tropical storm with an estimate of about 125,000 electric customers being without power. Restoration efforts continued with the last elelctric customers being restored by 9/1/2004.

2004 - Disturbance Reports - Public

Region: WECC-NWPP **Control Area ID:** AESO

Date - Time: 8/30/2004 5:43:00 AM PDT **Year:** 2004 **Type:** UO

Utility: Alberta Electric System Operator

Category: Maintenance Error **Cause:** Maintenance Error

Event Description:

On August 30, 2004 at about 0538 PDT, system protection removed from service two high voltage transmission lines while a higher voltage transmission line was being removed from service for routine maintenance. With these three transmission lines out of service, the control area was separated from the Western Interconnection. There was no loss of customer load, system frequency swing, or any other facility affected. At 0558, the two high voltage transmission lines were returned to service, synchronizing the control area to the Interconnection.

At about 0705, a false metering signal from one of the terminals of the high voltage transmission line that was out of service for maintenance. This resulted in a false ACE signal. As the control area attempted to recover its ACE, system protection once again removed the same two high voltage transmission lines due to overloading, resulting in another separation from the Interconnection. At about 1034, the two high voltage transmission lines were returned to service, synchronizing the control area to the Interconnection again.

There was not customer load or any other facilities affected by these two incidents.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** VAP

Date - Time: 8/30/2004 6:58:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Dominion Virginia Power

Category: Weather **Cause:** Weather - Tropical Storm Gaston

Event Description:

On August 30, 2004 at about 1858 EDT, Tropical Storm Gaston caused widespread distribution outages within Virginia and North Carolina. Several high voltage transmission lines were removed from service by system protection and manual control of the utility's system operators. The storm had minimal affect in northern and western Virginia. As a result of this storm about 80,000 electric customers lost service.

2004 - Disturbance Reports - Public

Region: FRCC **Control Area ID:** FPL

Date - Time: 9/4/2004 8:00:00 AM EDT **Year:** 2004 **Type:** INT

Utility: Florida Power & Light

Category: Weather **Cause:** Weather - Hurricane Frances

Event Description:

On September 4, 2004 at about 0800 EDT, winds from Hurricane Frances started causing widespread outages with damage to the distribution system, and some high voltage transmission line outages. As of 2000 on 9/5/2004, about 1,807,881 electric customers were without power in Florida. Hurricane Francis moved slowly through the area and continued to cause damage for more than 24 hours.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SOCO

Date - Time: 9/6/2004 1:00:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Southern Company Services, Inc.

Category: Weather **Cause:** Weather - Hurricane Frances

Event Description:

On September 6, 2004 at about 1300 EDT, Hurricane Frances caused widespread outages in parts of Georgia. About556,383 electric customers were affected by this storm.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SOCO

Date - Time: 9/15/2004 7:00:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Southern Company Services, Inc.

Category: Weather **Cause:** Weather - Hurricane Ivan

Event Description:

On September 15, 2004 at about 1900 EDT, Hurricane Ivan caused widespread distribution outages due to damage sustained by high winds. About 1,536,433 electric customers were affected by this storm.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** AEC

Date - Time: 9/16/2004 2:00:00 AM EDT **Year:** 2004 **Type:** INT

Utility: Alabama Electric Cooperative, Inc.

Category: Weather **Cause:** Weather - Hurricane Ivan

Event Description:

On September 16, 2004 at 0200 EDT, Hurricane Ivan caused widespread distribution outages. There were approximately 75,000 electric service customers affected by this storm.

As of September 20, 2004 at 14:50 EDT, all electric customer service had been restored.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** CPLE

Date - Time: 9/18/2004 5:30:00 AM EDT **Year:** 2004 **Type:** INT

Utility: Carolina Power & Light Company - CPLE

Category: Weather **Cause:** Weather - Hurricane Ivan

Event Description:

On 9/18/2004 at about 0430 EDT, Hurricane Ivan caused widespread distrubtion outages. About 112,000 electric custmers were affected by this storm. All electric customers had been restored by 12:00 EDT on 9/22/2004.

2004 - Disturbance Reports - Public

Region: FRCC **Control Area ID:** FPL

Date - Time: 9/25/2004 7:00:00 PM EDT **Year:** 2004 **Type:** INT

Utility: Florida Power & Light

Category: Weather **Cause:** Weather - Hurricane Jeanne

Event Description:

On September 25, 2004 at about 1900 EDT, Hurricane Jeanne came ashore approximately at Stuart, Florida, as a category 3 hurricane with winds of 115 mph. The storm has caused both transmission and distribution outages in an area around West Palm Beach, Florida. Damage assessments will not begin until approximately 1300 EDT, as the area is still experiencing hurricane force winds. As a result of this event, about 1,700,000 electric customers are without power.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SOCO

Date - Time: 9/27/2004 8:00:00 AM EDT **Year:** 2004 **Type:** INT

Utility: Southern Company Services, Inc.

Category: Weather **Cause:** Weather - Hurricane Jeanne

Event Description:

On September 27, 2004 at about 0800 EDT, widespread electric customer outages occurred as a result of Hurricanne Jeanne. About 85,455 electric customers were affected.

2004 - Disturbance Reports - Public

Region: WECC-NWPP **Control Area ID:** PACE

Date - Time: 10/17/2004 1:40:00 PM MDT **Year:** 2004 **Type:** UO

Utility: PacifiCorp-East

Category: Sys. Prot. **Cause:** System Protection - Malfunction

Event Description:

On October 17, 2004 at 13:40 MDT, a high voltage transmission line was open-ended because system protection received a transfer trip signal from the opposite end of the line. An area special protection scheme was armed, but did not send a generator trip signal to an area power plant. Because of the open-ended transmission line, another high voltage transmission line and a step down transformer became overloaded. In addition, another high voltage step down transformer was removed from service by system protection. Also, removed from service by system protection was another high voltage transmission line. Area generation and Interchange schedule were curtailed to control the flows on the overloaded elements. There was no generation lost, or electric customer interruptions due to this incident.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** EES

Date - Time: 10/25/2004 11:00:00 AM CDT **Year:** 2004 **Type:** PA

Utility: Entergy

Category: Public Appeal **Cause:** Public Appeal

Event Description:

On October 25, 2004 at 1100 CDT, a utility issued a public appeals to its electric service customers to conserve electric consumption due to the loss of a transformer breaker failure that resulted in the loss of two generating units. In addition to the loss of generation, unseasonably warm temperatures caused the utility to issue this public appeal. The public appeals were broadcast from 1100 to 1700 CDT on October 25, 2004 and again from 0500 to 1000 CDT on October 26, 2004. All affected generating units had been restored by 0916 CDT, on October 26, 2004.

2004 - Disturbance Reports - Public

Region: ECAR **Control Area ID:** MECS

Date - Time: 10/30/2004 10:00:00 AM EDT **Year:** 2004 **Type:** INT

Utility: Michigan Electric Coordinated System

Category: Weather **Cause:** Weather - High Winds

Event Description:

On October 30, 2004 at 1000 EDT, a windstorm with winds gusting to about 55 MPH caused widespread distribution outages. In addition, three high voltage transmission lines were removed from service due to these winds. About 117,842 electric customers were affected by this storm. By 11/1/2004 at 2400 EST, all electric customer electric service had been restored.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** EES

Date - Time: 11/5/2004 2:41:00 AM CST **Year:** 2004 **Type:** UO

Utility: Entergy

Category: EMS Computer Failure **Cause:** EMS Computer Failure

Event Description:

On November 5, 2004 at 0241 CT, a utility experienced an EMS computer system failure with its primary and backup EMS computers. No abnormal events occurred as a result of this failure. By 0414 CST, the EMS computers had been restored.

2004 - Disturbance Reports - Public

Region: MAPP **Control Area ID:** MHEB

Date - Time: 11/7/2004 8:17:00 PM CST **Year:** 2004 **Type:** UO

Utility: MHEB, Transmission Services

Category: SPS Misoperation **Cause:** SPS Misoperation

Event Description:

On November 7, 2004 at 2017 CST, an HVDC flow reduction scheme operated due to a false signal received. The control area's EMS indicated that a high voltage ac transmission line tripped, which initiated the SPS. Upon investigation, no circuit breaker operations were found. There was no generation or electric customer service interrupted due to this incident.

2004 - Disturbance Reports - Public

Region: ECAR **Control Area ID:** CIN

Date - Time: 11/12/2004 EST **Year:** 2004 **Type:** UO

Utility: Cinergy Corporation

Category: EMS Computer Failure **Cause:** EMS Computer Failure

Event Description:

On November 12, 2004 (time unknown), the main EMS computer for a control center failed because of the failed UPS. The control center functions were transferred to its backup facilitity. At 0330 on 11/13/04, the EMS was restarted and control functions transferred after replacing the failed UPS. There was no generation or electric customer service lost as a result of this incident.

2004 - Disturbance Reports - Public

Region: NPCC-Maritimes **Control Area ID:** NSPwr

Date - Time: 11/14/2004 2:00:00 AM AST **Year:** 2004 **Type:** INT

Utility: Nova Scotia Power

Category: Weather **Cause:** Weather - Snow Storm - Severe

Event Description:

On November 14, 2004 at about 0455 EST, a strong northeaster winter blizzard hit Nova Scotia. The storm produced 18 inches of wet snow, with winds up to 55 mph. Several high voltage transmission and distribution lines were damaged by the storm. Nova Scotia became islanded from New Brunswick at about 0455 EST.

The storm continued throughout the day. Additional high voltage transmission lines were damaged. About 100,000 electric customers were interrupted because of this storm.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** EES

Date - Time: 11/20/2004 7:05:00 AM CST **Year:** 2004 **Type:** UO

Utility: Entergy

Category: EMS Computer Failure **Cause:** EMS Computer Failure

Event Description:

On November 20, 2004 at 0705 CST, a utility lost both its primary and secondary EMS computer systems during planned building maintenance. During the time that the EMS system was disabled, a special protection scheme was non-operational. As a result of the building outage, the utility's control center automatically switched to a backup power source and the EMS computers were restored by 0725 CST.

2004 - Disturbance Reports - Public

Region: WECC-NWPP **Control Area ID:** BCTC

Date - Time: 11/23/2004 11:20:00 AM PST **Year:** 2004 **Type:** UO

Utility: British Columbia Transmission Company

Category: Equipment Failure **Cause:** Equipment Failure

Event Description:

On November 23, 2004 at 1120 PST, during a routine fault test, a disconnect blade broke and fell across two phases of energized equipment at a high voltage substation. The resulting fault was slow in clearing, causing several high voltage transmission lines and a single small generating unit to be removed from service. In addition, 370 MW of firm customer load was interrupted. About 88,775 electric service customers were interrupted as a result of this incident. By 1126, all transmission lines had been restored. By 1140, electric service to all customers was restored. At 1148, the single generating unit had been restored.

2004 - Disturbance Reports - Public

Region: SERC **Control Area ID:** SOCO

Date - Time: 11/24/2004 10:00:00 AM EST **Year:** 2004 **Type:** INT

Utility: Southern Company Services, Inc.

Category: Weather **Cause:** Weather - Thunderstorms

Event Description:

Severe thunder storms caused widespread electric customer outages. About 83,450 electric service customers were without power as a result of this storm system.

2004 - Disturbance Reports - Public

Region: WECC-AZNMSNV **Control Area ID:** AZPS

Date - Time: 11/30/2004 2:33:00 PM MST **Year:** 2004 **Type:** UO

Utility: Arizona Public Service Company

Category: Maintenance Error **Cause:** Maintenance Error

Event Description:

On November 30, 2004 at 14:33 MST, multiple generating units were removed from service by normal system protection. The cause of the trouble is not known at this time. There was no electric customer load lost as a result of this incident.