

***NERC WIDE-AREA RESOURCES ADEQUACY
REAL-TIME MONITORING SYSTEM
(ACE-Frequency)***

**Frequency Data Sources, Pre-Calculations,
Normal and Intelligent Alarm Summaries
and Definitions**

Revision: 04.02.08

***DATA COLLECTION AND
PRECALCULATIONS***

INTERCONNECTION FREQUENCY CALCULATION

Collect 6 samples of frequency from data-source every minute and archive their average, minimum and maximum values.

For every minute:

- If Minimum value ≥ 60 ; Use the Max value
- If Maximum value ≤ 60 ; Use the Min value
- If neither of the above; Use the Average value

***INTELLIGENT ALARMS
SUMMARY***

FREQUENCY DATA SOURCES

Revision: 04.02.08

Interconnection	Priority	CA Code	Control Area Name
Eastern	1	ISNE	ISO New England Inc.
	2	PJM	PJM Interconnection
	3	TVA	Tennessee Valley Authority ESO
	4	NYIS	New York Independent System Operator
	5	NSP	Northern States Power Company
Western	1	BCTC	British Columbia Transmission Corporation
	2	PNM	Public Service Company of New Mexico
	3	PACE	PacifiCorp-East
	4	AZPS	Arizona Public Service Company
	5	BPAT	Bonneville Power Administration
	6	LDWP	Los Angeles Department of Water and Power
HQ	1	HQT	Hydro-Quebec, TransEnergie
ERCOT			

INTELLIGENT ALARMS CRITERIA-THRESHOLDS SUMMARY

Eastern and Western Interconnections Revision: 04.02.08

Intelligent Alarm Item	Intelligent Alarm Type	Frequency Threshold (East)	Frequency Threshold (West)	Alarm Time Window	Criteria For Alarming
1	FTL Low	59.950	59.856	>=5 Minutes	Interconnection Frequency Lower than FTL-Low for 5-Minutes or more
2	FTL High	60.050	60.144	>= 5 Minutes	Interconnection Frequency Greater than FTL-High for 5-Minutes or more
3	FAL Low	59.908	59.722	1 Minute	Compare with Threshold
4	FAL High	60.092	60.278	1 Minute	Compare with Threshold
5	FRL Low	59.82	59.50	1 Minute	Compare with Threshold
6	FRL High	60.18	60.5	1 Minute	Compare with Threshold
7	Prolong (DCS)	Schedule or Pre-Event Frequency	Schedule or Pre-Event Frequency	> 20-Minutes	If after a Short Term Alarm, Frequency Does Not Cross Schedule or Pre-Event Frequency In less Than 20 Minutes (DCS)
8	Long Term Low	-0.030	-0.030	> 60 Minutes	Average Frequency Deviation Greater than 30mHz More Than 60 Minutes
9	Long Term High	0.030	0.030	> 60 Minutes	Average Frequency Deviation Less than -30mHz More Than 60 Min
10	Short Term High	0.035	0.035	1 Minute	Interconnection Frequency 1-minute change Greater than 0.035Hz
11	Short Term Low	-0.035	-0.035	1 Minute	Interconnection Frequency 1-minute change Less than -0.035Hz

***SHORT TERM
FREQUENCY DEVIATION ALARM
DESCRIPTION***

SHORT TERM FREQUENCY DEVIATION ALARM

Subject Line

SHORT TERM FREQUENCY DEVIATION EAST

Interconnection Name Inserted

Message

SHORT-TERM: -EAST 8/23/2005 11:34:00 PM (EDT)
- Frequency Absolute value of two most recent 1-Minutes:
ABS(59.967-60.008)=0.041Hz>=0.035Hz.

Time of Alarm Occurrence

Current Frequency

Previous Frequency

Threshold

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***PROLONGED
FREQUENCY DEVIATION
ALARM DESCRIPTION***

PROLONGED FREQUENCY DEVIATION ALARM

Subject Line

PROLONGED FREQUENCY DEVIATION EAST

Interconnection Name Inserted

Message

PROLONGED: -EAST 8/23/2005 11:34:00 PM (EDT)
- More than 20 Minutes under Short-Term Deviation.

Time of Alarm Occurrence

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**LONG TERM
FREQUENCY DEVIATION
ALARM DESCRIPTION**

LONG TERM FREQUENCY DEVIATION ALARM

Subject Line

LONG TERM FREQUENCY DEVIATION EAST

Interconnection Name Inserted

Message

LONG-TERM: -EAST 7/10/2005 6:29:00 AM(EDT) - Rolling Frequency Hourly Average for last 60 minutes was +0.031Hz >= 0.03Hz.

Time of Alarm Occurrence

Threshold

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ACE DATA QUALITY ALARM DESCRIPTION

ACE DATA QUALITY ALARM

Subject Line

ACE QUALITY DATA PROBLEM EAST

Interconnection Name Inserted

Message

ACE-QUALITY: -EAST 5/9/2005 1:10:00 AM(EST) "Yadkin, Inc." - ACE
has not been transferred for more than 30 minutes

*Control
Area Name*

*Time of Alarm
Occurrence*

Threshold

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**FREQUENCY DATA QUALITY
ALARM DESCRIPTION**

FREQUENCY DATA QUALITY ALARM

Subject Line

FREQUENCY QUALITY DATA PROBLEM EAST

Interconnection Name Inserted

Message

FREQUENCY-QUALITY: - EAST 5/9/2005 1:10:00 AM(EST) "New York Independent System Operator" - Frequency source data has not been transferred for more than 15 Minutes

Time of Alarm Occurrence

Control Area Name

Threshold

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**SYSTEM STATUS (SERVERS)
ALARM DESCRIPTION**

SYSTEM STATUS ALARM (SERVERS)

Subject Line

NERC DATA SERVERS DOWN

Message

NERC DATA SERVERS DOWN: 8/15/2005 9:46:00 PM(PST) - NERC Data servers have been unavailable for the last 37 minutes. NERC Data servers have been unavailable 100% of the time today.

Time of Alarm Occurrence

Minutes Unavailable

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**TIME ERROR CORRECTION (TEC)
ALARM DESCRIPTION**

START TIME ERROR CORRECTION MESSAGE

Interconnection Name Inserted

Subject Line

TEC EAST STARTED, 59.98

*Scheduled
Frequency*

Message

*Time of Alarm
Occurrence*

FAST TEC ACTIVE, START=8/23/2005 11:57:00 AM(EDT), SCHED
FREQ=59.98

*Scheduled
Frequency*

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END TIME ERROR CORRECTION MESSAGE

Interconnection Name Inserted

Subject Line

TEC EAST ENDED

Message

Time of Alarm Occurrence

FAST TEC, START=8/23/2005 11:57:00 AM(EDT), END=8/23/2005 4:57:00 PM(EDT), SCHED FREQ=59.98

Scheduled Frequency

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***ACE EXECEEDING AND VIOLATING BAAL
ALARM DESCRIPTION***

FTL LOW ALARM 5 MINUTE

Subject Line

Low Frequency Trigger Limit Violation 59.944 Hz

Actual Frequency Value

Message

Interconnection
Name

Time of Alarm
Occurrence

Threshold

FTL LOW: -EAST 8/23/2005 11:34:00 PM (EDT)

Frequency has reached/or exceeded FTL of 59.95 Hz.
for more than 5 minutes.

Load-Generation resources under inadequate balance.

Proposed Actions, if necessary, for Reliability Coordinators:

1. RCs shall:

- Monitor the balancing authorities (BAs) within its RC area to identify if any BA(s) has an Area Control Error (ACE) greater than it's Balancing Authority ACE Limit (BAAL).
- Direct the corrective actions necessary to return the BA's ACE to an acceptable limit.
- Log event details and corrective actions on the Reliability Coordinator Information System (RCIS), in the Frequency section.

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FTL HIGH ALARM 5 MINUTE

Subject Line

High Frequency Trigger Limit Violation **60.055** Hz

Actual Frequency Value

Message

*Interconnection
Name*

*Time of Alarm
Occurrence*

FTL HIGH: **-EAST** 8/23/2005 11:34:00 PM (EDT)

Frequency has reached/or exceeded FTL of **60.05** Hz.
for more than 5 minutes.

Threshold

Load-Generation resources under inadequate balance.

Proposed Actions, if necessary, for Reliability Coordinators:

1. RCs shall:

- Monitor the balancing authorities (BAs) within its RC area to identify if any BA(s) has an Area Control Error (ACE) greater than it's Balancing Authority ACE Limit (BAAL).
- Direct the corrective actions necessary to return the BA's ACE to an acceptable limit.
- Log event details and corrective actions on the Reliability Coordinator Information System (RCIS), in the Frequency section.

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FTL LOW ALARM 10 MINUTE

Subject Line

Low Frequency Trigger Limit Violation 59.944 Hz

Actual Frequency Value

Message

*Interconnection
Name*

*Time of Alarm
Occurrence*

Threshold

FTL LOW: -EAST 8/23/2005 11:34:00 PM (EDT)
Frequency has reached/or exceeded FTL of 59.95 Hz.
for more than 10 minutes.

Load-Generation resources under inadequate balance.

Proposed Actions, if necessary, for Reliability Coordinators:

1. RCs shall:

- Monitor the balancing authorities (BAs) within its RC area to identify if any BA(s) has an Area Control Error (ACE) greater than it's Balancing Authority ACE Limit (BAAL).
- Direct the corrective actions necessary to return the BA's ACE to an acceptable limit.
- Log event details and corrective actions on the Reliability Coordinator Information System (RCIS), in the Frequency section.

2. RCs shall:

- Direct corrective actions for all BAs within their RC area that have an ACE beyond its BAAL to correct its ACE.
- Log event details and corrective actions on the RCIS, in the Frequency section. If the cause of the event is not known, then survey all BAs within the RC area for information and data.

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FTL HIGH ALARM 10 MINUTE

Subject Line

High Frequency Trigger Limit Violation 60.055 Hz

Actual Frequency Value

Message

Interconnection
Name

Time of Alarm
Occurrence

Threshold

FTL HIGH: -EAST 8/23/2005 11:34:00 PM (EDT)
Frequency has reached/or exceeded FTL of 60.05 Hz.
for more than 10 minutes.

Load-Generation resources under inadequate balance.

Proposed Actions, if necessary, for Reliability Coordinators:

1. RCs shall:

- Monitor the balancing authorities (BAs) within its RC area to identify if any BA(s) has an Area Control Error (ACE) greater than it's Balancing Authority ACE Limit (BAAL).
- Direct the corrective actions necessary to return the BA's ACE to an acceptable limit.
- Log event details and corrective actions on the Reliability Coordinator Information System (RCIS), in the Frequency section.

2. RCs shall:

- Direct corrective actions for all BAs within their RC area that have an ACE beyond its BAAL to correct its ACE.
- Log event details and corrective actions on the RCIS, in the Frequency section. If the cause of the event is not known, then survey all BAs within the RC area for information and data.

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FAL LOW ALARM

Subject Line

Low Frequency Abnormal Limit Violation 59.90 Hz

Actual Frequency Value

Message

*Interconnection
Name*

*Time of Alarm
Occurrence*

Threshold

FAL LOW: -EAST 8/23/2005 11:34:00 PM (EDT)
Frequency has reached/or exceeded FAL of 59.91 Hz.
Current Frequency Value: 59.90 Hz.

Risk of 2nd Contingency is greater than acceptable.

Proposed Immediate Actions for Reliability Coordinators:

1. RCs shall:

- Monitor the balancing authorities (BAs) within its RC area to identify if any BA(s) has an Area Control Error (ACE) greater than it's Balancing Authority ACE Limit (BAAL).
- Direct the corrective actions necessary to return the BA's ACE to an acceptable limit.
- Log event details and corrective actions on the Reliability Coordinator Information System (RCIS), in the Frequency section.

2. RCs shall:

- Direct corrective actions for all BAs that have an ACE that is hurting frequency.
- Log event details and corrective actions on the RCIS, in the Frequency section. If the cause of the event is not known, then survey all BAs within the RC area for information and data.

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FAL HIGH ALARM

Subject Line

High Frequency Abnormal Limit Violation 60.21 Hz

Actual Frequency Value

Message

Interconnection
Name

Time of Alarm
Occurrence

Threshold

FAL HIGH: -EAST 8/23/2005 11:34:00 PM (EDT)
Frequency has reached/or exceeded FAL of 60.20 Hz.
Current Frequency Value: 60.21 Hz.

Risk of 2nd Contingency is greater than acceptable.

Proposed Immediate Actions for Reliability Coordinators:

1. RCs shall:

- Monitor the balancing authorities (BAs) within its RC area to identify if any BA(s) has an Area Control Error (ACE) greater than it's Balancing Authority ACE Limit (BAAL).
- Direct the corrective actions necessary to return the BA's ACE to an acceptable limit.
- Log event details and corrective actions on the Reliability Coordinator Information System (RCIS), in the Frequency section.

2. RCs shall:

- Direct corrective actions for all BAs that have an ACE that is hurting frequency.
- Log event details and corrective actions on the RCIS, in the Frequency section. If the cause of the event is not known, then survey all BAs within the RC area for information and data.

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FRL LOW ALARM

Subject Line

Low Frequency Reliability Limit Violation 59.81 Hz

Actual Frequency Value

Message

Interconnection
Name

Time of Alarm
Occurrence

Threshold

FRL LOW: -EAST 8/23/2005 11:34:00 PM (EDT)
Frequency has reached/or exceeded FRL of 59.82 Hz.
Current Frequency Value: 60.51 Hz.

Load has or will be dropped.

Proposed Immediate Actions for Reliability Coordinators:

1. RCs shall:

- Monitor the balancing authorities (BAs) within its RC area to identify if any BA(s) has an Area Control Error (ACE) greater than it's Balancing Authority ACE Limit (BAAL).
- Direct the corrective actions necessary to return the BA's ACE to an acceptable limit.
- Log event details and corrective actions on the Reliability Coordinator Information System (RCIS), in the Frequency section.

2. RC shall:

- Evaluate and determine if the RC area and all BA areas within the RC area are still interconnected.
- Direct emergency action.
- Log event details and corrective actions on the RCIS, in the Frequency section. If the cause of the event is not known, then survey all BAs within the RC area for information and data.

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FRL HIGH ALARM

Subject Line

High Frequency Reliability Limit Violation 60.51 Hz

Actual Frequency Value

Message

Interconnection
Name

Time of Alarm
Occurrence

Threshold

FRL HIGH: -EAST 8/23/2005 11:34:00 PM (EDT)
Frequency has reached/or exceeded FRL of 60.50 Hz.
Current Frequency Value: 60.51 Hz.

Generation has or will be dropped.

Proposed Immediate Actions for Reliability Coordinators:

1. RCs shall:

- Monitor the balancing authorities (BAs) within its RC area to identify if any BA(s) has an Area Control Error (ACE) greater than it's Balancing Authority ACE Limit (BAAL).
- Direct the corrective actions necessary to return the BA's ACE to an acceptable limit.
- Log event details and corrective actions on the Reliability Coordinator Information System (RCIS), in the Frequency section.

2. RC shall:

- Evaluate and determine if the RC area and all BA areas within the RC area are still interconnected.
- Direct emergency action.
- Log event details and corrective actions on the RCIS, in the Frequency section. If the cause of the event is not known, then survey all BAs within the RC area for information and data.

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