

*Consortium for
Electric
Reliability
Technology
Solutions*

Automated Reliability Reports Project

Automated Reliability Reports (ARR)

HELP

Version: 10.05.09

October 5, 2009



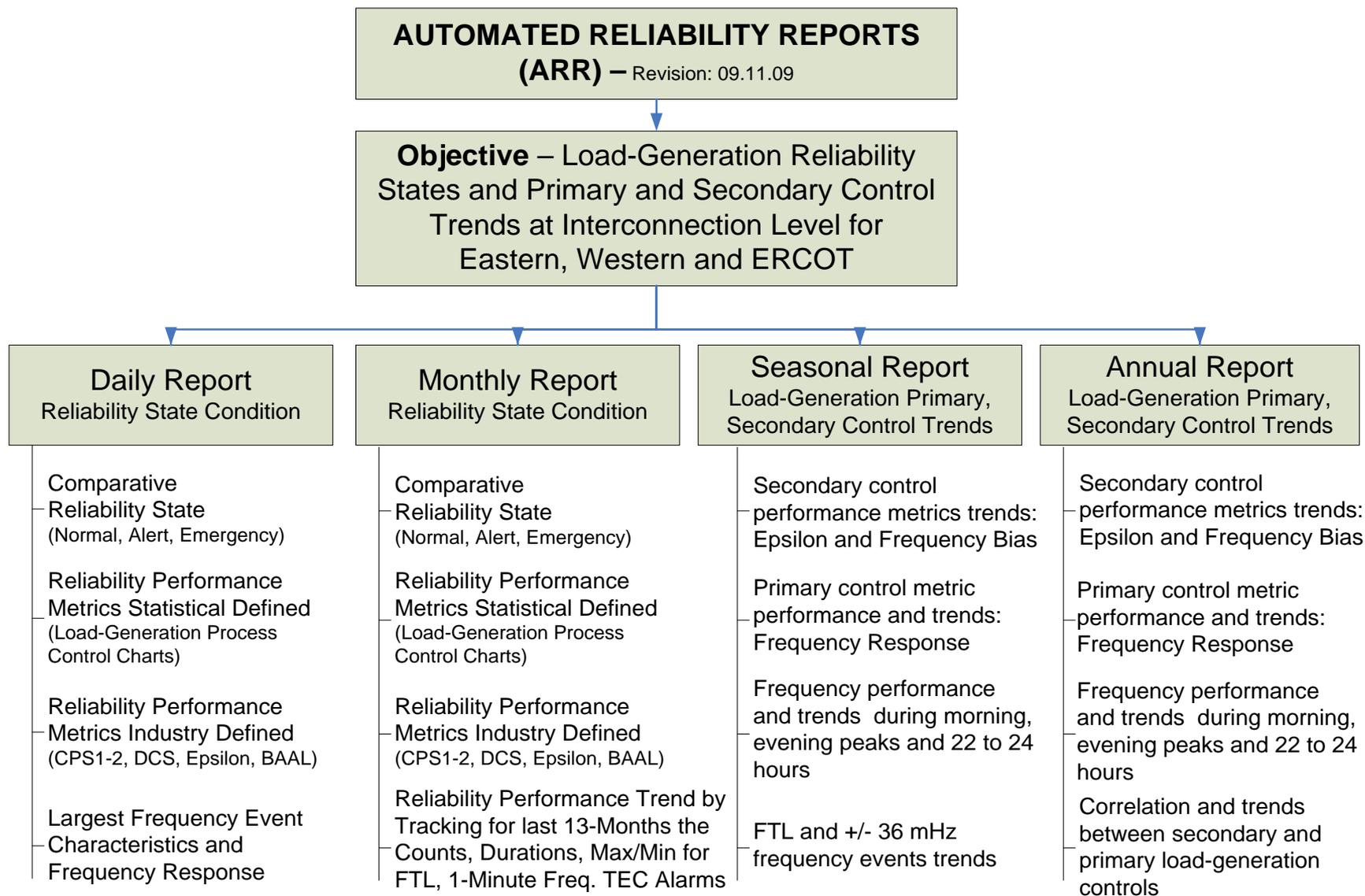
NERC
NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

CERTS
CONSORTIUM FOR ELECTRIC RELIABILITY TECHNOLOGY SOLUTIONS

 **Electric Power Group**

*ARR Daily, Monthly, Seasonal and
Yearly Reports Objectives Data Sources
Availability and Navigation*

ARR Training - Reports Objectives and Utilization



ARR Training Historical Data Availability

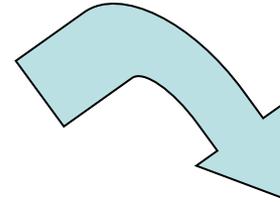
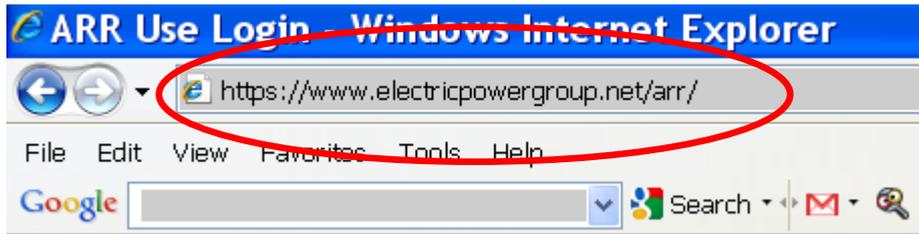
Interconnection	NERC Resource Adequacy 1-Minute Data (NERC Data Base)	NERC Intelligent Alarms 1-Minute Data (NERC Data Base)	NERC FMA Phasor Data 1-Second Data (FMA Data Base)
Eastern	2002 to Present	2006 to Present	July 2008 to Present
Western	2002 to Present	2006 to Present	2008, Future 2009
ERCOT	Sep 2008 to Present	Sep 2008 to Present	2008, Future 2009

Field Test – 1-Second Phasor Data Availability

FMA Data Type	Data Source Name	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	2008	2009	
TVA Phasor 1-second	VOLUNTEER-FQ-EI						1%	90%	98%	98%	100%	100%	98%	96%	98%	99%	99%	100%	100%	98%	100%	99%	99%	84%	98%	96%	98%	99%	93%	98%	90%	92%	98%	94%	95%	
	CALLAWAY-FQ-EI						1%	97%	98%	98%	99%	99%	97%	94%	98%	99%	98%	99%	99%	97%	99%	98%	99%	99%	84%	97%	95%	97%	97%	92%	98%	80%	65%	17%	93%	80%
ERCOT 2-second	FARRAGUT-FQ-EI						0%	72%	41%	49%	61%	63%	79%	88%	91%	63%	69%	95%	92%	46%	0%	69%	95%	82%	85%	94%	94%	91%	89%	95%	76%	81%			75%	89%
	ERCOT2Sec													100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	22%							100%	61%	
NERC SCADA 10-second	ISNE-EI							69%	100%	99%	92%	92%	99%	98%	91%	98%	100%	100%	100%	99%	98%	90%	81%	100%	99%	97%	98%	80%	97%	98%	96%	99%	97%	96%	95%	
	PJM-EI							69%	99%	99%	92%	92%	99%	98%	92%	99%	100%	100%	100%	99%	99%	90%	81%	100%	99%	97%	98%	80%	98%	97%	96%	99%	97%	96%	95%	
	TVA-EI							60%	100%	99%	92%	90%	99%	98%	92%	99%	98%	100%	100%	99%	99%	90%	80%	100%	99%	97%	98%	80%	97%	99%	97%	99%	97%	96%	98%	
	BCTC-WECC							68%	99%	98%	92%	92%	99%	95%	92%	99%	100%	99%	98%	99%	83%	76%	100%	99%	97%	98%								95%	98%	
	PNM-WECC							68%	99%	99%	92%	92%	100%	96%	92%	100%	99%	100%	98%	98%	99%	83%	76%	100%	99%	97%	98%	80%	97%	99%	97%	99%	97%	95%	98%	
TEC 10-second	HQT							68%	99%	99%	92%	92%	100%	96%	91%	99%	100%	100%	100%	99%	77%	90%	80%	100%	99%	97%	98%	80%	98%	99%	97%	99%	97%	94%	96%	
	ERCOT(Start 10/08)																					19%	62%	82%	77%	90%	92%	91%	91%	91%	90%	89%	89%	60%	90%	
FNET Phasor 1-second (In Progress)	EI	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98%	92%	99%	100%	100%	100%	100%	99%	90%	81%	99%	99%	97%	98%	81%	98%	97%	96%	99%	94%	96%	99%	
	ERCOT													100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	22%							100%	61%	
FNET Phasor 1-second (In Progress)	WI						29%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%	83%	75%	99%	99%	97%	98%	81%	98%	97%	99%	96%	99%	97%	96%	96%
	EiVirtual	92%	88%	97%	73%	96%	92%	86%	83%	88%	80%	92%	87%	99%	99%	98%	97%	100%	100%	100%	100%	100%	100%	100%	99%	96%								99%	49%	
	FSU - Tallahassee, FL	86%	88%	80%	34%	96%	92%	83%	69%	78%	0%	0%	0%	0%	0%	0%	0%	3%	97%	0%	40%	0%	0%	0%	0%									12%		
	IMPA-Carmel, IN	95%	90%	99%	83%	95%	88%	0%	22%	87%	85%	94%	88%	99%	95%	43%	21%	99%	30%	71%	77%	100%	100%	98%	96%			96%			28%	23%		77%	49%	
	UMR - Rolla, MO	49%	34%	48%	62%	96%	42%	81%	1%	0%	0%	0%	83%	98%	95%	94%	97%	99%	88%	34%	21%	0%	1%	0%	23%							25%	20%		54%	23%
	VT-Blacksburg, VA	95%	91%	99%	77%	96%	86%	88%	84%	87%	84%	85%	87%	95%	3%	94%	97%	100%	98%	97%	98%	99%	100%	99%	69%			94%				2%		88%	48%	
	ERCOTVirtual	91%	81%	96%	80%	91%	92%	91%	73%	87%	65%	65%	10%	67%	83%	98%	100%	100%	100%	100%	100%	99%	99%	99%	75%			98%				22%		93%	60%	
	Houston	94%	84%	99%	83%	91%	92%	91%	77%	87%	70%	65%	10%	0%	14%	97%	99%	98%	100%	99%	99%	39%	1%	98%	44%			94%				22%		66%	58%	
	UTSA - San Antonio, TX	87%	83%	87%	79%	86%	91%	32%	73%	20%	0%	0%	0%	0%	3%	93%	93%	90%	80%	44%	26%	0%	0%	0%	0%									36%		
	WECCVirtual	91%	88%	95%	78%	96%	91%	86%	83%	88%	80%	94%	87%	99%	99%	98%	99%	100%	100%	100%	100%	100%	100%	100%	99%	96%			100%			25%	23%		99%	49%
	Alberta - Edmonton, AB	69%	37%	89%	66%	75%	57%	70%	55%	2%	0%	0%	26%	22%	18%	0%	0%	0%	0%	0%	4%	8%	0%	0%	0%					41%		24%	22%		4%	29%
	EPRI-Palo Alto, CA	94%	90%	99%	21%	57%	50%	86%	76%	85%	81%	93%	85%	96%	94%	96%	98%	99%	98%	99%	99%	99%	99%	97%	89%			95%			25%	22%		97%	49%	
	LA-Pasadena, CA	0%	0%	12%	84%	95%	91%	86%	77%	88%	85%	94%	88%	96%	97%	97%	99%	99%	98%	100%	100%	87%	99%	97%	96%			22%			3%	22%		97%	16%	
NewWSU - Pullman, WA	47%	42%	35%	26%	12%	0%	0%	0%	0%	71%	0%	0%	0%	0%	0%	0%	0%	0%	3%	100%	45%	0%	0%	0%									12%			

ARR Web-Site Navigation

ARR Web Site Call and Login



The screenshot shows the "FERC Automated Reliability Reports (ARR), Release 1.0" website. The main content area features a central graphic with a map of the United States and the text "AUTOMATED RELIABILITY REPORTS (ARR)". Surrounding this central graphic are four report categories: "DAILY REPORT", "YEARLY REPORT", "MONTHLY REPORT", and "SEASONAL REPORT", each with a small thumbnail image. On the right side of the page, there is a "ARR User Login" section, which is circled in red. This section contains a "User Name:" field, a "Password:" field, and a "Login" button. Below the login section, there is a message: "If you encounter any difficulties while using this application, please contact Support at Electric Power Group." followed by contact information for Electric Power Group, including their location in Pasadena, California, telephone number (626)685-2015, fax number (626)685-2039, and email address contact@electricpowergroup.com. The footer of the page includes logos for NERC (North American Electric Reliability Corporation) and CERTS, and the Electric Power Group logo with the text "Grid 3P. U.S. Patent 7,233,483" and "Electric Power Group, All Rights Reserved".

24-Hours, Daily, Monthly, Seasonal, Yearly Reports Selection and View

FERC Automated Reliability Reports (ARR), Release 1.0 Help

DAILY REPORT

YEARLY REPORT

AUTOMATED RELIABILITY REPORTS (ARR)

MONTHLY REPORT

SEASONAL REPORT

Create and View Last 24-Hour Report
Use the control below to select the final hour of the 24-hour period desired.

For: 09/30/2009

Up To Hour:

Reports Available, Selection and View
Archived reports available for viewing or download.

Daily Monthly Season Yearly

Reports are Available From: **04/01/2009**

To: **09/21/2009**

Select the Desired Date Range:

Start Date Time: 4/1/2009 12:00:00 AM

End Date Time: 9/21/2009 12:00:00 AM

Select the Desired Report to view in PDF Format:

- 4/1/2009 12:00:00 AM
- 4/2/2009 12:00:00 AM
- 4/3/2009 12:00:00 AM
- 4/4/2009 12:00:00 AM

Electric Power Group
Grid 3P. U.S. Patent 7.233.483
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Daily Report
Objective, Contents and
Reliability States Concept

Daily Report Objective and Contents

OBJECTIVE - Provide a 24-hour summary of historical load-generation resource adequacy and control performance for the three NERC interconnections known as the Eastern, Western and ERCOT.

For each interconnection the report presents:

Section 2.1 - The number of hours within a 24-hour period that each interconnection was operating in the three reliability states (Normal, Alert, and Emergency) equivalent to the three states defined and in trial by NERC Reliability Coordinators

Section 2.2 - Load-generation resource adequacy represented by the performance of CPS1-2, BAAL and DCS reliability metrics compared to recommended limits and considering each interconnection as a single Balancing Authority

Section 2.3 - The interconnections reliability performance during alert state compared to ACE-frequency standards

Section 3 - 24-Hour circular and statistical process control (SPC) plots showing the load-generation adequacy represented by key reliability performance metrics all aligned by hour, and the frequency deviation RMS (Epsilon)

Section 4 – Characteristics for the largest frequency event for each interconnection and an estimate of Frequency Response for that event

Reliability States Defined by Coordinators

Condition Level >>>>	Normal	Alert Level 1	Alert Level 2	Alert Level 3
Threat Level>>>>	Low	Elevated	High	Severe
Condition/Threat Color >>>>	Green	Yellow	Orange	Red
Generating/capacity	EEA 0 No Energy Deficiencies	EEA 1 all available generation resources in use	EEA 2 Load management procedures in effect	EEA 3 Firm load interruption imminent or in progress
Transmission	TEA 0 Respecting all IROLs	TEA 1 All available generation resources committed to respecting IROLs OR concern with ability to respect IROL	TEA 2 Load Mgmt procedures in effect to respect IROLs	TEA 3 Firm Load Curtailements in effect to respect IROLs
Security	SEA 0 No cyber threat identified; No known threats on control center or grid assets (lines, substations, generators)	SEA 1 Cyber threat identified or is imminent, OR verified physical threat against control center or grid assets	SEA 2 Cyber event is affecting control center EMS capability, OR physical attack at <i>single</i> site (control center or grid assets- lines, substations, generators)	SEA 3 Cyber event has shut down control center EMS capability, OR physical attack at <i>multiple</i> sites (control center or grid assets- lines, substations, generators)

Daily Report Objective and Framework

	Normal		Contingency	Emergency
Condition Level >>>>	Normal	Alert Level 1	Alert Level 2	Alert Level 3
Threat Level >>>>	Low	Elevated	High	Severe
Condition/Threat Color >>>>	Green	Yellow	Orange	Red
Generating/capacity	EEA 0 No Energy Deficiencies	EEA 1 all available generation resources in use	EEA 2 Load management procedures in effect	EEA 3 Firm load interruption imminent or in progress

Scenario 1 - July 3rd

ARR Training – Scenario July 3rd – I-Alarms

FTL HIGH 5 EAST: 60.058 Hz, 07/03 07:02 (EDT)

NERC/CERTS FREQUENCY MONITOR [DoNotReply@electricmonitor.com]

Follow up
Extra line breaks in this message were removed.

To: ace_frequency_alarm_recipients@electricpowergroup.com

FTL HIGH: -EAST 7/3/2009 7:02:00 AM (EDT) Frequency has reached/or exceeded High Frequency Trigger Limit (FTL) of 60.05 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.

-----DISCLAIMER-----

This notice reflects the most current information available from Control Areas. These notice results depend on the quality and completeness of the data supplied and, accordingly, the accuracy of this notice cannot be assured.
This notice is provided solely for informational purposes.

BACK FTL EAST: 5 Min, 07/03 07:03 (EDT)

NERC/CERTS FREQUENCY MONITOR [DoNotReply@electricmonitor.com]

Follow up
Extra line breaks in this message were removed.

To: ace_frequency_alarm_recipients@electricpowergroup.com

Attachments: [SummaryDataSheet_070309_0703AM_EDT.doc](#) (75 KB)

BACK FROM FTL HIGH ALARM: -EAST 7/3/2009 7:03:00 AM (EDT) Frequency is back from a FTL High 5 min alarm started at -EAST 7/3/2009 7:02:00 AM (EDT) The frequency was above the FTL high threshold of 60.05 Hz for a total of 5 Minutes and reached a maximum of 60.058 Hz during that period.

Load-Generation resources had inadequate balance.

Reliability Coordinators were supposed to:

- . 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.

-----DISCLAIMER-----

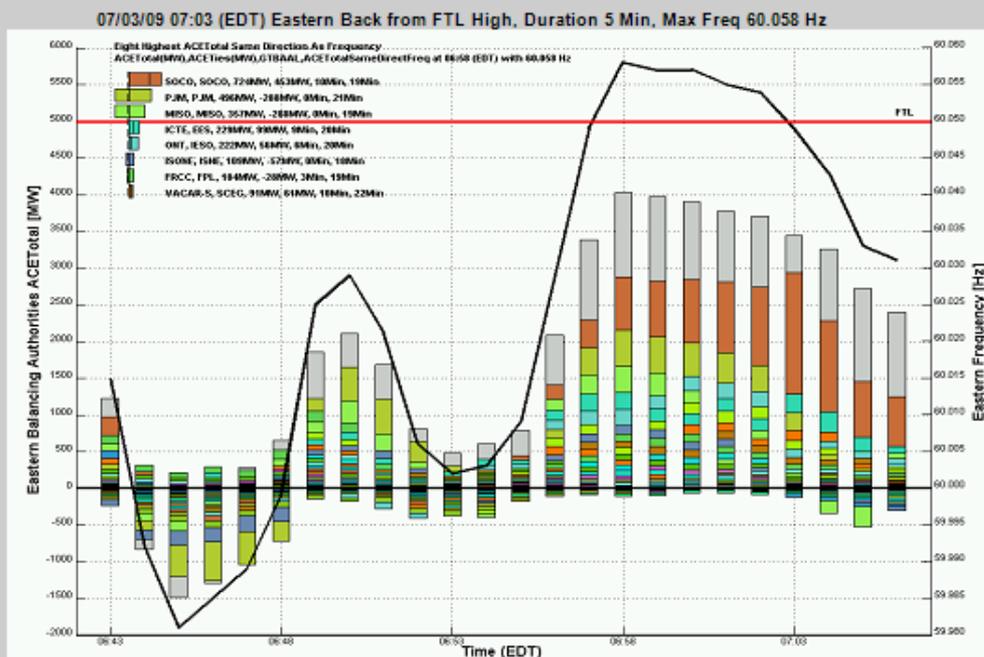
This notice reflects the most current information available from Control Areas. These notice results depend on the quality and completeness of the data supplied and, accordingly, the accuracy of this notice cannot be assured.
This notice is provided solely for informational purposes.

ARR Training – July 3rd 7:03AM – I-Alarms Analysis

1 - ALARM DESCRIPTION:

Back from BRD: 07/03/09 07:03 (EDT) Eastern Back from FTL High, Duration 5 Min, Max Freq 60.058 Hz

2 - GRAPH FOR INTERCONNECTION FREQUENCY vs. BAs ACETotal (Measured):



BAs ACE RESPONSE vs. INTERCONNECTION FREQUENCY

Interconnection frequency was above 60 Hz for about 19 Min with a total average of 60.024 Hz. The following BAs ACETotal were in the same direction (hurting) frequency was: 3 BAs for more than 20 Min: PJM, SCEG, SME. 20 BAs for more than 15 Min: AECI, CPLE, DUK, EES, FPC, FPL, IESO, ISNE, LAGN, LES, LGEE, MISO, MPW, NYIS, OVEC, RC, SOCO, SPC, TAL, WAUE.

PRELIMINARY ALARM ROOT-CAUSE ASSESSMENT - Frequency and BAs ACE data quality acceptable. Interconnection unexplained ACE -376 MW on average for the last 24 Min. The 8 BAs contributing the most to the alarm condition in decreasing order were: SOCO, PJM, MISO, EES, IESO, ISNE, FPL, and SCEG.

ARR Training – July 3rd FMA Events

Frequency Response Events Editor

Interconnection Selection

Eastern Western

ERCOT Quebec

Frequency/ACE Range

Frequency Range Hz To Hz

Net ACE Total Range MW To MW

Source Name

ALL

VOLUNTEER-FQ

E|Virtual

CALLAWAY-FQ

Time Frame Selection

Start Date/Time

End Date/Time

Frequency Points

T -

to

T +

2009/07/03 02:26:42 VOLUNTEER-FQ

2009/07/03 02:26:41 CALLAWAY-FQ

2009/07/03 02:10:24 CALLAWAY-FQ

2009/07/03 02:10:23 VOLUNTEER-FQ

FREQUENCY RESPONSE CALCULATION

PMU Location

Actual Net Interchange Immediately Before Disturbance (Point A) * MW
(Interconnection NetACE Tie Component)

Actual Net Interchange Immediately After Disturbance (Point B) * MW
(Interconnection NetACE Tie Component)

Change in Net Interchange MW

Generation (-) lost Causing the Disturbance * MW

Interconnection Response MW

Change in Interconnection Frequency from Point A to Point B Hz

Frequency Response **MW / 0.1 Hz**

Event Status * Not Valid

POINTS DP, A, B and C FREQUENCIES

Interconnection Frequency Bias MW / 0.1 Hz

Frequency at Decline Point (DP) Hz

Frequency at Point B Hz

Frequency at Point C Hz

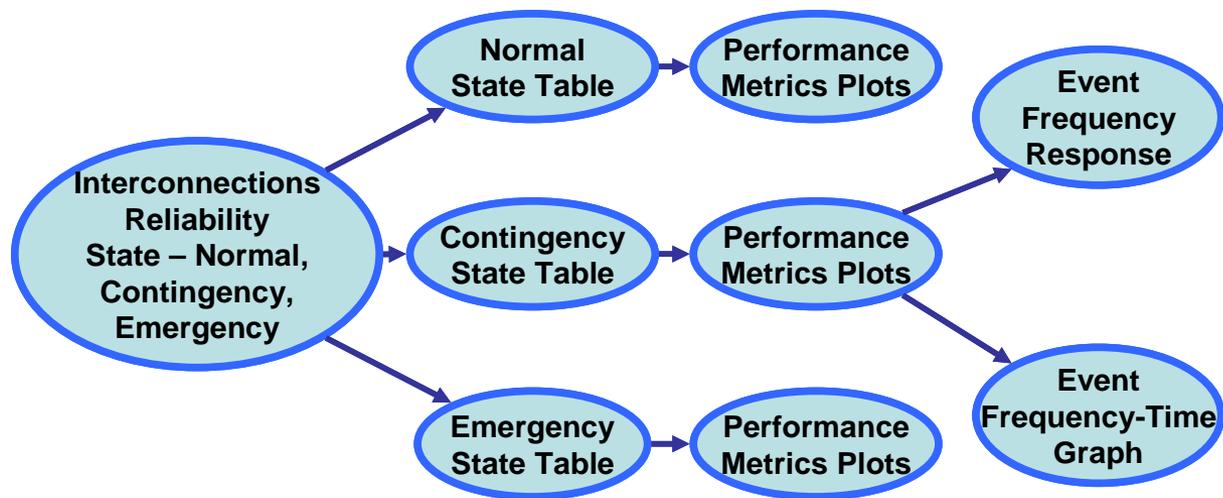
Point A Frequency (Avg. of 5-seconds prior to decline) Hz

NOTE

- * - Represents Editable Field
- Lines DP,C & B are Movable.

ARR Training - Daily Report Overview

The objective of this report is to provide a summary of historical load-generation resource adequacy and control performance for NERC three interconnections, and data, and the Frequency trace plot and Frequency Response for the largest frequency event



ARR Training – July 3rd States Condition Summary

Interconnections Hours of Operation in Each Reliability State				
Interconnection	NORMAL	ALERT	EMERGENCY ²	Observation
Eastern	23	1	0	Highest Freq 60.058 Hz
Western	24	0	0	-
ERCOT	24	0	0	-

Interconnections 24- Hours Performance Metrics - Actual vs Recommended									
Intercon- nection	CPS2 - Hours Daily		CPS1 - % Daily		BAAL Exceeds Daily		DCS Minutes to Return to Normal		Observations
	Rec Max	Actual	Rec Min	Actual	Rec Max	Actual	Std. Max	Actual	
Eastern	2.4	19	100	145	0	0	15	-	CPS2 Exceeded
Western	2.4	7	100	185	0	0	15	-	CPS2 Exceeded
ERCOT	2.4	20	100	137	0	2	15	-	CPS2, BAAL Exceeded

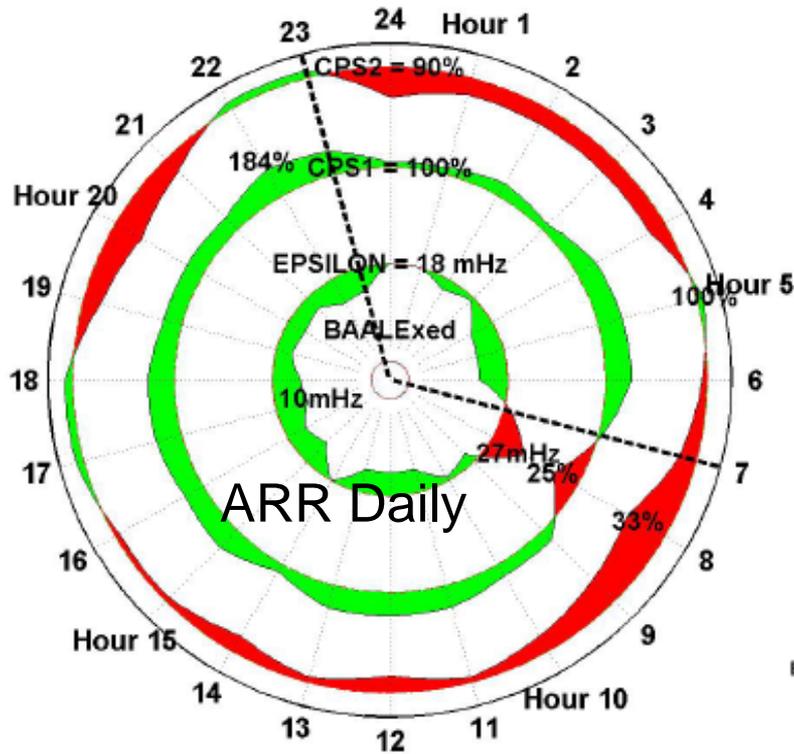
2.3 Interconnections Alert State Performance

The Eastern longest alert state event occurred at 07:03 AM when the frequency exceeded the Frequency Trigger Limit threshold for approximately 5 minutes and reach a maximum of 60.058Hz.

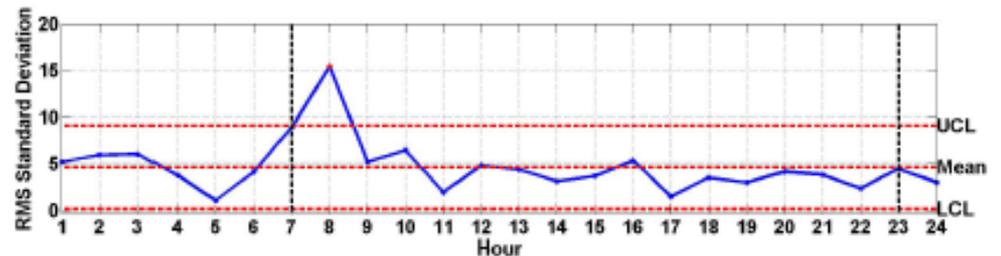
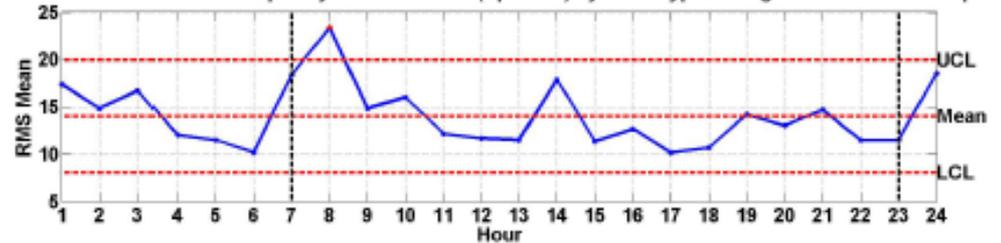
Interconnections Alert State Performance Metrics							
Intercon- nection	Frequency Trigger Limit Minutes		Frequency Alert Limit Minutes		Frequency Relay Limit Daily		Observations
	Std. Max	Actual	Rec Min	Actual	Rec Max	Actual	
Eastern	30	5	1	0	1	0	No Violations
Western	-	-	-	-	-	-	No Violations
ERCOT	-	-	-	-	-	-	No Violations

ARR Training – July 3rd

Load-Generation Control Hourly Performance

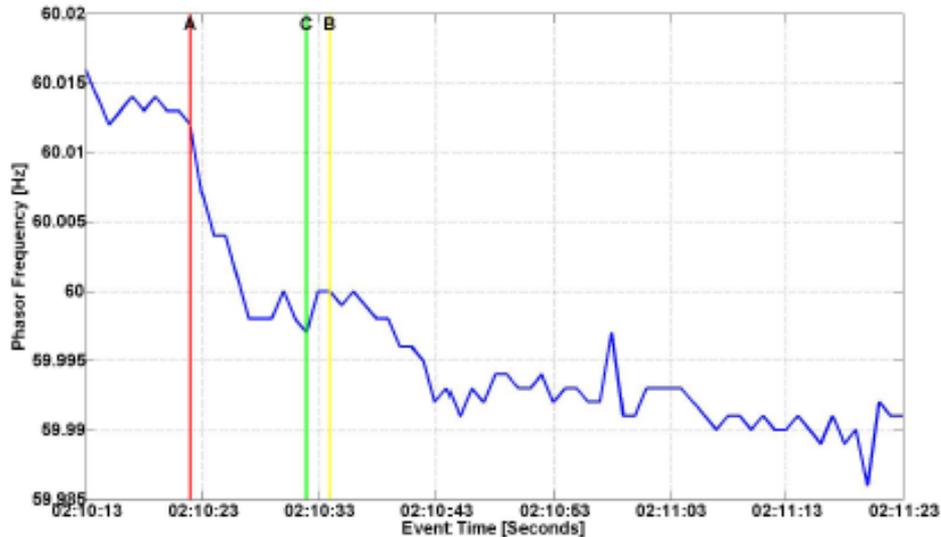


Eastern Xbar-S Chart for Frequency Deviation RMS (Epsilon1) by Hour-Types Using 10-Minute Data Sample

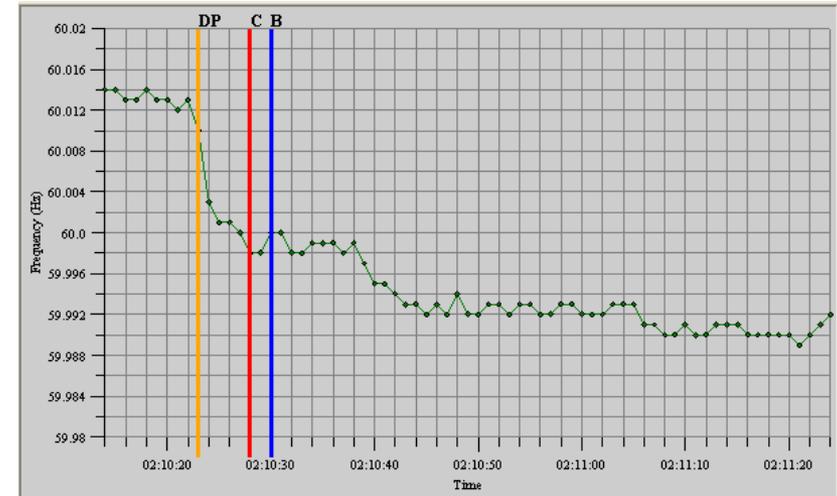


ARR Training – July 3rd Largest Frequency Event

ARR Daily Report



FMA Event



Interconnection frequency response for largest Event	Calc.
Event Summary: Eastern, Date/Time: 7/3/2009 2:10:00 AM	-
Frequency at Point A (Avg. of 5-seconds prior to decline) = 60.012 [Hz]	-
Frequency at: Point B = 60 [Hz], at Point C = 59.997 [Hz]	-
Actual Net Interchange Immediately Before Disturbance (Point A) [MW]	2
Actual Net Interchange Immediately After Disturbance (Point B) [MW]	745
Change in Net Interchange [MW]	747
Generation Lost Causing the Disturbance [MW]	872
Interconnection Response [MW]	-125
FREQUENCY RESPONSE CALCULATION [MW / 0.1Hz]	967

ARR Training – July 3rd Analysis Conclusion

Load-Generation primary and secondary control normal day with a 5-minute FTL alarm very possible due for an incorrect schedule error, and not significant frequency excursions

Monthly Report
Objective, Contents and Outline

Monthly Report Objective and Contents

OBJECTIVE - Provide a 30-day summary of historical load-generation resource adequacy and control performance for the three NERC interconnections known as the Eastern, Western and ERCOT.

For each interconnection the report presents:

Section 2.1 - High-level summary including the number of days within the month that each interconnection was operating in the three reliability states (Normal, Alert, and Emergency) equivalent to the three alerts defined and in trial by NERC Reliability Coordinators

Section 2.2 - High-level summary including load-generation resource adequacy and control performance represented by CPS1-2, BAAL and DCS reliability metrics compared to recommended limits and considering each interconnection as only one Balancing Authority

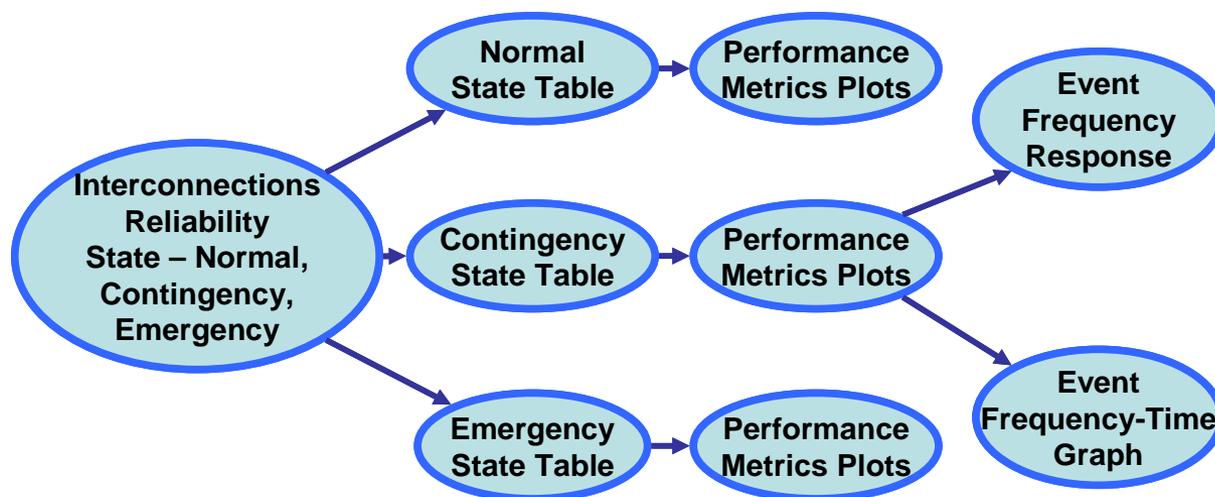
Sections 2.3 - High-level summary including the interconnections reliability performance during alert state

Section 3 - Reliability performance while operating in normal state represented by the monthly circular and statistical process control (SPC) charts showing in the circular plot load-generation adequacy represented by key reliability performance metrics all aligned by day, and in the SPC charts frequency deviation RMS (Epsilon). Interconnections Line-plot and boxplots showing Epsilon performance for each August day and median and variability for each of the last 13 months

Section 4 - Reliability monthly performance trend by tracking for the last 13 months the counts, duration, max/min, and other statistics for the following broadcasted Intelligent Alarms: FTL, FAL, FRL, 1-Minute Delta Frequency, Long Term, and Time Error Corrections.

ARR Training - Monthly Report Overview

The objective of this report is to provide a summary of historical load-generation resource adequacy and control performance for NERC three interconnections, and data, and the Frequency trace plot and Frequency Response for the largest frequency event



Scenario 2 – July, 2009

ARR Training – July 2009 States Condition Summary

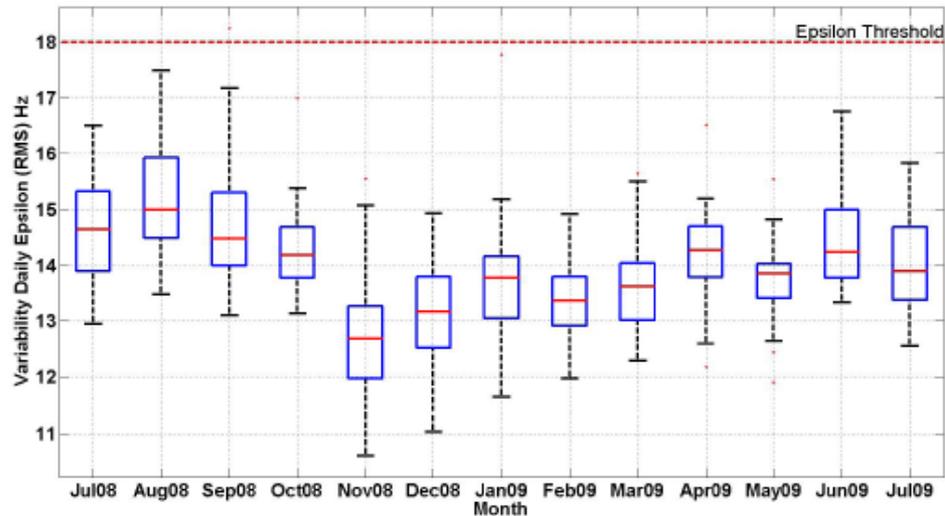
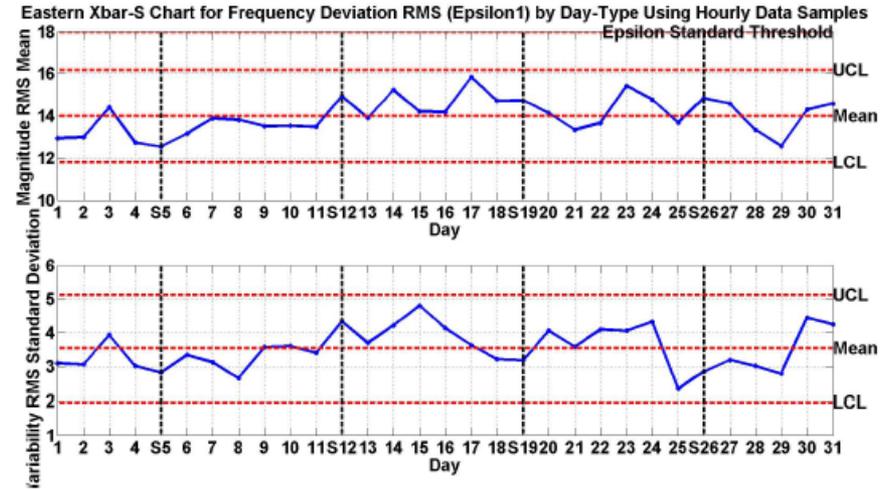
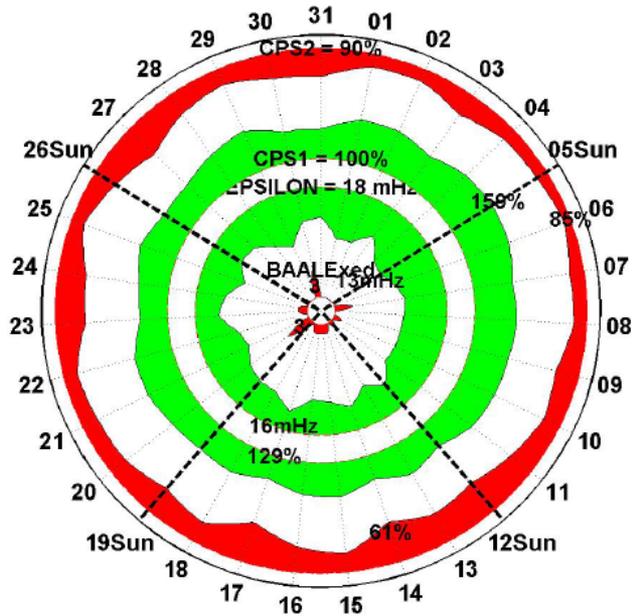
Interconnections Hours of Operation in Each Reliability State				
Interconnection	NORMAL	ALERT	EMERGENCY ²	Observation
Eastern	30	1	0	Alert State on July 3
Western	31	0	0	31 Days in Normal State
ERCOT	29	2	0	2 Days in Alert State

Interconnections Monthly Performance Metrics - Actual vs Recommended								
Interconnection	CPS2 - % Monthly		CPS1 - % Monthly		BAAL Exceeds in Month	DCS Minutes to Return to Normal		Observations
	Rec Min	Actual Lowest	Rec Min	Actual Lowest	Actual	Std. Max	Actual	
Eastern	90	61	100	129	18	15	-	CPS2Below Threshold
Western	90	82	100	181	0	15	-	CPS2Below Threshold
ERCOT	90	57	100	129	35	15	-	CPS2Below Threshold

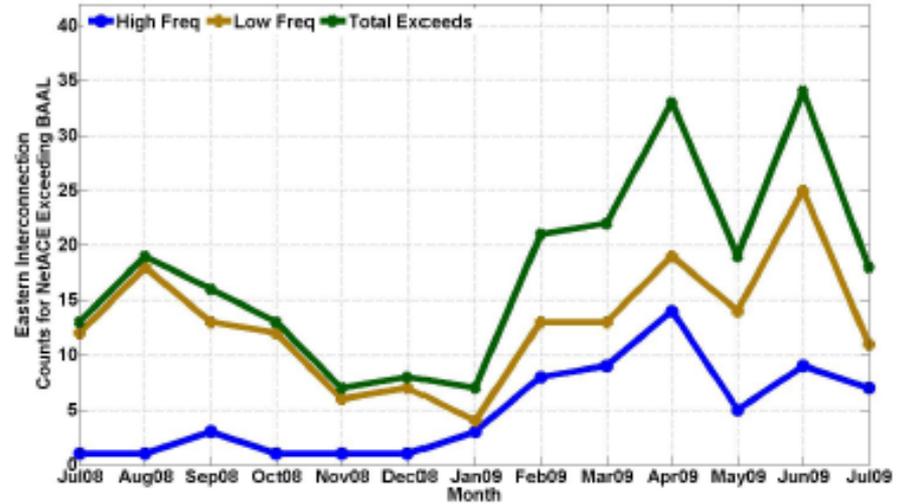
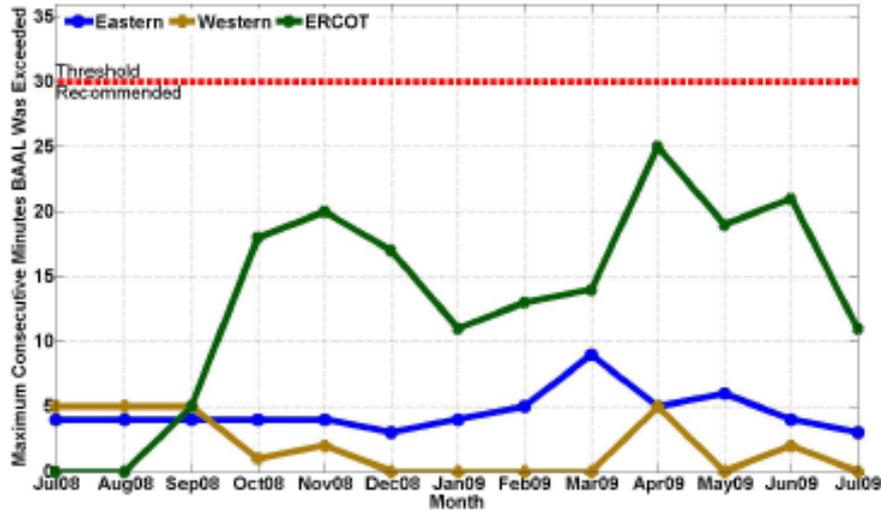
Interconnections Alert State Performance Metrics							
Interconnection	Frequency Trigger Limit Minutes		Frequency Alert Limit Minutes		Frequency Relay Limit Minutes		Observations
	Rec Min	Actual Highest	Rec Min	Actual Highest	Std. Max	Actual	
Eastern	30	5	1	0	1	0	1 Day in FTL Alert
Western	30	0	1	0	1	0	Normal
ERCOT	30	11	1	0	1	0	2 Days in FTL Alerts

ARR Training – July, 2009

Load-Generation Control Daily/Monthly Performance

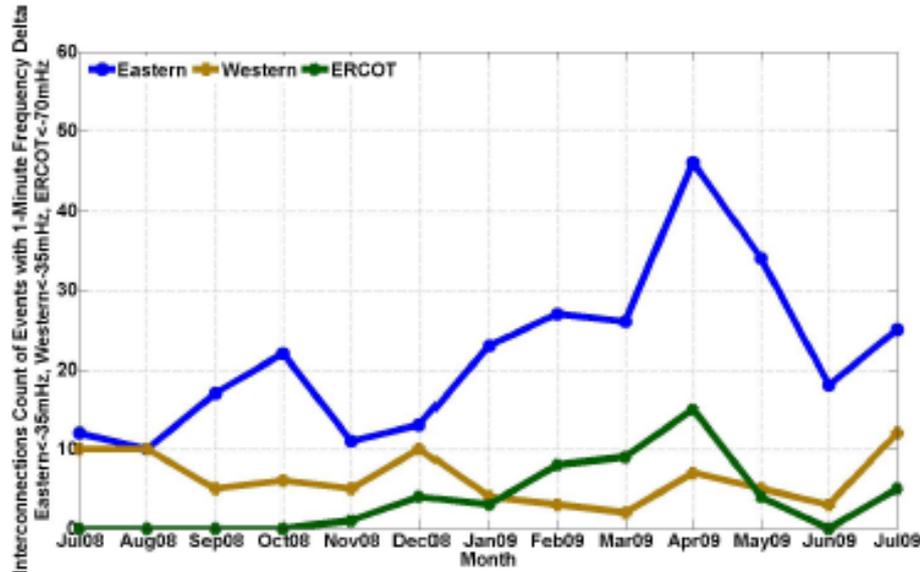


ARR Training – July, 2009 FTL, FAL, FRL Trends



Interconnections Load-Generation Resources Adequacy and Control FTL, FAL, FRL Alarm Summary							
Interconnection and Alarm Type	Frequency Trigger Limit (FTL) 5-Minute Intelligent Alarms			Frequency Alarm Limit (FAL) 1-Minute Intellig. Alarms		Frequency Relay Limit (FRL) 1-Minute Intellig. Alarms	
	Date/Time	Lowest Highest Freq.	Duration Min.	Date/Time	Lowest Highest Freq.	Date/Time	Lowest Highest Freq.
Eastern High	07/03/09 07:03	60.058	5	No Alarms	-	No Alarms	-
Western	No Alarms	-	-	No Alarms	-	No Alarms	-
ERCOT Low	07/09/09 23:11	59.882	11	No Alarms	-	No Alarms	-
ERCOT Low	07/30/09 00:14	59.892	8	No Alarms	-	No Alarms	-

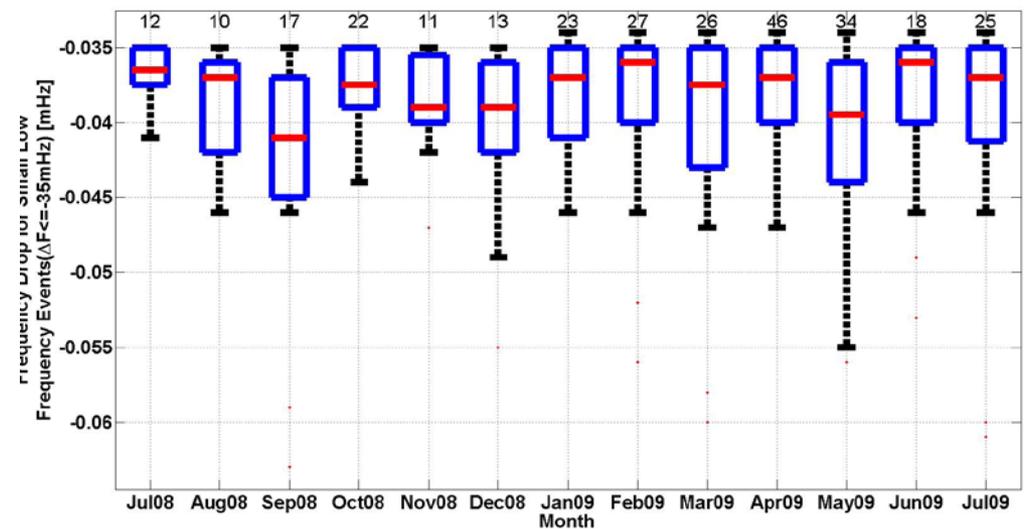
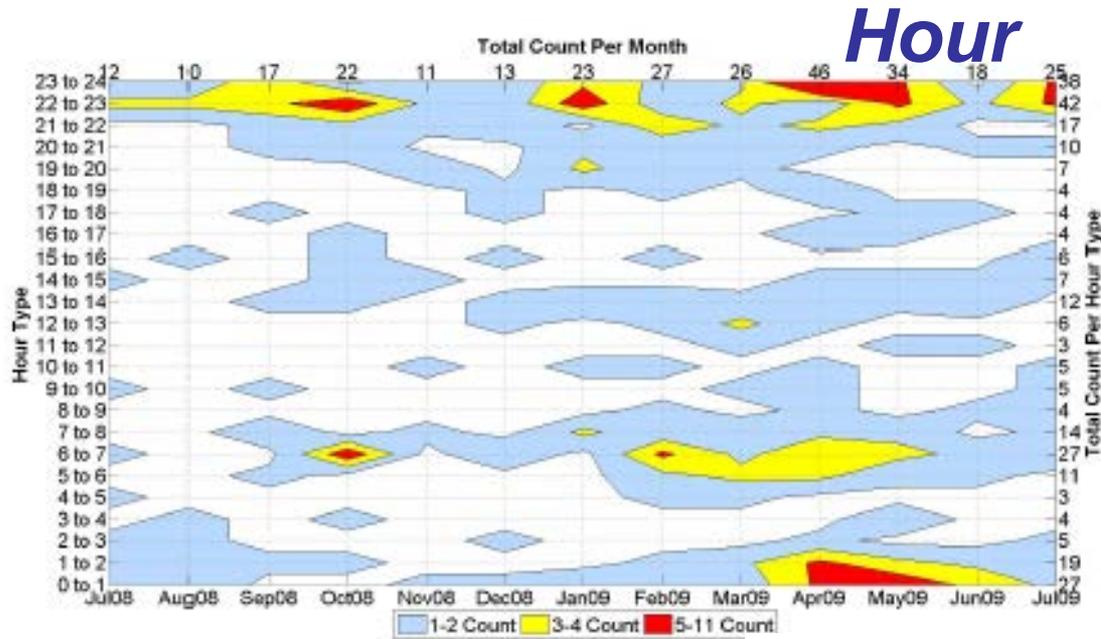
ARR Training – July, 2009 Frequency Events Trends



Interconnections Resource Adequacy and Control Long Term and Short Term Alarms Summary						
Interconnection and Alarm Type	Short Term Low Frequency Intelligent Alarms		Short Term High Frequency Intelligent Alarms		Long Term 60-Minutes Frequency Intelligent Alarms	
	Count	Lowest/Highest Freq.	Count	Lowest/Highest Freq.	Count	Absolute Average Freq. Deviation
Eastern JUL 09	25	59.942	16	60.044	0	-
Eastern JUN 09	18	59.94	12	60.033	0	-
Eastern MAY 09	34	59.945	22	60.044	0	-
Eastern APR 09	46	59.936	43	60.044	0	-
Eastern MAR 09	26	59.929	20	60.034	0	-
Eastern FEB 09	27	59.937	23	60.044	0	-
Eastern JAN 09	23	59.958	18	60.046	0	-
Western JUL 09	12	59.944	4	60.035	0	-

ARR Training – July 2009 Eastern -36 mHz Events

Trend for Counts, Lowest Frequency Per Month-



ARR Training – July Time Error Corrections

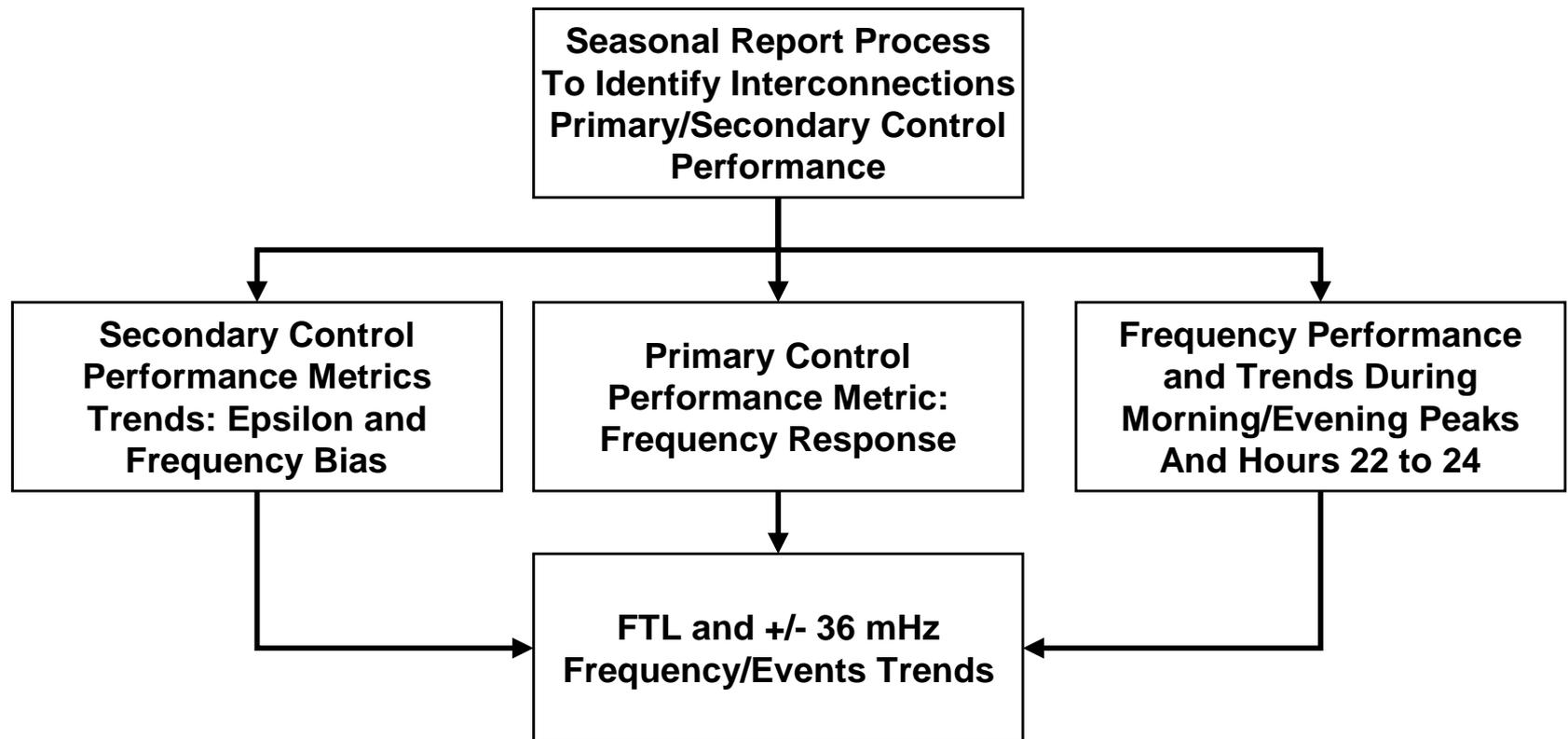
Interconnections Time Error Correction Monthly Alarms Summary						
Interconnection	Start Date	Start Time	End Date	End Time	Scheduled Frequency	Duration Hours
EASTERN	29-JUL	07/29/09 15:00	30-JUL	07/30/09 02:00	59.98	11
EASTERN	26-JUL	07/26/09 18:59	27-JUL	07/27/09 05:00	59.98	11
EASTERN	24-JUL	07/24/09 11:59	24-JUL	07/24/09 20:00	59.98	9
EASTERN	22-JUL	07/22/09 13:59	22-JUL	07/22/09 23:59	59.98	10
EASTERN	17-JUL	07/17/09 11:59	17-JUL	07/17/09 20:00	59.98	9
EASTERN	16-JUL	07/16/09 12:00	16-JUL	07/16/09 20:00	59.98	8
EASTERN	14-JUL	07/14/09 21:00	15-JUL	07/15/09 04:59	59.98	7
EASTERN	13-JUL	07/13/09 20:59	14-JUL	07/14/09 05:05	59.98	9
EASTERN	11-JUL	07/11/09 12:00	11-JUL	07/11/09 19:05	59.98	7

ARR Training – Analysis, Conclusion for January 09

To be Defined

Seasonal Report Objectives and Outline

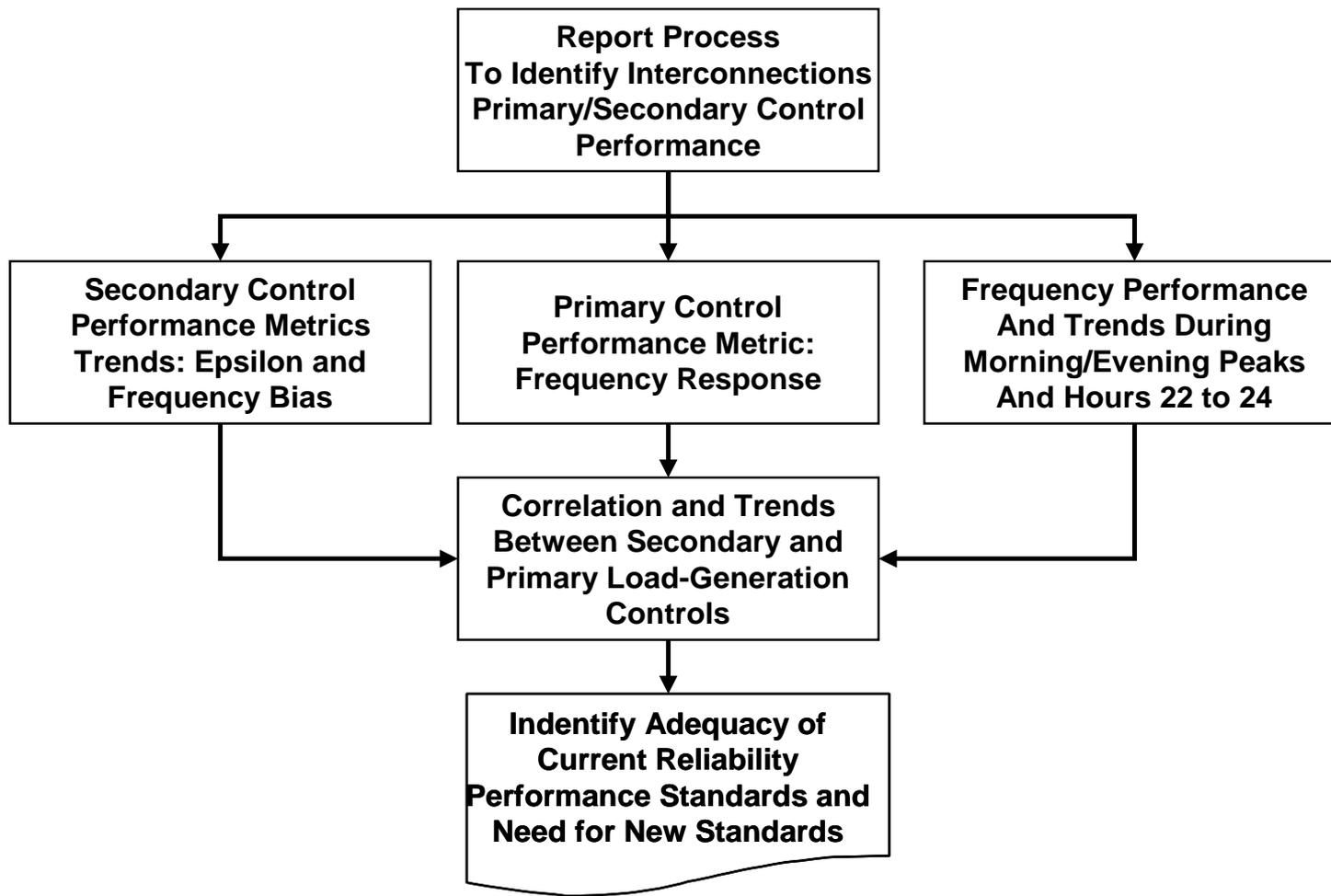
ARR Training – Seasonal Report



Scenario 3
(To be Defined)

Yearly Report Objectives and Outline

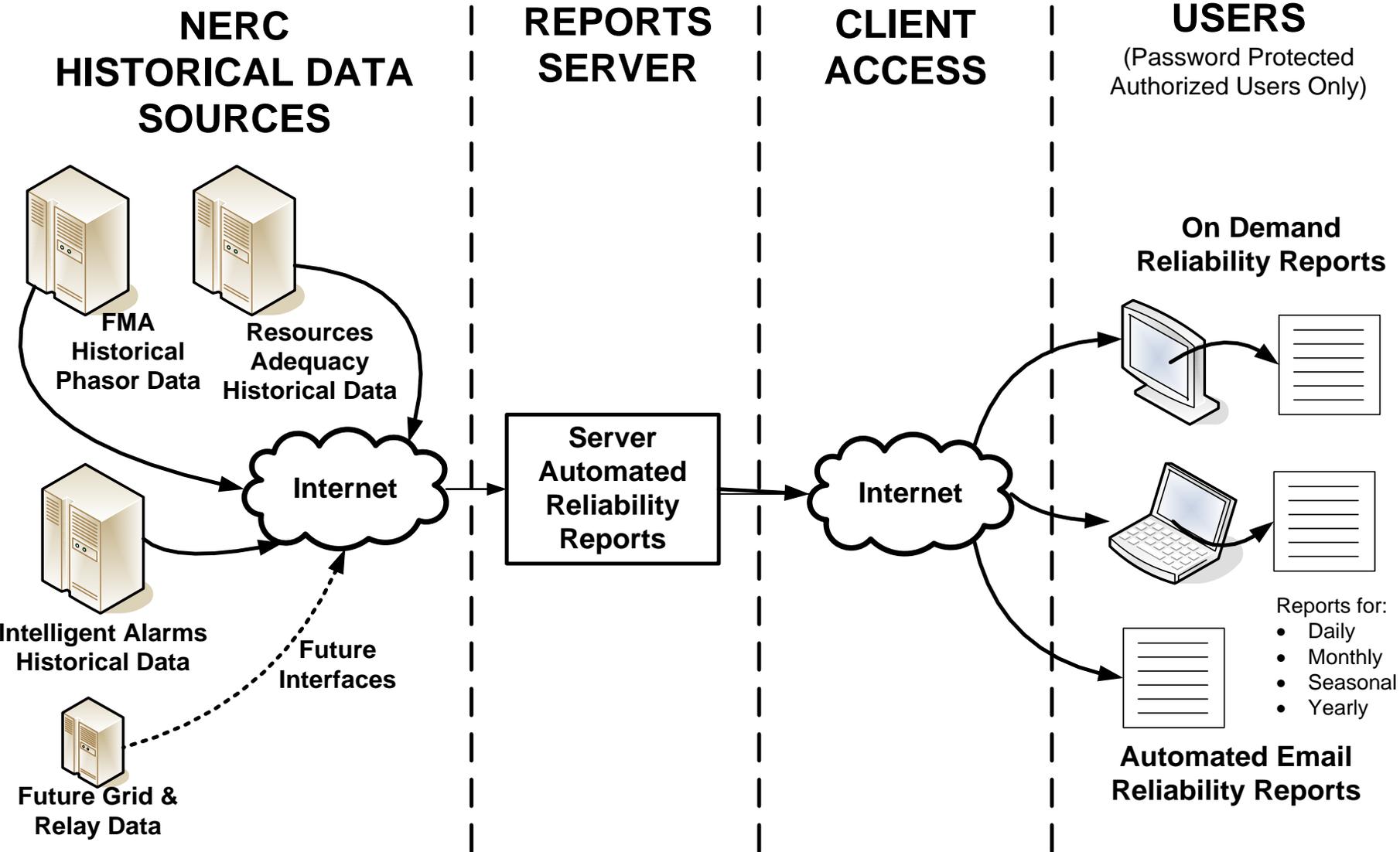
ARR Training – Yearly Report



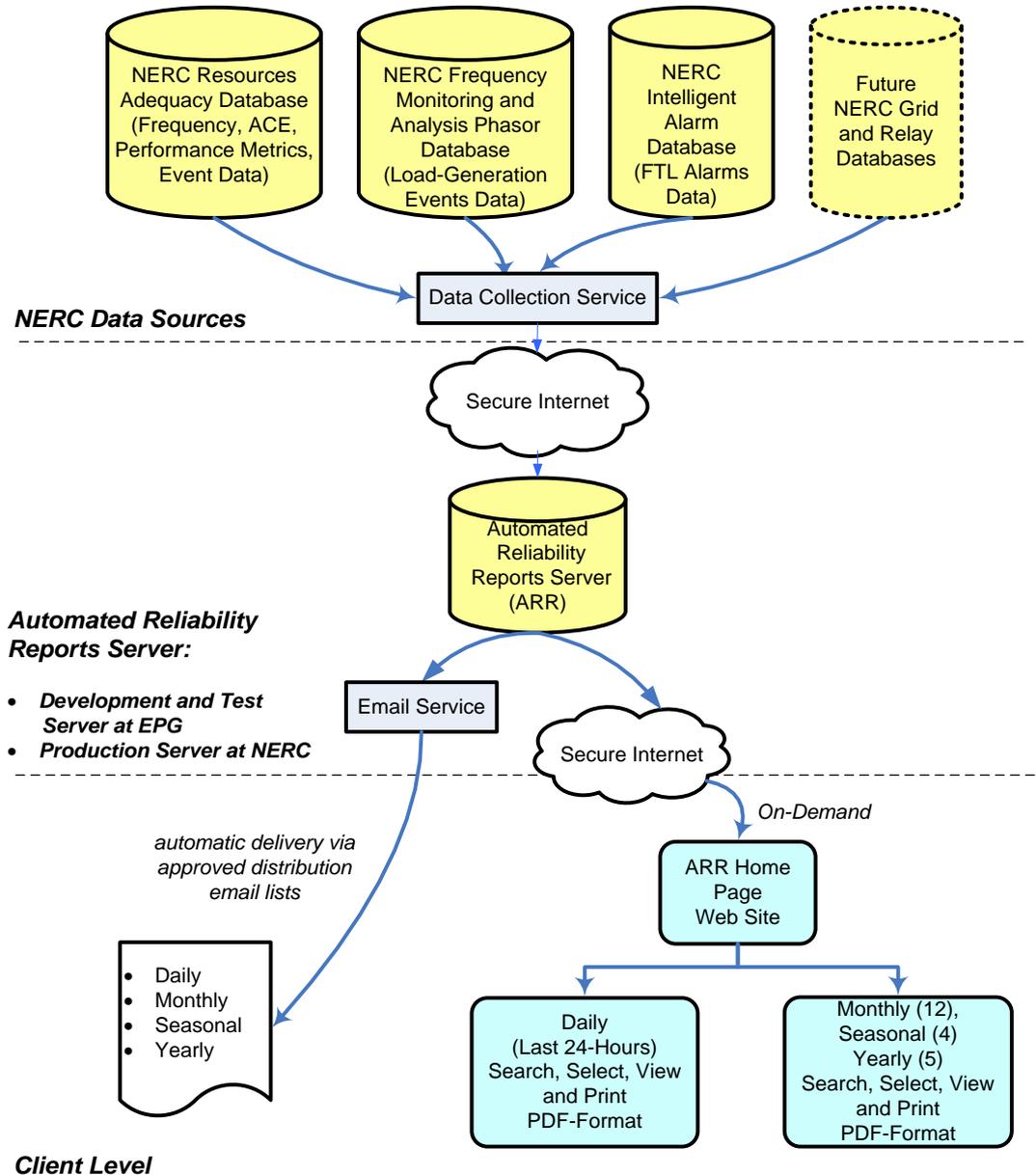
Scenario 4
(To be Defined)

*Hardware, Data Communications
Database Architectures Verification
(Use Slides)*

Field Test - Data Sources and Data Communications

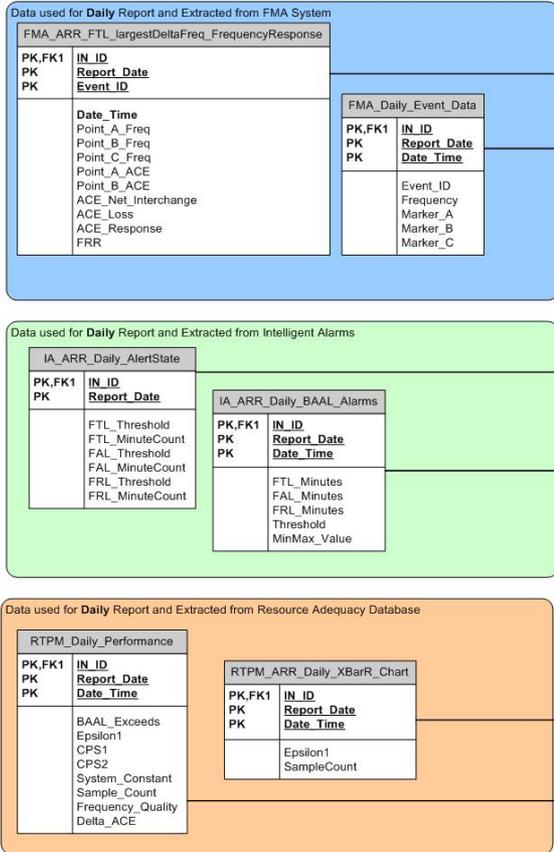


FERC AUTOMATED RELIABILITY REPORTS (ARR)



Field Test – Database Schema

ARR Database Schema – Daily Report Components



ARR Database Schema – Monthly Report Components

