Instructions

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 7

Step 7

Step 8

Enter data in all green cells on the "Data Entry" worksheet. Cell G1 with the BA name. Cells R11 through

For identified events in column C of the "Data Entry" worksheet, collect data and complete one FRS Form
Detailed Instructions for utilizing the "Adjustments" are located on the "Adjustments" worksheet below the

PasteSpecial/Values data from FRS Form 2 "Form 1 Summary Data" worksheet into "BA Form 2 Event Da

Enter FERC Form 714 data from the most recent completed Form 714 in the worksheet "Form 714 Data" i
Your current year's Frequency Response Obligation will be calculated in cell R20 of the "Data Entry" work

a) If a Fixed Bias was selected, cell R27 will calculate the minimum Bias (least negative) allowed based o
b) If a Fixed Bias was selected, cell R28 will calculate the minimum (in absolute terms) Bias allowed base
c) If a Fixed Bias was selected, cell R29 will calculate the maximum Bias (in absolute terms) allowed base
d) If R29 was more negative than the value in R27, you may choose a Bias setting that is between R29 an
appear in cell R33.

a) If a Variable Bias was selected, cell R27 will indicate "not applicable" where there is no maximum or mi
b) If a Variable Bias was selected, enter "Variable" in cell R31.
c) If a Variable Bias was selected, cell R30 will calculate the minimum Bias (in absolute terms) allowed ba
average Variable Bias setting when frequency is lower than 59.964 Hz or higher than 60.036 Hz and enter
D13.
d) If the "average annual Variable Bias Setting" in cell D14 on the "Variable Bias Supplemental Info" works
cell D14 on the "Variable Bias Supplementa Info" worksheet will turn red. The average minimum Bias Set
from those year's Form 1s for this evaluation.
e) Depending on when the Implementation date is each year for the annual Bias Setting, the ERO may be
completed by the ERO before each year's FRS Form 1 is published.
f) The comparison to the FBS minimum will be from two previous year's analysis prior to the current year a
example, if it is Feb 1, 2013 and you are calculating your 2012 FBS time weigted average, the minimum F
Peak Demand/Peak Gen reported in June of 2011 for 2010 data. Enter each field in green using the appr

Two FRMs are calculated. One for the BA Bias Setting and one for meeting R1 of the standard.
The FRM for the BA Bias Setting will use all selected events and all SEFRD values will use the delta frequ
The FRM for the BA compliance to R1 will limit the delta frequency to no greater than those listed in Table
ERCOT +/-0.700 Hz and HQ +/-1.500 Hz.)

Save this workbook using the following file name format:NYISO_yyyy_FRS_Form_1.9.xlsx. (where NYISO

Send completed Form 1 and each Form 2 to NERC.

eet for your exact file name.

Report 714 Data (in MW) Part II Schedule 3	
Column (b) Month	Column (j) Peak Demand
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

Average	#DIV/0!
Maximum	0

Peak Demand: (Your BA from Form 714, column j of Part II - Schedule 3)

Event Number	Balancing Authority Date/Time (t-0) (Central Prevailing)	MyBA DelFreq	JOU Dynamic Schedules		Non conforming Load	
			Value A Adjustment	Value B Adjustment	Value A Adjustment	Value B Adjustment
1			0.0	0.0	0.0	0.0
2			0.0	0.0	0.0	0.0
3			0.0	0.0	0.0	0.0
4			0.0	0.0	0.0	0.0
5			0.0	0.0	0.0	0.0
6			0.0	0.0	0.0	0.0
7			0.0	0.0	0.0	0.0
8			0.0	0.0	0.0	0.0
9			0.0	0.0	0.0	0.0
10			0.0	0.0	0.0	0.0
11			0.0	0.0	0.0	0.0
12			0.0	0.0	0.0	0.0
13			0.0	0.0	0.0	0.0
14			0.0	0.0	0.0	0.0
15			0.0	0.0	0.0	0.0
16			0.0	0.0	0.0	0.0
17			0.0	0.0	0.0	0.0
18			0.0	0.0	0.0	0.0
19			0.0	0.0	0.0	0.0
20			0.0	0.0	0.0	0.0
21			0.0	0.0	0.0	0.0
22			0.0	0.0	0.0	0.0
23			0.0	0.0	0.0	0.0
24			0.0	0.0	0.0	0.0
25			0.0	0.0	0.0	0.0
26			0.0	0.0	0.0	0.0
27			0.0	0.0	0.0	0.0
28			0.0	0.0	0.0	0.0
29			0.0	0.0	0.0	0.0
30			0.0	0.0	0.0	0.0
31			0.0	0.0	0.0	0.0
32			0.0	0.0	0.0	0.0
33			0.0	0.0	0.0	0.0
34			0.0	0.0	0.0	0.0
35			0.0	0.0	0.0	0.0
36			0.0	0.0	0.0	0.0
37			0.0	0.0	0.0	0.0
38			0.0	0.0	0.0	0.0
39			0.0	0.0	0.0	0.0
40			0.0	0.0	0.0	0.0
41			0.0	0.0	0.0	0.0
42			0.0	0.0	0.0	0.0

Sign Convention for scan data collected in Form 2

Imports: MWs are -
Exports: MWs are +

Loads in MW as -

Instructions for utilizing Adjustments:

1) Balancing Authorities making adjustments must retain evidence to ve
   - Adjustment values are determined from scan-cycle data using Valu
   - Adjustments are necessary to improve accuracy of calculations co
     Said differently, unless an adjustment compensates for significant
     adjustment for one or more of the five types is made for one event,
   which is only utilized for the events that you are contengent during th
   - Adjustments are included consistently for all events (e.g. if adjustm

2) Dynamic Schedules:
   - Values use schedule sign convention.
   - Adjustments should include only dynamic schedules accounting fo

3) Nonconforming Loads:
   - Values must be negative numbers.

4) Pumped Hydro:
   - Values for pumping must be negative values.
   - Values for generating must be positive values.

5) Rampling Units:
   - Values are positive values.

6) Transferred Frequency Response:
   - This value is the amount agreed upon between the entities express
     (e.g. if an entity agrees to provide 20 MW/0.1 Hz to another entity a
     data column of Form 2 and the receiving entity should enter - 20. T
   - Values for the entity receiving the response must be entered as a r
   - Values for the entity delivering the response must be entered as a p
   - Values between entities must sum to zero.

7) Contingent Balancing Authority Adjustment:
   - Data for Value A is the pre-contingency scan rate generation (+MW
   - Data for Value B is usually 0 MW, but may be the demand (-MW va

Pumped Hydro			Not Used			Transferred Frequency Response			Conting Adjus
Value A Adjustment	Value B Adjustment		Value A Adjustment	Value B Adjustment		Value A Adjustment	Value B Adjustment		Value A Adjustment
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0
0.0	0.0		0.0	0.0		0.0	0.0		0.0

Load MW as - Generation MW as +	Enter Gen MW as +	The transactional amount in MW Receiver enters - Deliverer enters + on Form 2 Data sheet	Generatio (If demand occ loss, enter MW

rify:

ue A and Value B averaging periods. Scan-cycle data must be available if adjustments are made.

mpared to using Net Actual Interchange solely.

known error, it should not be made. However, as noted in the next item, once a decision to include an

, the entity must calculate adjustments for that (those) type(s) for all events except for the Contengent BA Ad

at event.

nents for nonconforming load are made for one event, the load must be included for all events, etc.).

r joint-owned units. Other dynamic schedules should be ignored.

sed in MW/0.1 Hz. Form 2 will adjust this amount for the frequency deviation experienced.

nd a frequency event with a deviation of 50 mHz occurs, the delivering entity should enter +20 in the

he spreadsheet will adjust the SEFRD for each entity by the 10 for this event.)

negative number.

positive number.

/ values) from the contingent unit(s).

lues) that remains on the system that was "netted" out by the now offline generation.

gent BA tment		Net Total Adjustments
Value B Adjustment		Value B 20 to 52 seconds
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0
0.0		0.0

n MW as +
:urs due to gen
as - at value B)

justment

Month	Minimum FBS* for month	Maximum FBS* for month	Time weighted ** average FBS* for month	Time weighted ** minimum average FBS* for month	
January					
Feburary					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December			0.0	0.0	1899 Average Annual

* Frequency Bias Setting (FBS)
** Based on the one minute values used in BAL 001 when frequency is greater than 60.036 Hz

Balancing Authority: MyBA

	1898	Reporting period FRS Form 1 data
0.00	1898	Reporting period: Balancinig Authority FRM MW/0.1 Hz, enter from FRS F
1.00%	1898	Reporting period: Interconnection Minimum Fixed Frequency Bias Setting
	1898	Reporting period: Your BA's Annual Peak Demand or Peak Gen for Gen (
0.00		Your BA's lowest absolute Fixed Frequency Bias Setting based on BA Peak De
0.00		Your BA's lowest absolute Fixed Frequency Bias Setting based on 100% of FR
0.00	1899	Minimum, lowest absolute, conditional average Frequency Bias Setting M
	1898	Minimum, lowest absolute, conditional average Frequency Bias Setting M

ıl Bias MW/0.1 Hz

or less than 59.964 Hz.

Form 1 for that year's FRM. If not know enter zero.
% of Peak Demand or Peak Generation (Set by ERO)
only BAs from your BA Form 714.
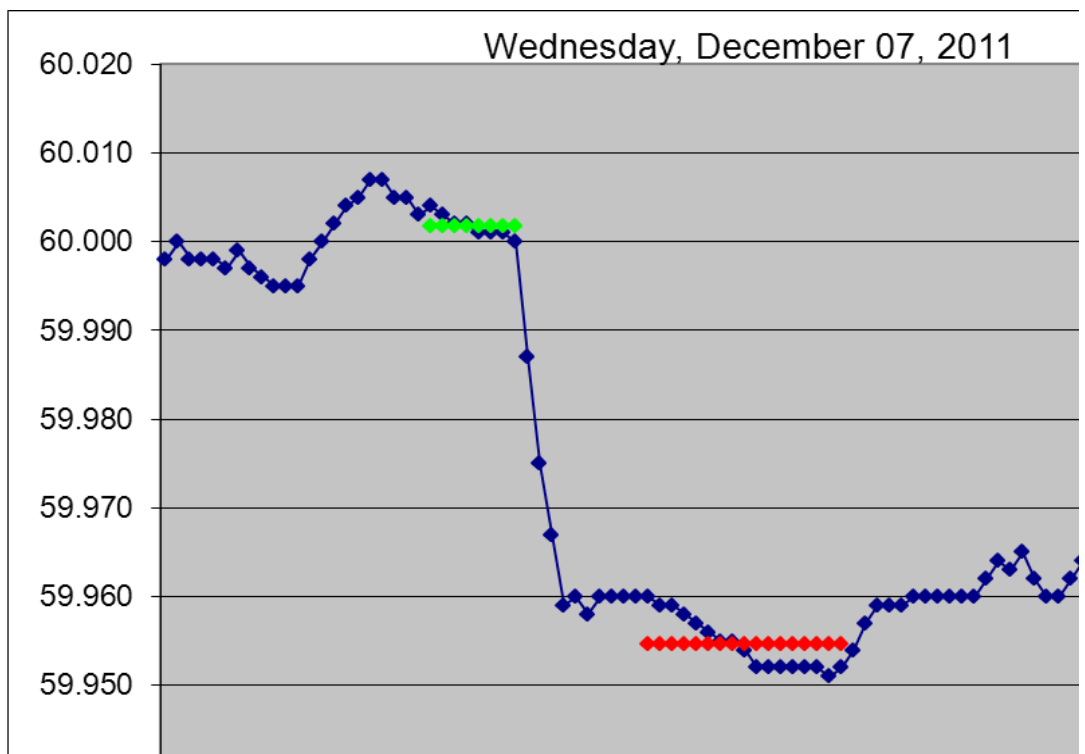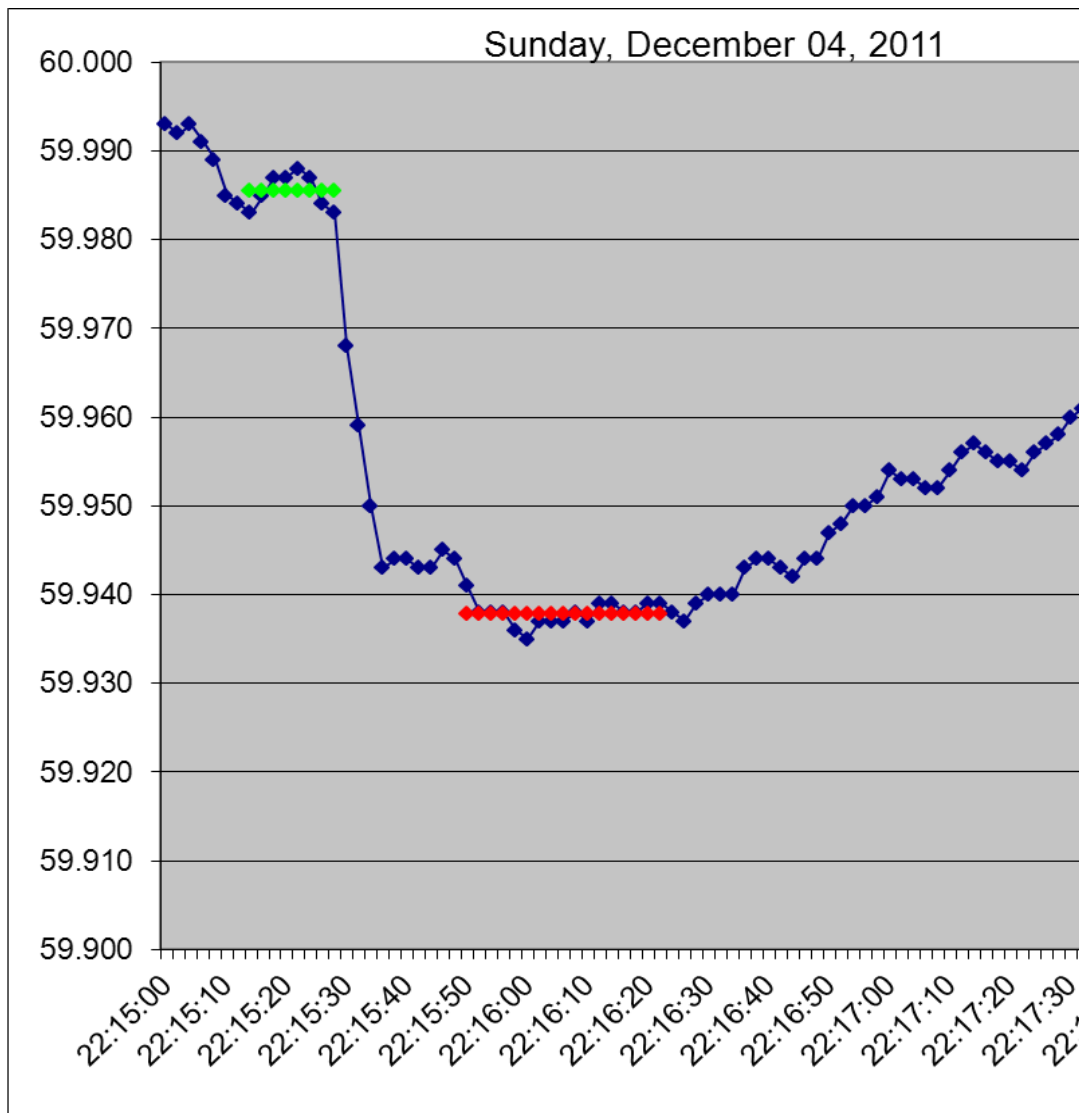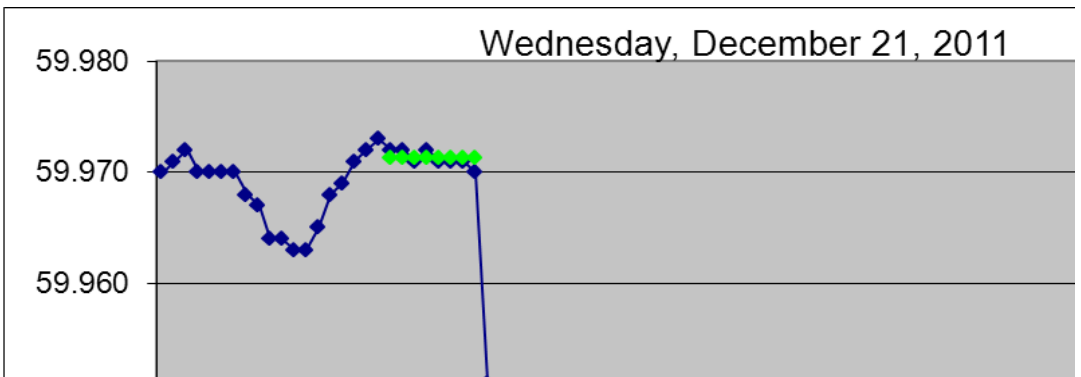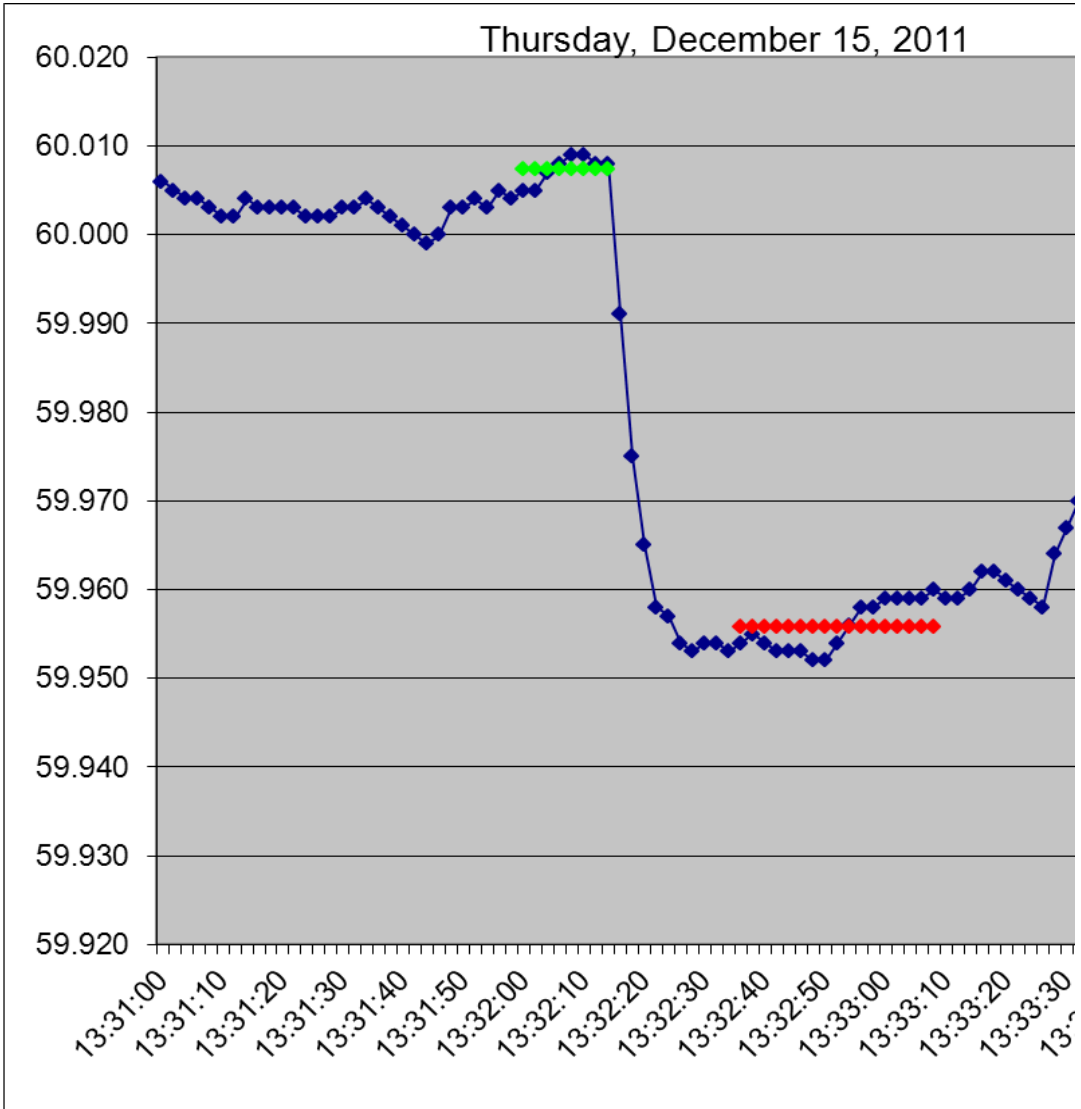emand (Peak Generation for Generation only BA) MW/0.1 Hz.
M.

W/0.1 Hz.
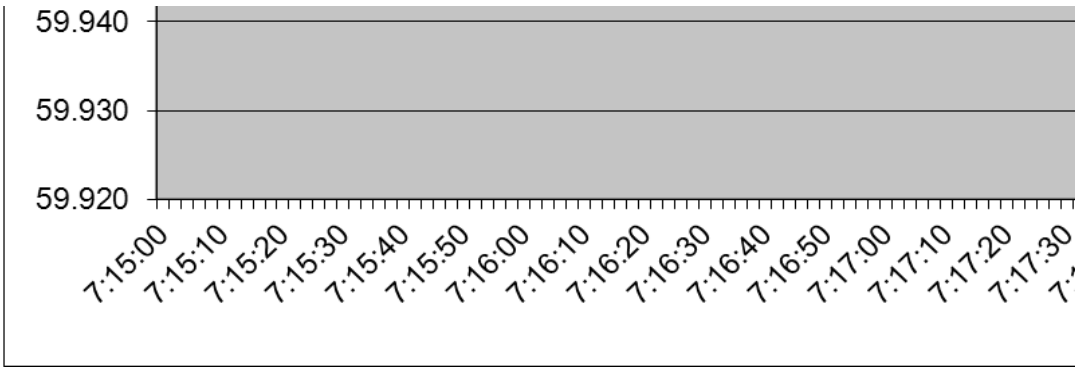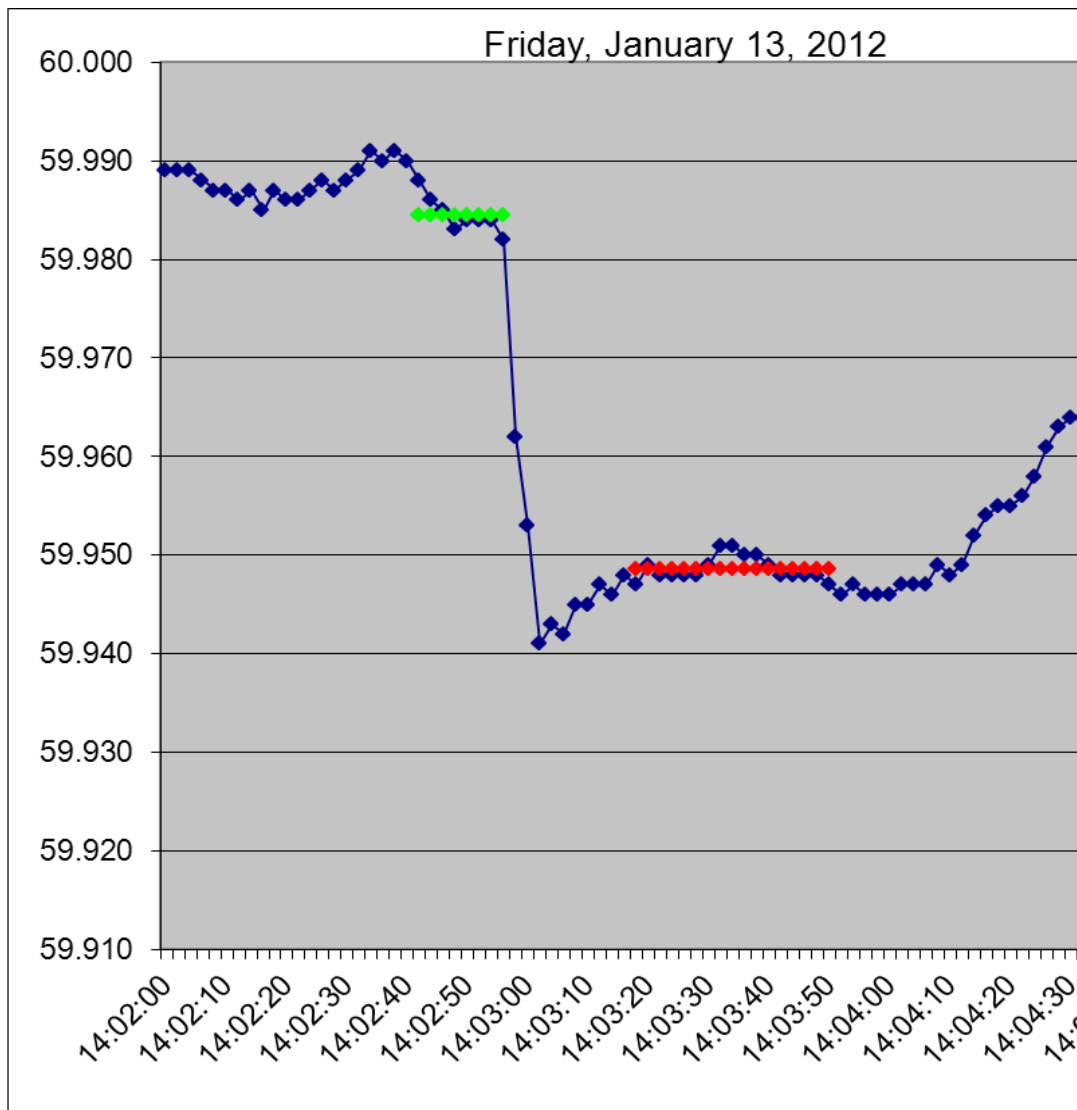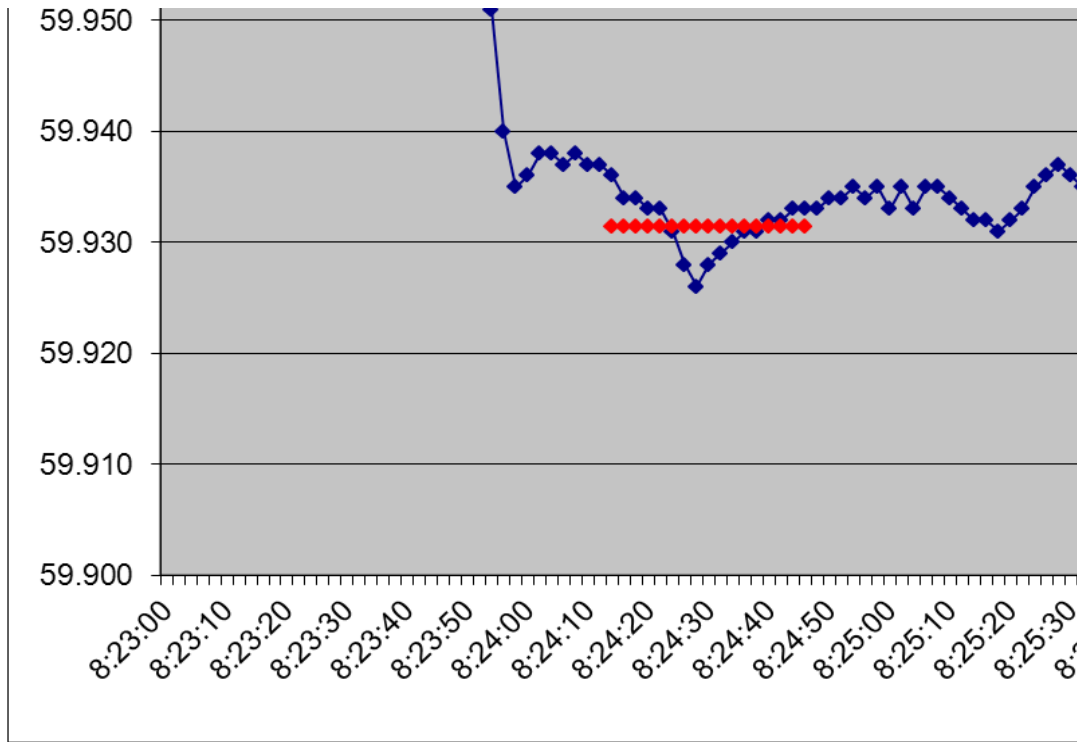W/0.1 Hz.

PasteSpecial/Values the data copied from FRS Form 2 for each event

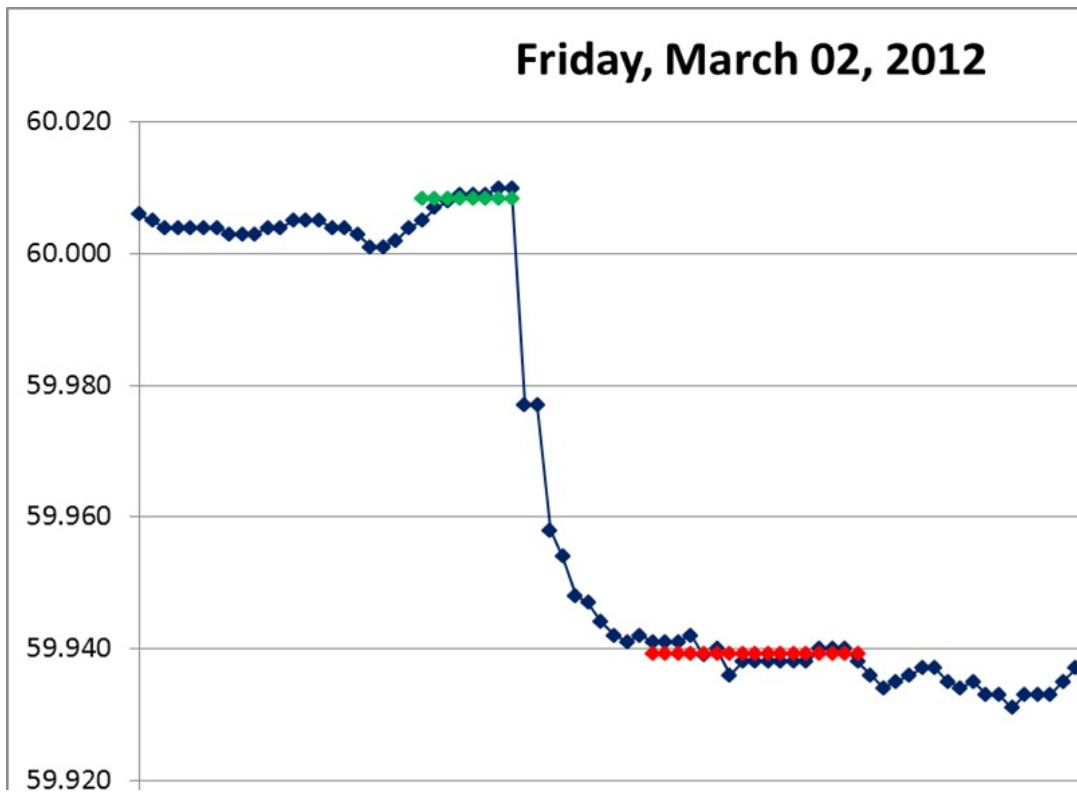| Event Number	Date/Time (Central Prevailing)	DelFreq	Date	A Point Time	FPointA Hz	A Value Hz
1	12/30/1899 0:00	0.000				
2	12/30/1899 0:00	0.000				
3	12/30/1899 0:00	0.000				
4	12/30/1899 0:00	0.000				
5	12/30/1899 0:00	0.000				
6	12/30/1899 0:00	0.000				
7	12/30/1899 0:00	0.000				
8	12/30/1899 0:00	0.000				
9	12/30/1899 0:00	0.000				
10	12/30/1899 0:00	0.000				
11	12/30/1899 0:00	0.000				
12	12/30/1899 0:00	0.000				
13	12/30/1899 0:00	0.000				
14	12/30/1899 0:00	0.000				
15	12/30/1899 0:00	0.000				
16	12/30/1899 0:00	0.000				
17	12/30/1899 0:00	0.000				
18	12/30/1899 0:00	0.000				
19	12/30/1899 0:00	0.000				
20	12/30/1899 0:00	0.000				
21	12/30/1899 0:00	0.000				
22	12/30/1899 0:00	0.000				
23	12/30/1899 0:00	0.000				
24	12/30/1899 0:00	0.000				
25	12/30/1899 0:00	0.000				
26	12/30/1899 0:00	0.000				
27	12/30/1899 0:00	0.000				
28	12/30/1899 0:00	0.000				
29	12/30/1899 0:00	0.000				
30	12/30/1899 0:00	0.000				
31	12/30/1899 0:00	0.000				
32	12/30/1899 0:00	0.000				
33	12/30/1899 0:00	0.000				
34	12/30/1899 0:00	0.000				
35	12/30/1899 0:00	0.000				
36	12/30/1899 0:00	0.000				
37	12/30/1899 0:00	0.000				
38	12/30/1899 0:00	0.000				
39	12/30/1899 0:00	0.000				
40	12/30/1899 0:00	0.000				
41	12/30/1899 0:00	0.000				
42	12/30/1899 0:00	0.000				

t(0) Time	C Value Hz	Value A Data	BA Performance				
		Frequency Hz	Net Actual Interchange MW	JOU Dynamic Schedules Imp(-) Exp (+) MW	Non-Conforming Load Load (-) MW	Pumped Hydro Load (-) Gen (+) MW	Ramping Units Gen (+) MW

Transferred Frequency Response Rec (-) Del (+) MW	Contingent BA Lost Generation Load (-) Gen (+) MW	BA Bias Setting MW/0.1 Hz	BA Load MW	Bias Setting EPFR MW	Value B	20 to 52 s
					Frequency Hz	Net Actual Interchange MW

Second Average Period Evaluation

JOU Dynamic Schedules Imp(-) Exp (+) MW	Non-Conforming Load Load (-) MW	Pumped Hydro Load (-) Gen (+) MW	Ramping Units Gen (+) MW	Transferred Frequency Response Rec (-) Del (+) MW	Contingent BA Lost Generation Load (-) Gen (+) MW	Initial Performance Adjusted P.U.

Initial Performance Unadjusted P.U.	Sustained Performance P.U.	BA Bias Setting MW/0.1 Hz	BA Load MW	Bias Setting EPFR MW	Average Bias While Hz > +/-0.036 Hz MW/0.1 Hz	Unadjusted PFR Performance @ T(+46) P.U.
#DIV/0!	#DIV/0!					#DIV/0!

Frequency Response Initiative - Additional Primary Frequency Response Evaluati

Unadjusted PFR Performance @ T(+76) P.U.	Unadjusted PFR Performance @ T(+106) P.U.	Unadjusted PFR Performance @ T(+136) P.U.	Unadjusted PFR Performance @ T(+166) P.U.	Adjusted PFR Performance @ T(+46) P.U.	Adjusted PFR Performance @ T(+76) P.U.	Adjusted PFR Performance @ T(+106) P.U.

on Points				
Adjusted PFR Performance @ T(+136) P.U.	Adjusted PFR Performance @ T(+166) P.U.	Maximum Bias Setting MW/0.1 Hz	Minimum Bias Setting MW/0.1 Hz	

Full name	Abbreviation	Offset	Time zone
Atlantic Daylight Time	ADT	3:00	UTC - 3 hours
Atlantic Standard Time	AST	4:00	UTC - 4 hours
Central Daylight Time	CDT	5:00	UTC - 5 hours
Central Standard Time	CST	6:00	UTC - 6 hours
Eastern Daylight Time	EDT	4:00	UTC - 4 hours
Eastern Standard Time	EST	5:00	UTC - 5 hours
Mountain Daylight Time	MDT	6:00	UTC - 6 hours
Mountain Standard Time	MST	7:00	UTC - 7 hours
Pacific Daylight Time	PDT	7:00	UTC - 7 hours
Pacific Standard Time	PST	8:00	UTC - 8 hours

Sunday, December 04, 2011

Wednesday, December 07, 2011

Chart 1 (top):

Y-axis: 59.940, 59.930, 59.920

X-axis: 7:15:00, 7:15:10, 7:15:20, 7:15:30, 7:15:40, 7:15:50, 7:16:00, 7:16:10, 7:16:20, 7:16:30, 7:16:40, 7:16:50, 7:17:00, 7:17:10, 7:17:20, 7:17:30, 7:1

Chart 2 (middle): Thursday, December 15, 2011

Y-axis: 60.020, 60.010, 60.000, 59.990, 59.980, 59.970, 59.960, 59.950, 59.940, 59.930, 59.920

X-axis: 13:31:00, 13:31:10, 13:31:20, 13:31:30, 13:31:40, 13:31:50, 13:32:00, 13:32:10, 13:32:20, 13:32:30, 13:32:40, 13:32:50, 13:33:00, 13:33:10, 13:33:20, 13:33:30, 13:3

Chart 3 (bottom): Wednesday, December 21, 2011

Y-axis: 59.980, 59.970, 59.960

Friday, January 13, 2012

Monday, January 30, 2012

Friday, March 02, 2012

Friday, March 23, 2012

Saturday, April 14, 2012

Monday, April 30, 2012

9:01:36 9:01:46 9:01:56 9:02:06 9:02:16 9:02:26 9:02:36 9:02:46 9:02:56 9:03:06 9:03:16 9:03:26 9:03:36 9:03:46 9:03:56 9:04:

59.880

Friday, May 04, 2012

60.020
60.010
60.000
59.990
59.980
59.970
59.960
59.950
59.940
59.930
59.920
59.910

12:33:06 12:33:16 12:33:26 12:33:36 12:33:46 12:33:56 12:34:06 12:34:16 12:34:26 12:34:36 12:34:46 12:34:56 12:35:06 12:35:16 12:35:26 12:35:

Monday, May 21, 2012

60.010
60.000
59.990
59.980

Freq
Aave
Bave

Freq
Aave
Bave

Freq
Aave
Bave

Freq
Aave
Bave

03:40
10:03:50

Freq
Aave
Bave

50

13:55:00

13:55:10

Freq

Aave

Bave

58

13:30:08

13:30:18

Freq
Aave
Bave

12:48:24   12:48:34   12:48:44

Freq
Aave
Bave

Freq

Aave

Bave

Freq
Aave
Bave

14:53:52   14:54:02

Initial Performance Adjusted P.U. Based on Bias

#DIV/0! MW/0.1 Hz Median   #DIV/0! Average P.U. Performance

P.U.

12

10

8

6

4

2

0

1   2   3   4   5   6   7   8   9

Event

■ Initial Performance Adjusted P.U.

Performance based on H

T+46 Performance Adjusted P.U. Based on Bias Settin

P.U.

12

10

8

6

4

2

T+106 Performance Adjusted P.U. Based on Bias Setting MyBA

P.U.

12												
10												
8												
6												
4												
2												
0	1	2	3	4	5	6	7	8	9	10	11	12

■ Adjusted PFR Performance @ T(+106) P.U.

Event

T+166 Performance Adjusted P.U. Based on Bias Setting MyBA

P.U.

12												
10												
8												
6												
4												
2												
0	1	2	3	4	5	6	7	8	9	10	11	12

■ Adjusted PFR Performance @ T(+166) P.U.

Event

Setting

Sustained Performance Adjusted PBA (MyBA)

P.U.

12

10

8

6

4

2

0

1   2   3   4   5   6   7

Event

■ Sustained Performance
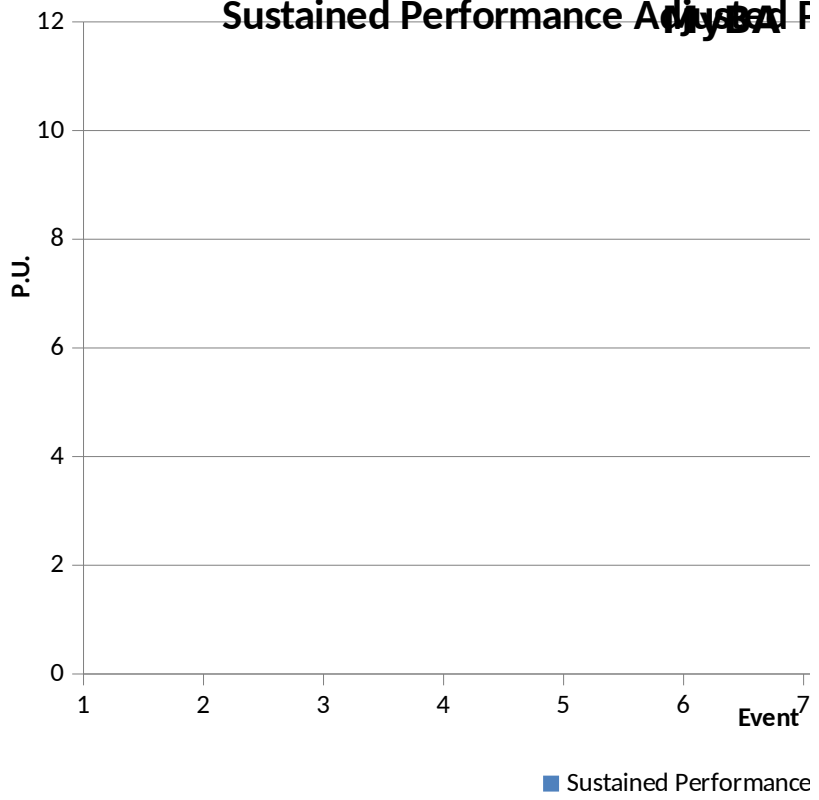
z at T+46

g

T+76 Performance Adjusted PBA (MyBA)

P.U.

12

10

8

6

4

2

Hz at T+106
ng

on Hz at T+166
ing

T+136 Performance Adjusted P.U.
MyBA.

P.U.

12

10

8

6

4

2

0

1   2   3   4   5   6   7   8   9   10

■ Adjusted PFR Performance @
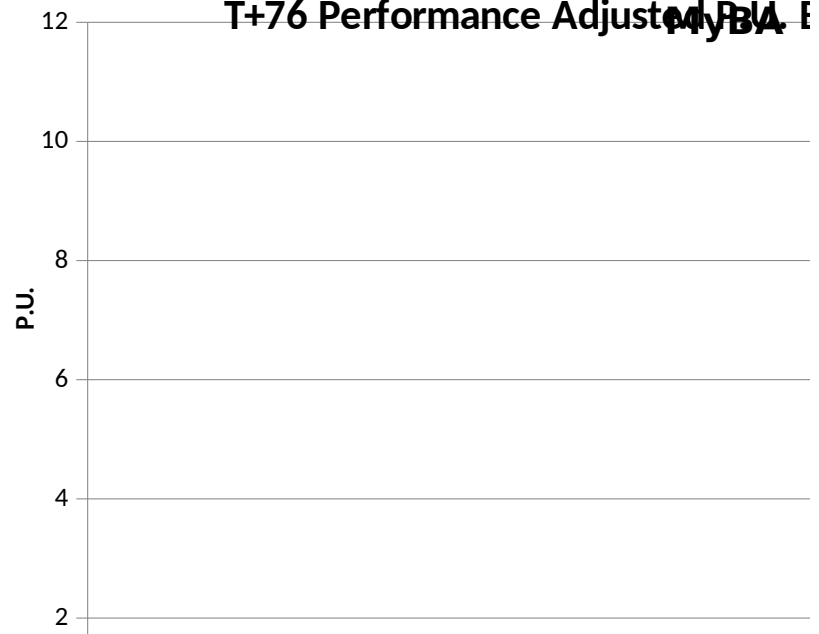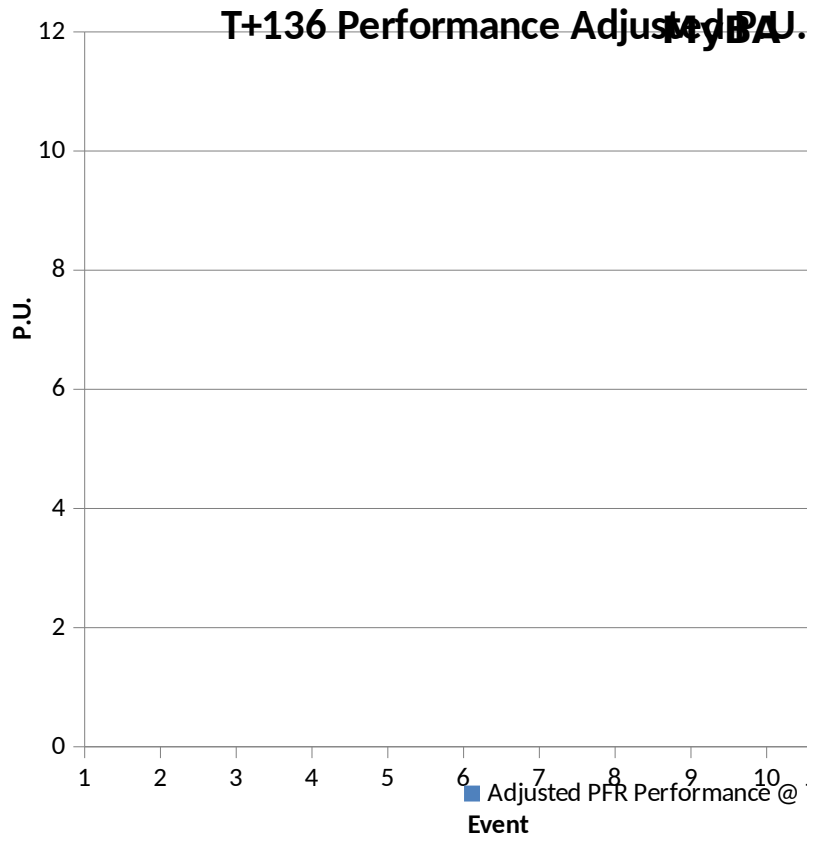
Event

Event Recovery Period Average Performance

?.U. Based on Bias Setting

8	9	10	11	12	
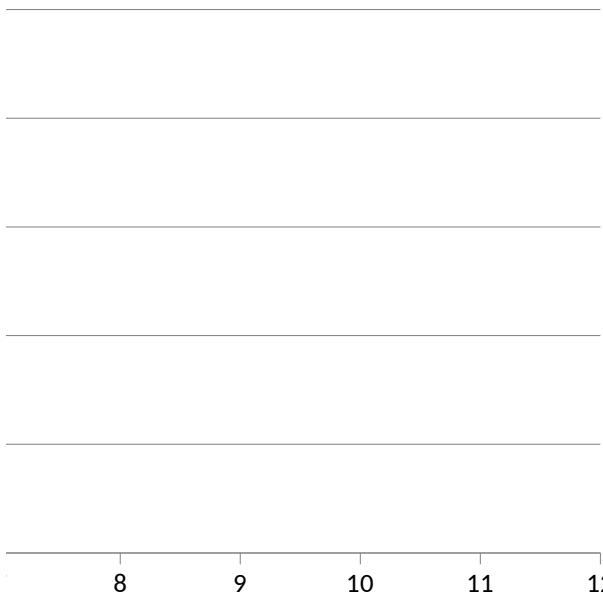
: P.U.

FRI - NERC Frequency Response

The FRI Report made recommend
Additional evaluations have been
These evaluations utilize Intercon
These evaluations are not part of
The following time selections are
Each evaluation is a P.U. measur
Performance is the "best" perform
This is intended to account for any

Also included is the measure of P
The measure (P.U.) here is based

Some basic observations from thi

1) If the P.U. value is close to 1.0
2) The average performance of th
than 0.40 P.U. then they are provi
3) If the P.U. value at T+46 is con
4) If the P.U. value at later time in
5) If the P.U. value at T+20 to T+

Performance based on Hz at T+136

Based on Bias Setting

T(+136) P.U.

11   12

e Initiative

dations to evaluate Primary Frequency Response at additional time intervals during the event recovery
added to both Form 1 and Form 2 to evaluate PFR delivery for these suggested time periods.
nection frequency at specific times during the recovery period and calculates the BA's delivery of PFR
BAL-003 and will not impact compliance to R1 of the draft standard.
evaluated: T+46, T+76, T+106, T+136 and T+166.
e based on the BA's Bias setting at each of these times.
ance at the specific time through 10 seconds past each time.
y delay in data in the measurement. This measurement may be changed as experience in this effort in

FR delivery during the T+20 to T+52 second period, the same as R1 of the standard.
l on the BA Bias setting and not the FRO. This was done to provide comparison to the additional meas

s data:

), the BA delivered the full amount of PFR equal to its Bias setting.
ne Eastern Interconnection in PFR is about 40% of the total Interconnection Bias setting. If the BA's av
iding more PFR than the average BA. If the P.U. is less than 40% then they are providing less than av
nsistently less than the P.U. value at T+20 to T+52, then the PFR of the BA is not being sustained.
nterval measures is consistently less, then withdrawal of PFR is occurring at a slower rate, but still bein
52, T+46, or T+76 is consistently greater than 1.0, this indicates that the BA Bias setting is too low.

period.

for each selection.

ncreases.

surement times.

verage score is greater
erage PFR.

g withdrawn.