

# **Balancing Authority ACE Limit Proof-of-Concept Field Trial Project 2010-14**

Eastern Interconnection Update Discussion

February 4, 2011

Starting at 2:30 PM EST

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Balancing Authority Reliability-based Control Standard Drafting Team  
(BARCSDT)

# Balancing Authority ACE Limit Proof-of-Concept Field Trial

## Eastern Interconnection Field Trial Participation

Participation reflects approximately 67% of the projected 2010 peak load for the Eastern Interconnection

Eastern Interconnection Balancing Authority Participants	2010 Frequency Bias	Region	Reliability Coordinator	Start Date
American Electric Power (CSWS)	-103.4	SPP	SPP	September 1, 2005
Associated Electric Cooperative, Inc. (AECI)	-45	SERC	TVA	April 1, 2010
Duke Energy Carolinas (DUK)	-196	SERC	VACS	April 1, 2009
East Kentucky Power Cooperative (EKPC)	-42.73	SERC	TVA	July 6, 2005
Entergy (EES)	-227.1	SERC	ICTE	July 6, 2005
EON-US (LGEE)	-74	SERC	TVA	April 1, 2008
Independent Electricity System Operator (IESO)	-245.8	NPCC	IESO	March 1, 2008
Manitoba Hydro (MHEB)	-43.3	MRO	MISO	July 6, 2005
Midwest Independent Transmission System Operator (MISO)	-1038.6	MRO, RFC, SERC	MISO	January 6, 2009
PJM Interconnection (PJM)	-1358	RFC	PJM	August 1, 2005
Santee Cooper (SC)	-61.52	SERC	VACS	March 1, 2006
Southern Company (SOCO)	-445	SERC	SOCO	October 15, 2005
Tennessee Valley Authority (TVA)	-317.6	SERC	TVA	October 1, 2005

# Balancing Authority ACE Limit Proof-of-Concept Field Trial

The Balancing Authority ACE Limit (BAAL) shall not be exceeded for more than 30 consecutive clock-minutes\*

	Longest exceedance of the Balancing Authority ACE Limit since starting operation under the Field Trial		December 2010 Performance under Field Trial	
	Max MinCtLow	Max MinCtHigh	Max MinCtLow	Max MinCtHigh
BA01	26	16	8	4
BA02	17	17	9	7
BA03	19	19	10	6
BA04	10	20	7	12
BA05	16	22	10	9
BA06	28	22	17	21
BA07	15	23	4	13
BA08	20	24	9	13
BA09	28	26	14	10
BA10	21	31	10	6
BA11	14	32	7	6
BA12	29	40	16	14
BA13	28	43	7	7

MinCtLow = Count of consecutive clock-minutes BAAL<sub>Low</sub> was exceeded

MinCtHigh = Count of consecutive clock-minutes BAAL<sub>High</sub> was exceeded

\*BAAL being exceeded for more than 30 consecutive clock-minutes would be a violation under the proposed BAL-007 standard.

# Frequency Statistics

# Eastern Interconnection

Year	Month	Total Minutes FTL_Low at 59.98 Hz SF	Total Minutes FTL_Low at 60 Hz SF	Total FTL_Low Minutes	Percentage Low During TEC	FTL_Low Events	FTL_Low Max Duration	Total Minutes FTL_High at 60.02 Hz SF	Total Minutes FTL_High at 60 Hz SF	Total FTL_High Minutes	Percentage High During TEC	FTL_High Events	FTL_High Max Duration	Total FTL_Low and FTL_High Minutes at 60 Hz SF	Total FTL_Low and FTL_High Minutes
2005	7	28	30	58	48.28%	32	5	0	16	16	0.00%	11	3	46	74
2005	8	47	91	138	34.06%	56	10	0	35	35	0.00%	21	5	126	173
2005	9	32	39	71	45.07%	33	8	0	39	39	0.00%	21	7	78	110
2005	10	42	48	90	46.67%	43	11	0	33	33	0.00%	23	5	81	123
2005	11	65	43	108	60.19%	58	6	0	35	35	0.00%	22	7	78	143
2005	12	37	36	73	50.68%	41	7	0	27	27	0.00%	19	3	63	100
2006	1	42	33	75	56.00%	43	6	0	61	61	0.00%	27	5	94	136
2006	2	0	64	64	0.00%	39	6	2	43	45	4.44%	24	4	107	109
2006	3	28	51	79	35.44%	50	4	17	37	54	31.48%	33	8	88	133
2006	4	19	86	105	18.10%	58	5	0	76	76	0.00%	46	8	162	181
2006	5	52	67	119	43.70%	54	8	0	72	72	0.00%	39	5	139	191
2006	6	45	34	79	56.96%	41	5	0	59	59	0.00%	24	10	93	138
2006	7	31	40	71	43.66%	34	9	0	50	50	0.00%	29	4	90	121
2006	8	16	85	101	15.84%	49	5	0	58	58	0.00%	26	8	143	159
2006	9	19	60	79	24.05%	39	6	0	53	53	0.00%	33	4	113	132
2006	10	53	42	95	55.79%	51	6	0	54	54	0.00%	28	8	96	149
2006	11	56	35	91	61.54%	47	5	1	36	37	2.70%	22	3	71	128
2006	12	34	18	52	65.38%	34	4	0	54	54	0.00%	29	6	72	106
2007	1	59	29	88	67.05%	44	7	0	55	55	0.00%	31	7	84	143
2007	2	17	31	48	35.42%	33	3	0	39	39	0.00%	21	4	70	87
2007	3	75	83	158	47.47%	76	15	0	78	78	0.00%	38	8	161	236
2007	4	36	41	77	46.75%	45	5	0	58	58	0.00%	31	4	99	135
2007	5	70	46	116	60.34%	64	5	0	95	95	0.00%	49	7	141	211
2007	6	62	30	92	67.39%	47	6	0	51	51	0.00%	25	7	81	143
2007	7	47	20	67	70.15%	33	6	0	39	39	0.00%	20	4	59	106
2007	8	37	25	62	59.68%	31	6	1	55	56	1.79%	32	5	80	118
2007	9	20	75	95	21.05%	41	8	0	27	27	0.00%	16	5	102	122
2007	10	57	65	122	46.72%	73	5	1	56	57	1.75%	36	5	121	179
2007	11	74	21	95	77.89%	60	4	0	34	34	0.00%	24	5	55	129
2007	12	37	22	59	62.71%	38	6	0	61	61	0.00%	38	4	83	120
2008	1	0	75	75	0.00%	34	8	0	48	48	0.00%	24	4	123	123
2008	2	18	71	89	20.22%	46	8	0	51	51	0.00%	24	8	122	140
2008	3	37	65	102	36.27%	55	6	0	40	40	0.00%	34	2	105	142
2008	4	41	65	106	38.68%	60	5	0	59	59	0.00%	33	6	124	165
2008	5	67	39	106	63.21%	63	4	0	40	40	0.00%	20	5	79	146
2008	6	40	21	61	65.57%	34	5	0	35	35	0.00%	19	5	56	96
2008	7	42	17	59	71.19%	29	7	0	17	17	0.00%	12	3	34	76
2008	8	41	19	60	68.33%	35	5	0	29	29	0.00%	17	6	48	89
2008	9	25	44	69	36.23%	39	4	0	55	55	0.00%	21	11	99	124
2008	10	35	33	68	51.47%	38	5	0	27	27	0.00%	19	3	60	95
2008	11	13	9	22	59.09%	13	5	0	13	13	0.00%	9	4	22	35
2008	12	16	34	50	32.00%	35	4	0	11	11	0.00%	8	3	45	61
2009	1	2	26	28	7.14%	16	4	0	19	19	0.00%	9	3	45	47
2009	2	0	34	34	0.00%	18	4	0	18	18	0.00%	11	6	52	52
2009	3	0	41	41	0.00%	23	5	0	25	25	0.00%	11	9	66	66
2009	4	0	59	59	0.00%	37	5	0	27	27	0.00%	20	3	86	86
2009	5	8	35	43	18.60%	31	4	0	27	27	0.00%	15	8	62	70
2009	6	30	28	58	51.72%	28	5	0	25	25	0.00%	16	3	53	83
2009	7	14	22	36	38.89%	22	3	0	28	28	0.00%	16	6	50	64
2009	8	16	10	26	61.54%	20	2	0	13	13	0.00%	10	2	23	39
2009	9	11	22	33	33.33%	21	3	0	20	20	0.00%	14	4	42	53
2009	10	44	45	89	49.44%	44	6	0	18	18	0.00%	10	3	63	107
2009	11	30	19	49	61.22%	33	3	0	34	34	0.00%	21	4	53	83
2009	12	11	23	34	32.35%	20	5	0	22	22	0.00%	15	3	45	56
2010	1	36	26	62	58.06%	35	6	0	16	16	0.00%	9	3	42	78
2010	2	23	16	39	58.97%	24	3	0	26	26	0.00%	16	2	42	65
2010	3	38	71	109	34.86%	65	6	0	40	40	0.00%	22	6	111	149
2010	4	63	38	101	62.38%	65	5	0	54	54	0.00%	34	6	92	155
2010	5	72	30	102	70.59%	60	6	0	40	40	0.00%	29	4	70	142
2010	6	10	28	38	26.32%	27	2	0	10	10	0.00%	9	2	38	48
2010	7	8	19	27	29.63%	17	4	0	30	30	0.00%	13	5	49	57
2010	8	16	29	45	35.56%	24	4	0	17	17	0.00%	11	3	46	62
2010	9	0	56	56	0.00%	31	4	0	22	22	0.00%	11	4	78	78
2010	10	1	60	61	1.64%	40	5	0	19	19	0.00%	15	4	79	80
2010	11	0	59	59	0.00%	44	3	5	26	31	16.13%	20	3	85	90
2010	12	8	12	20	40.00%	18	2	3	30	33	9.09%	20	5	42	53

This chart is a summary of frequency-related statistics gathered since the start of the Field Trial. Of particular interest is the drop in operation outside of the FTL bounds, trending lower in the latter part of 2008 with November 2008 having the least number of clock-minutes of operation outside the FTL bounds, followed by August 2009, over the dataset.

# Frequency Statistics

# Eastern Interconnection

Year	Month	Total Minutes FTL_Low at 59.98 Hz SF	Total Minutes FTL_Low at 60 Hz SF	Total Minutes FTL_Low at 59.98 Hz SF	Total Minutes FTL_Low at 60 Hz SF	Total FTL_Low Minutes	Percentage Low During TEC	FTL_Low Events	FTL_Low Max Duration	FTL_High Max Duration	Total FTL_Low and FTL_High Minutes at 60 Hz SF	Total FTL_Low and FTL_High Minutes
2008	1	0	75	75	75	75	0.00%	34	8			74
2008	2	18	71	89	89	89	20.22%	46	8			172
2008	3	37	65	102	102	102	36.27%	55	6			177
2008	4	41	65	106	106	106	38.68%	60	5			171
2008	5	67	39	106	106	106	63.21%	63	4			170
2008	6	40	21	61	61	61	65.57%	34	5			159
2008	7	42	17	59	59	59	71.19%	29	7			148
2008	8	41	19	60	60	60	68.33%	35	5			147
2008	9	25	44	69	69	69	36.23%	39	4			143
2008	10	35	33	68	68	68	51.47%	38	5			143
2008	11	13	9	22	22	22	59.09%	13	5			135
2008	12	16	34	50	50	50	32.00%	35	4			144
2009	1	2	26	28	28	28	7.14%	16	4			110
2009	2	0	34	34	34	34	0.00%	18	4			112
2009	3	0	41	41	41	41	0.00%	23	5			115
2009	4	0	59	59	59	59	0.00%	37	5			112
2009	5	8	35	43	43	43	18.60%	31	4			114
2009	6	30	28	58	58	58	51.72%	28	5			116
2009	7	14	22	36	36	36	38.89%	22	3			111
2009	8	16	10	26	26	26	61.54%	20	2			108
2009	9	11	22	33	33	33	33.33%	21	3			111
2009	10	44	45	89	89	89	49.44%	44	6			129
2009	11	30	19	49	49	49	61.22%	33	3			112
2009	12	11	23	34	34	34	32.35%	20	5			111
2010	1	36	26	62	62	62	58.06%	35	6			121
2010	2	23	16	39	39	39	58.97%	24	3			108
2010	3	38	71	109	109	109	34.86%	65	6			144
2010	4	63	38	101	101	101	62.38%	65	5			136
2010	5	72	30	102	102	102	70.59%	60	6			148
2010	6	10	28	38	38	38	26.32%	27	2			107
2010	7	8	19	27	27	27	29.63%	17	4			108
2010	8	16	29	45	45	45	35.56%	24	4			115
2010	9	0	56	56	56	56	0.00%	31	4			111
2010	10	1	60	61	61	61	1.64%	40	5			117
2010	11	0	59	59	59	59	0.00%	44	3			116
2010	12	8	12	20	20	20	40.00%	18	2			106

This chart is a summary of frequency-related statistics gathered since the start of the Field Trial. Of particular interest is the drop in operation outside of the FTL bounds, trending lower in the latter part of 2008 with November 2008 having the least number of clock-minutes of operation outside the FTL bounds, followed by August 2009, over the dataset.

# Frequency Statistics

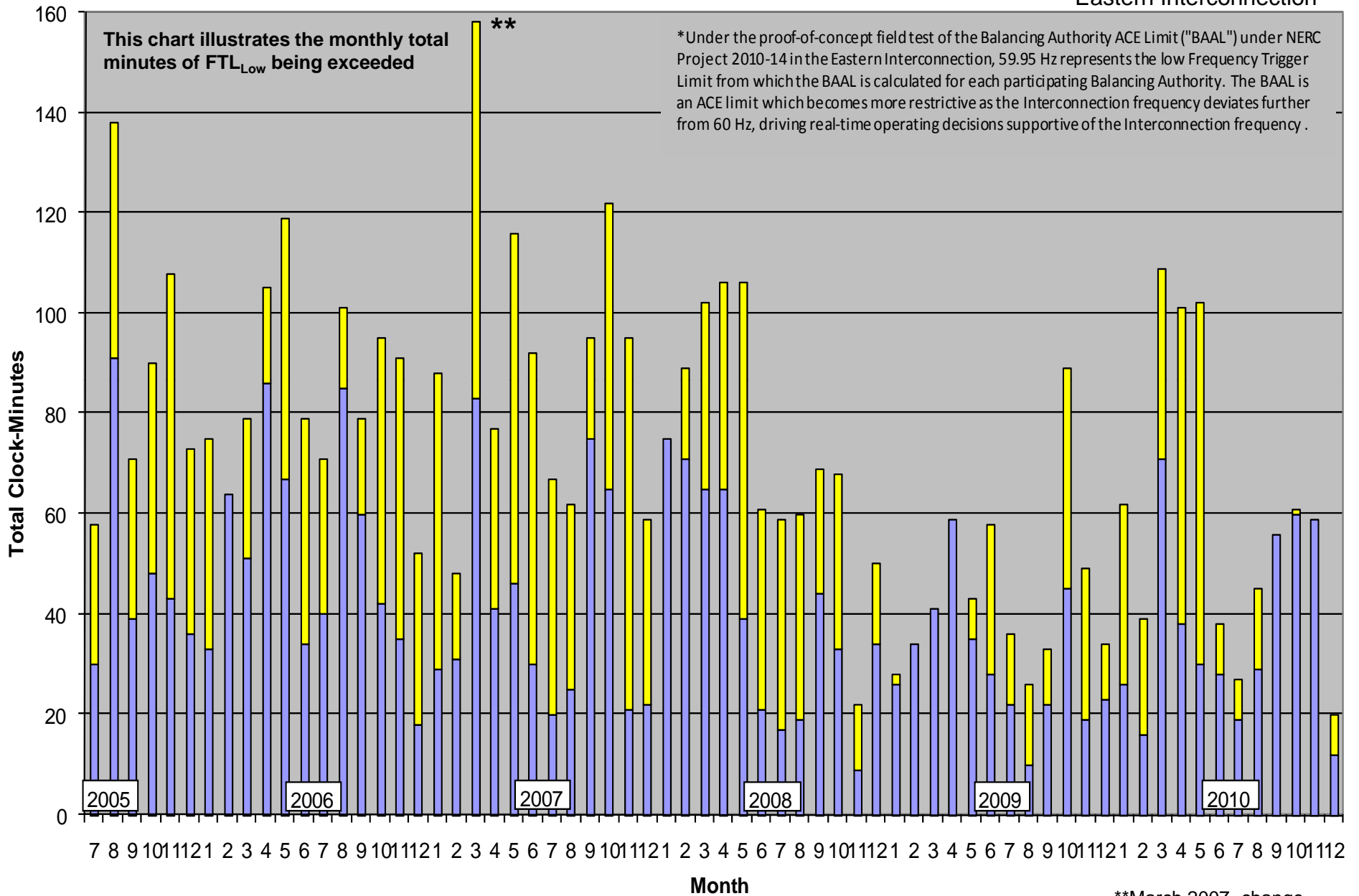
# Eastern Interconnection

Year	Month	Total Minutes FTL_Low 59.99 Hz SF	Total Minutes FTL_High at 60.02 Hz SF	Total Minutes FTL_High at 60 Hz SF	Total FTL_High Minutes	Percentage High During TEC	FTL_High Events	FTL_High Max Duration	Total FTL_Low and FTL_High Minutes at 60 Hz SF	Total FTL_Low and FTL_High Minutes	FTL_Low FTL_High Uses at 60 Hz SF	Total FTL_Low and FTL_High Minutes
2008	1	0	48	48	48	0.00%	24	4	123	123	48	74
2008	2	0	51	51	51	0.00%	24	8	122	140	48	172
2008	3	0	40	40	40	0.00%	34	2	105	142	48	190
2008	4	0	59	59	59	0.00%	33	6	124	165	48	213
2008	5	0	40	40	40	0.00%	20	5	79	146	48	194
2008	6	0	35	35	35	0.00%	19	5	56	96	48	144
2008	7	0	17	17	17	0.00%	12	3	34	76	48	124
2008	8	0	29	29	29	0.00%	17	6	48	89	48	137
2008	9	0	55	55	55	0.00%	21	11	99	124	48	172
2008	10	0	27	27	27	0.00%	19	3	60	95	48	143
2008	11	0	13	13	13	0.00%	9	4	22	35	48	83
2008	12	0	11	11	11	0.00%	8	3	45	61	48	109
2009	1	0	19	19	19	0.00%	9	3	45	47	48	95
2009	2	0	18	18	18	0.00%	11	6	52	52	48	100
2009	3	0	25	25	25	0.00%	11	9	66	66	48	114
2009	4	0	27	27	27	0.00%	20	3	86	86	48	134
2009	5	0	27	27	27	0.00%	15	8	62	70	48	110
2009	6	0	25	25	25	0.00%	16	3	53	83	48	131
2009	7	0	28	28	28	0.00%	16	6	50	64	48	112
2009	8	0	13	13	13	0.00%	10	2	23	39	48	87
2009	9	0	20	20	20	0.00%	14	4	42	53	48	101
2009	10	0	18	18	18	0.00%	10	3	63	107	48	155
2009	11	0	34	34	34	0.00%	21	4	53	83	48	131
2009	12	0	22	22	22	0.00%	15	3	45	56	48	104
2010	1	0	16	16	16	0.00%	9	3	42	78	48	126
2010	2	0	26	26	26	0.00%	16	2	42	65	48	113
2010	3	0	40	40	40	0.00%	22	6	111	149	48	197
2010	4	0	54	54	54	0.00%	34	6	92	155	48	203
2010	5	0	40	40	40	0.00%	29	4	70	142	48	190
2010	6	0	10	10	10	0.00%	9	2	38	48	48	96
2010	7	0	30	30	30	0.00%	13	5	49	57	48	105
2010	8	0	17	17	17	0.00%	11	3	46	62	48	110
2010	9	0	22	22	22	0.00%	11	4	78	78	48	126
2010	10	0	19	19	19	0.00%	15	4	79	80	48	127
2010	11	5	26	31	31	16.13%	20	3	85	90	48	138
2010	12	3	30	33	33	9.09%	20	5	42	53	48	101

This chart is a summary of frequency-related statistics gathered since the start of the Field Trial. Of particular interest is the drop in operation outside of the FTL bounds, trending lower in the latter part of 2008 with November 2008 having the least number of clock-minutes of operation outside the FTL bounds, followed by August 2009, over the dataset.

# Total Clock-Minutes of Frequency below 59.95 Hz\*

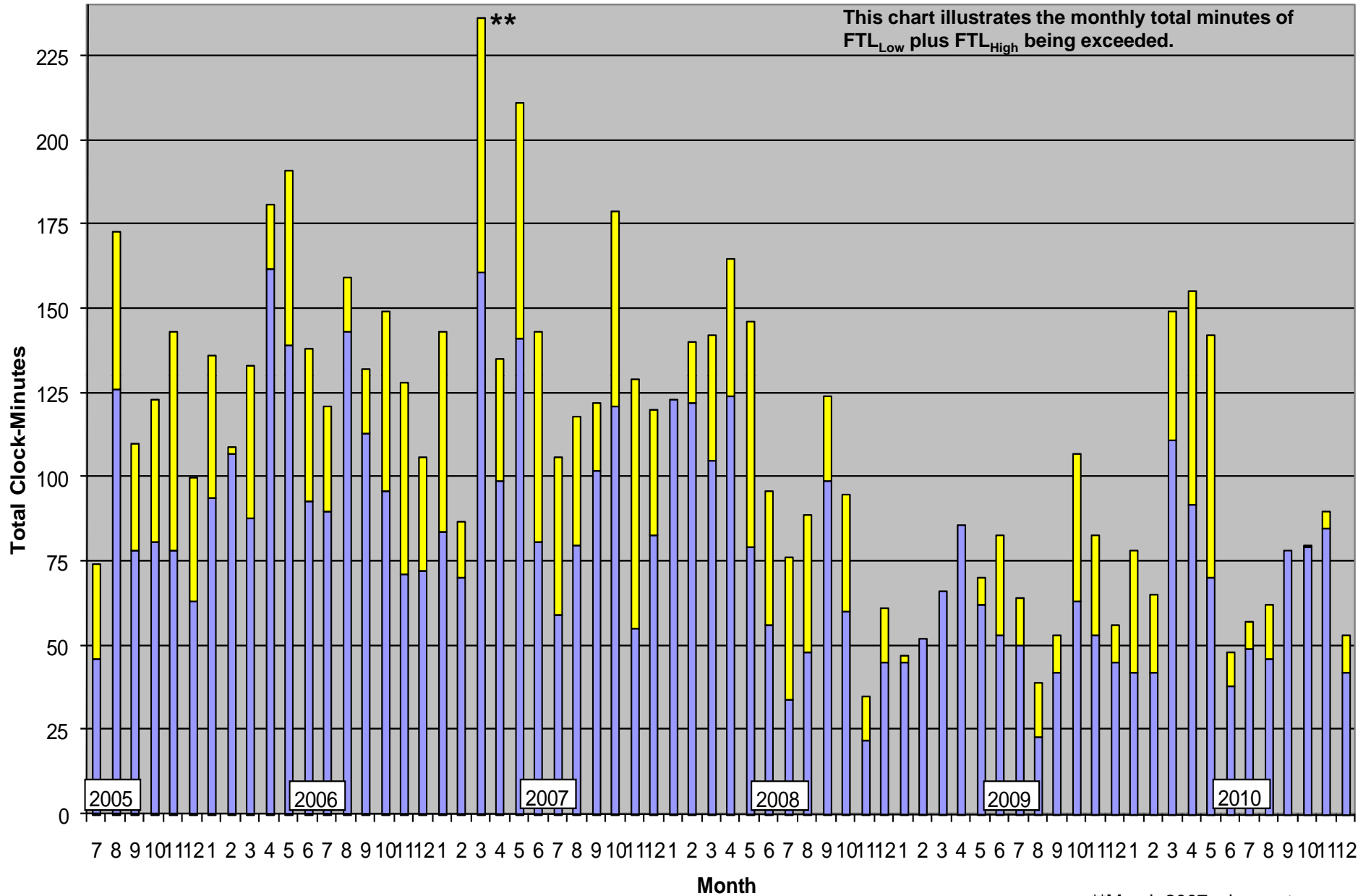
Eastern Interconnection



\*\*March 2007- change to the new Daylight Saving Time.

# Total Clock-Minutes less than 59.95 Hz or greater than 60.05 Hz

Eastern Interconnection



■ Total Minutes at 60 Hz
 ■ Addition Minutes During Time-Error Corrections

\*\*March 2007- change to the new Daylight Saving Time.

DateTime	TimeZone	FreqError	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	ACPS1
12/6/10 16:17	CST	-0.0143	59.9857	60	11	0	-1206.06
12/6/10 16:18	CST	-0.0237	59.9763	60	12	0	-2246.89
12/6/10 16:19	CST	-0.0339	59.9661	60	13	0	-3482.74
12/6/10 16:20	CST	-0.0380	59.9620	60	14	0	-3800.76
12/6/10 16:21	CST	-0.0275	59.9725	60	15	0	-2505.24
12/6/10 16:22	CST	-0.0196	59.9804	60	16	0	-1684.65
12/6/10 16:23	CST	-0.0212	59.9788	60	17	0	-1655.97
12/6/10 17:20	EST	-0.0343	59.9657	60	11	0	-2920.32
12/6/10 17:21	EST	-0.0373	59.9627	60	12	0	-3524.48
12/6/10 17:22	EST	-0.0261	59.9739	60	13	0	-2706.87
12/6/10 17:23	EST	-0.0209	59.9791	60	14	0	-2020.22
12/6/10 17:24	EST	-0.0196	59.9804	60	15	0	-2035.61
12/6/10 17:25	EST	-0.0078	59.9922	60	16	0	-747.374
12/8/10 3:48	CST	0.0337	60.0337	60	0	11	-4290.76
12/8/10 3:49	CST	0.0296	60.0296	60	0	12	-3493.71
12/8/10 3:50	CST	0.0176	60.0176	60	0	13	-1888.29
12/8/10 3:51	CST	0.0124	60.0124	60	0	14	-1174.94
12/8/10 3:52	CST	0.0179	60.0179	60	0	15	-1922.51
12/8/10 3:53	CST	0.0240	60.0240	60	0	16	-2635.92
12/8/10 3:54	CST	0.0182	60.0182	60	0	17	-2100.28
12/8/10 3:55	CST	0.0129	60.0129	60	0	18	-1227.16
12/8/10 3:56	CST	0.0113	60.0113	60	0	19	-1009.45
12/8/10 3:57	CST	0.0081	60.0081	60	0	20	-760.82
12/8/10 3:58	CST	0.0075	60.0075	60	0	21	-664.646
12/30/10 17:16	EST	-0.0224	59.9577	59.98	11	0	-1553.24
12/30/10 17:17	EST	-0.0220	59.9580	59.98	12	0	-1694.16
12/30/10 17:18	EST	-0.0231	59.9569	59.98	13	0	-2292.09
12/30/10 17:19	EST	-0.0260	59.9540	59.98	14	0	-3840.15
12/30/10 17:20	EST	-0.0101	59.9700	59.98	15	0	-2015.95
12/30/10 17:21	EST	0.0066	59.9866	59.98	16	0	-790.407

All durations of the BAAL being exceeded for more than 15 consecutive clock-minutes noted on left.

Periods of the FTL being exceeded for 3 consecutive clock minutes or more:

PrevailingTime	PTimeZone	FreqError	ActualFreq	SchedFreq
12/9/10 16:59	EST	0.0558	60.0558	60
12/9/10 17:00	EST	0.0678	60.0678	60
12/9/10 17:01	EST	0.0619	60.0619	60
12/10/10 5:54	EST	0.0575	60.0575	60
12/10/10 5:55	EST	0.0631	60.0631	60
12/10/10 5:56	EST	0.0507	60.0507	60
12/10/10 5:57	EST	0.0607	60.0607	60
12/10/10 5:58	EST	0.052	60.052	60
12/14/10 7:25	EST	0.0599	60.0599	60
12/14/10 7:26	EST	0.0597	60.0597	60
12/14/10 7:27	EST	0.0536	60.0536	60
12/14/10 18:01	EST	0.054	60.054	60
12/14/10 18:02	EST	0.0596	60.0596	60
12/14/10 18:03	EST	0.0582	60.0582	60
12/14/10 18:04	EST	0.0555	60.0555	60

DateTime	TimeZone	FreqError	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	ACPS 1
12/6/10 16:17	CST	-0.0143	59.9857	60	11	0	-1206.06
12/6/10 16:18	CST	0.0037	59.9763	60	12	0	2215.00
12/6/10 16:19	CS						
12/6/10 16:20	CS						
12/6/10 16:21	CS						
12/6/10 16:22	CS						
12/6/10 16:23	CS						
12/6/10 17:20	ES						
12/6/10 17:21	ES						
12/6/10 17:22	ES						
12/6/10 17:23	ES						
12/6/10 17:24	ES						
12/6/10 17:25	ES						
12/8/10 3:48	CS						
12/8/10 3:49	CS						
12/8/10 3:50	CS						
12/8/10 3:51	CS						
12/8/10 3:52	CS						
12/8/10 3:53	CS						
12/8/10 3:54	CS						
12/8/10 3:55	CS						
12/8/10 3:56	CS						
12/8/10 3:57	CS						
12/8/10 3:58	CS						
12/30/10 17:16	ES						
12/30/10 17:17	ES						
12/30/10 17:18	ES						
12/30/10 17:19	ES						
12/30/10 17:20	ES						
12/30/10 17:21	ES						

All durations of the BAAL being exceeded for more than 15 consecutive

Dates in this presentation:

Clock-minute Frequency greater than the  $FTL_{High}$  on December 10, 2010, ending 5:58 EST: 5 consecutive clock-minutes

Clock-minute ACE less than the  $BAAL_{Low}$  on December 6, 2010, ending 17:23 EST: 17 consecutive clock-minutes

Clock-minute ACE greater than the  $BAAL_{High}$  on December 8, 2010, ending 4:58 EST: 21 consecutive clock-minutes

Clock-minute ACE less than the  $BAAL_{Low}$  on December 30, 2010, ending 17:21 EST: 16 consecutive clock-minutes during time-error correction.

Under the draft requirement, a proposed  $BAAL_{Low}$  violation would occur when the ACE is lower than  $BAAL_{Low}$  for more than 30 consecutive clock-minutes and a proposed  $BAAL_{High}$  violation would occur when the ACE is greater than  $BAAL_{High}$  for more than 30 consecutive clock-minutes.

Under prior work on draft BAL-008, a proposed  $FTL_{Low}$  violation would occur when the Frequency is lower than  $FTL_{Low}$  for more than 30 consecutive clock-minutes and a proposed  $FTL_{High}$  violation would occur when the Frequency is greater than  $FTL_{High}$  for more than 30 consecutive clock-minutes.

eeded for or more:

eq	SchedFreq
58	60
78	60
19	60
75	60
31	60
07	60
07	60
52	60
99	60
97	60
36	60
12/14/10 18:01	EST 0.054 60.054 60
12/14/10 18:02	EST 0.0596 60.0596 60
12/14/10 18:03	EST 0.0582 60.0582 60
12/14/10 18:04	EST 0.0555 60.0555 60

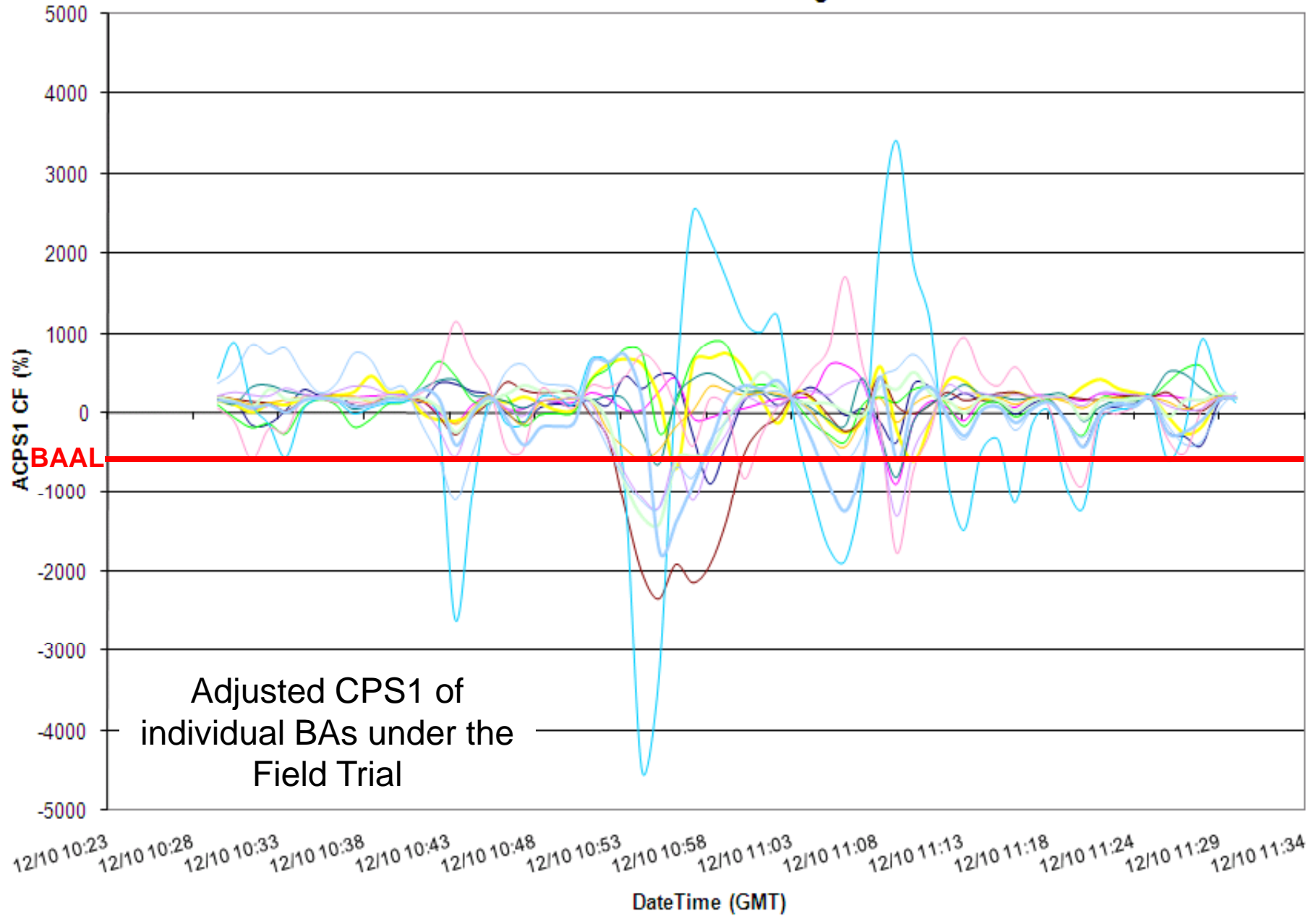
12/10/2010 ending 5:58 EST  
5-minute duration above  $FTL_{High}$

### El Clock-Minute Average Frequency



12/10/2010 ending 5:58 EST  
5-minute duration above  $FTL_{High}$

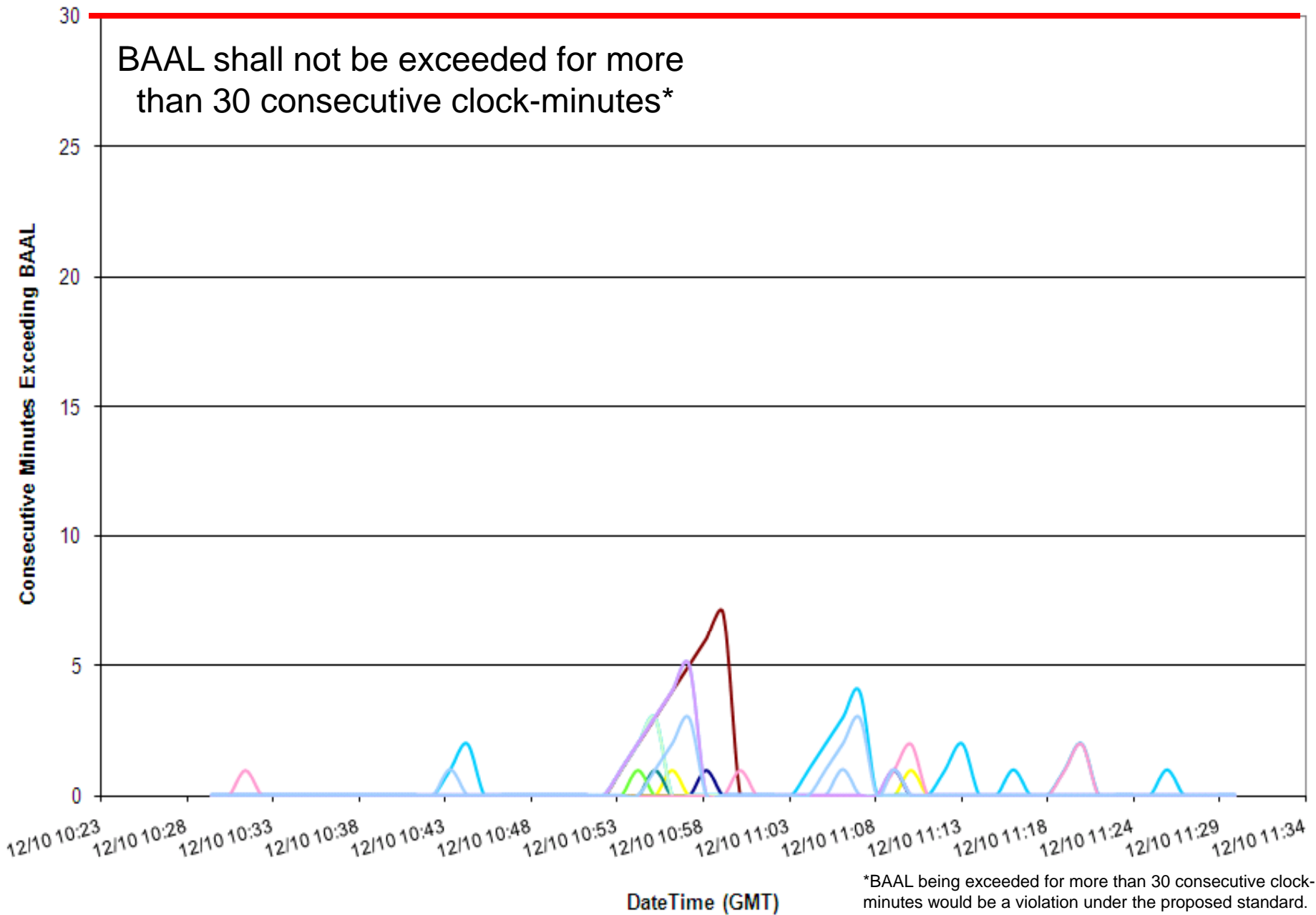
### ACPS1 Clock-Minute Averages



12/10/2010 ending 5:58 EST  
5-minute duration above FTL<sub>High</sub>

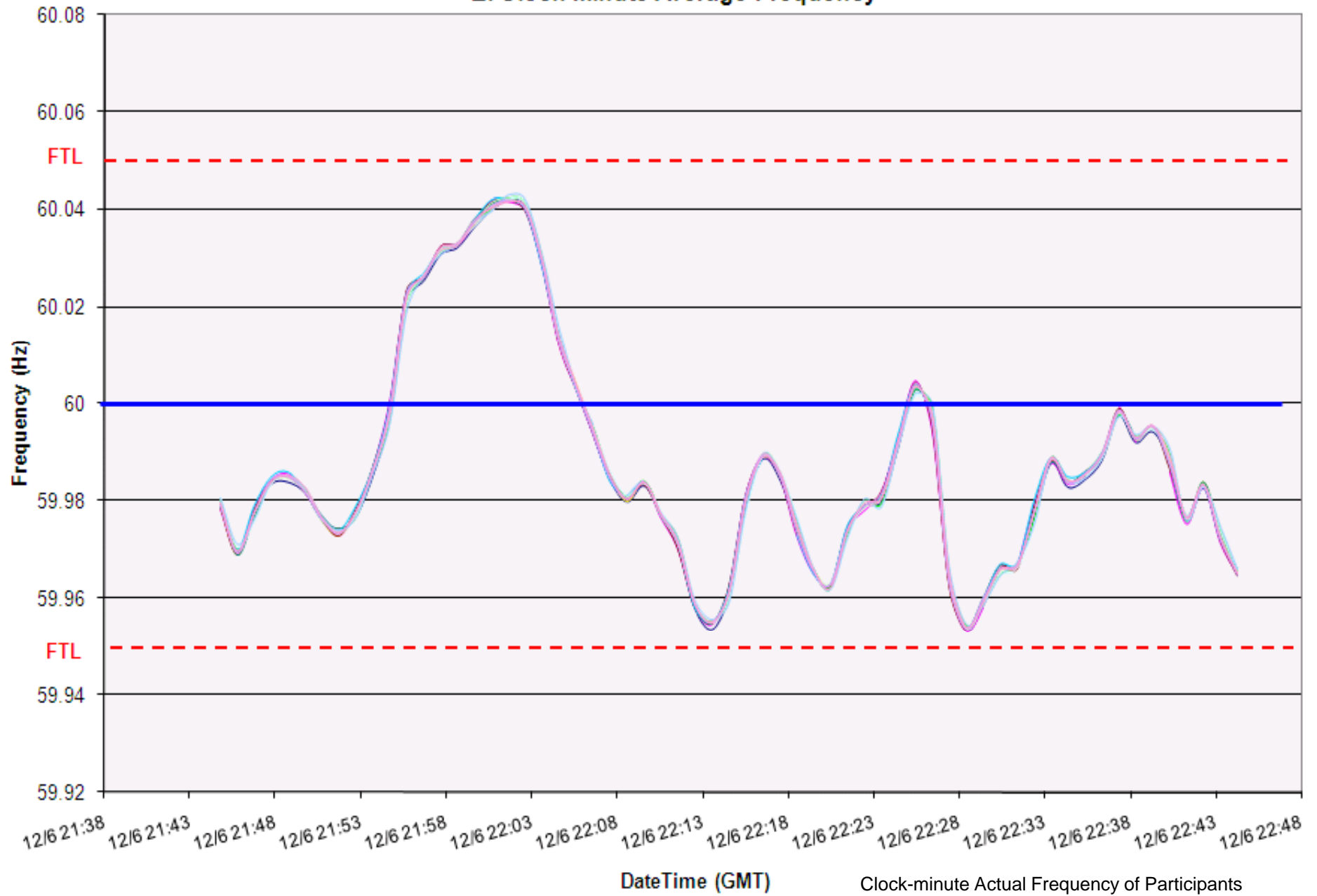
### Consecutive Minutes Exceeding BAAL

**BAAL Violation\***



12/06/2010 ending 17:23 EST  
17-minute duration above BAAL<sub>Low</sub>

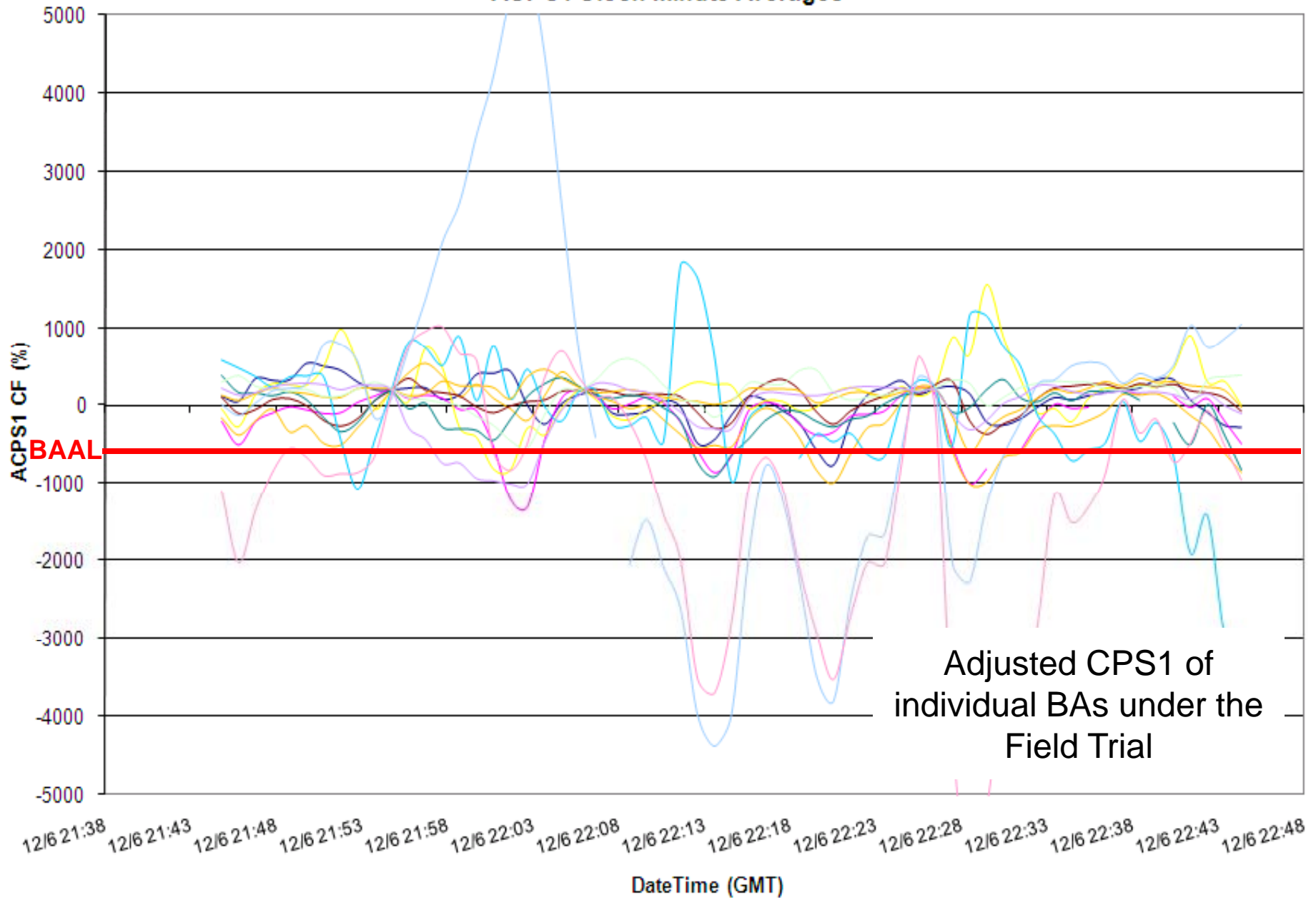
### El Clock-Minute Average Frequency



Clock-minute Actual Frequency of Participants

12/06/2010 ending 17:23 EST  
17-minute duration above BAAL<sub>Low</sub>

### ACPS1 Clock-Minute Averages



12/06/2010 ending 17:23 EST  
17-minute duration above BAAL<sub>Low</sub>

### Consecutive Minutes Exceeding BAAL

**BAAL Violation\***



12/08/2010 ending 4:58 EST  
21-minute duration above BAAL<sub>High</sub>

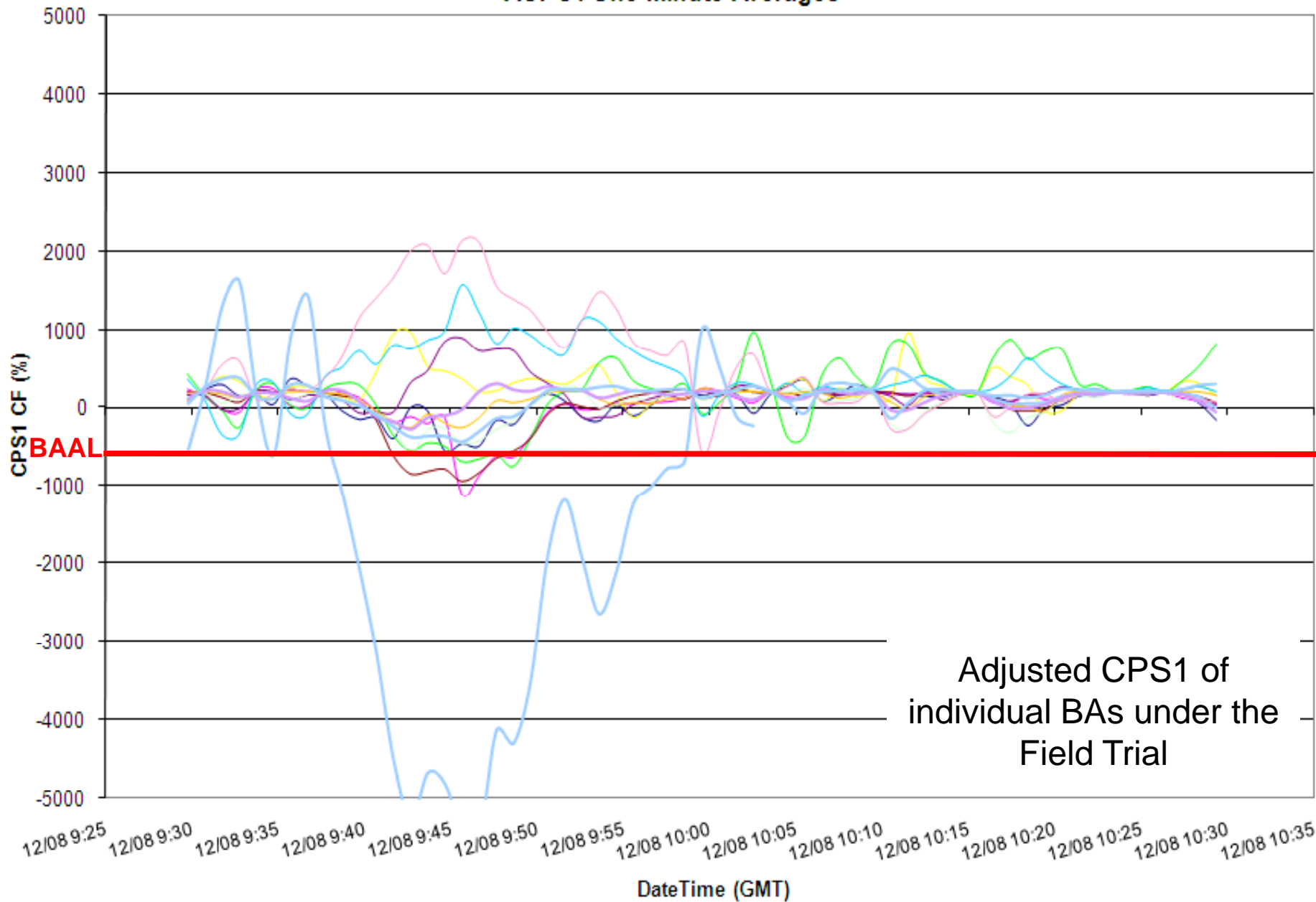
### EI Clock-Minute Average Frequency



Clock-minute Actual Frequency of Participants

12/08/2010 ending 4:58 EST  
21-minute duration above BAAL<sub>High</sub>

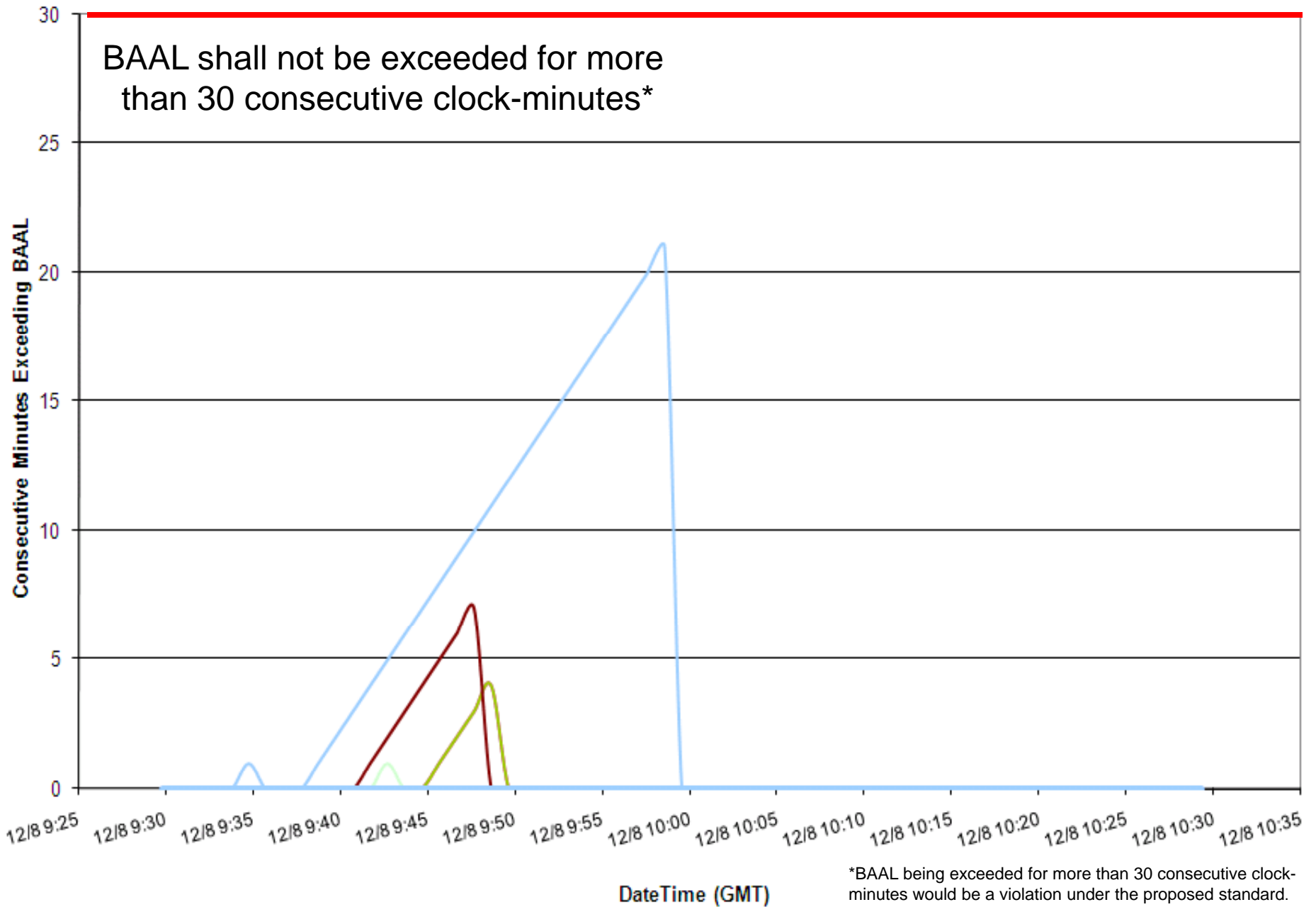
### ACPS1 One-Minute Averages



12/08/2010 ending 4:58 EST  
21-minute duration above BAAL<sub>High</sub>

### Consecutive Minutes Exceeding BAAL

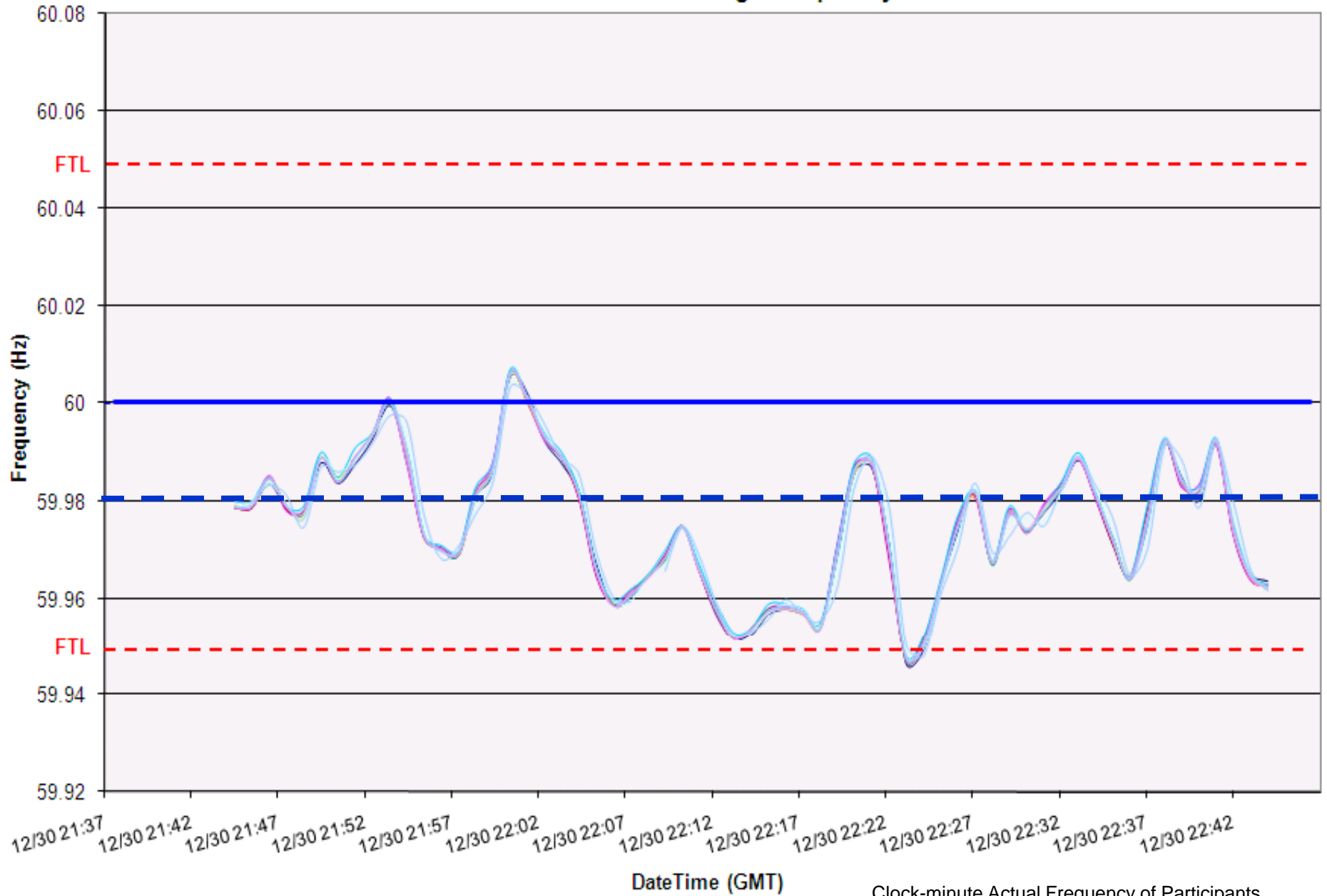
**BAAL Violation\***



\*BAAL being exceeded for more than 30 consecutive clock-minutes would be a violation under the proposed standard.

12/30/2010 ending 17:21 EST  
16-minute duration below BAAL<sub>Low</sub>

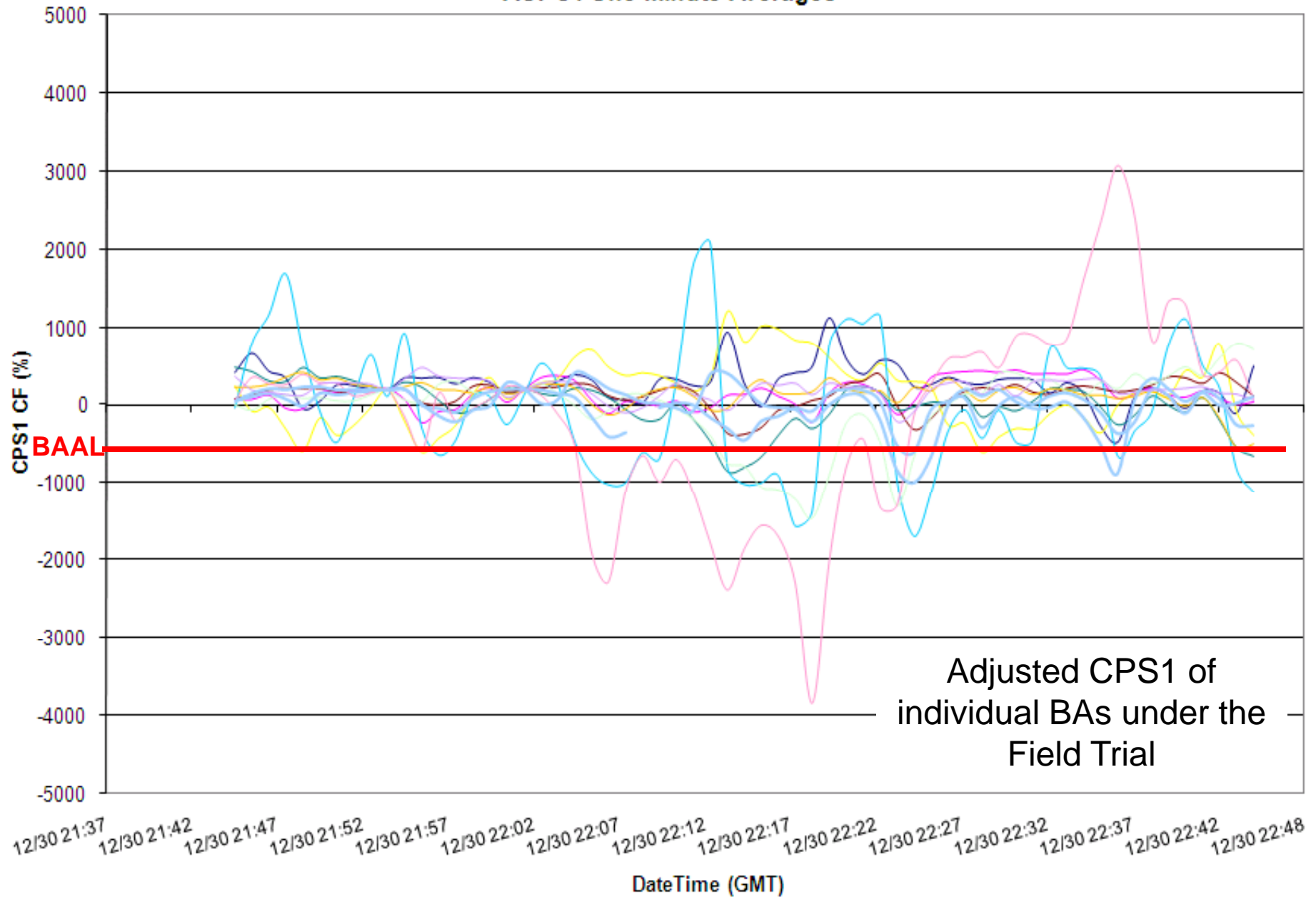
### EI Clock-Minute Average Frequency



Clock-minute Actual Frequency of Participants

12/30/2010 ending 17:21 EST  
16-minute duration below BAAL<sub>Low</sub>

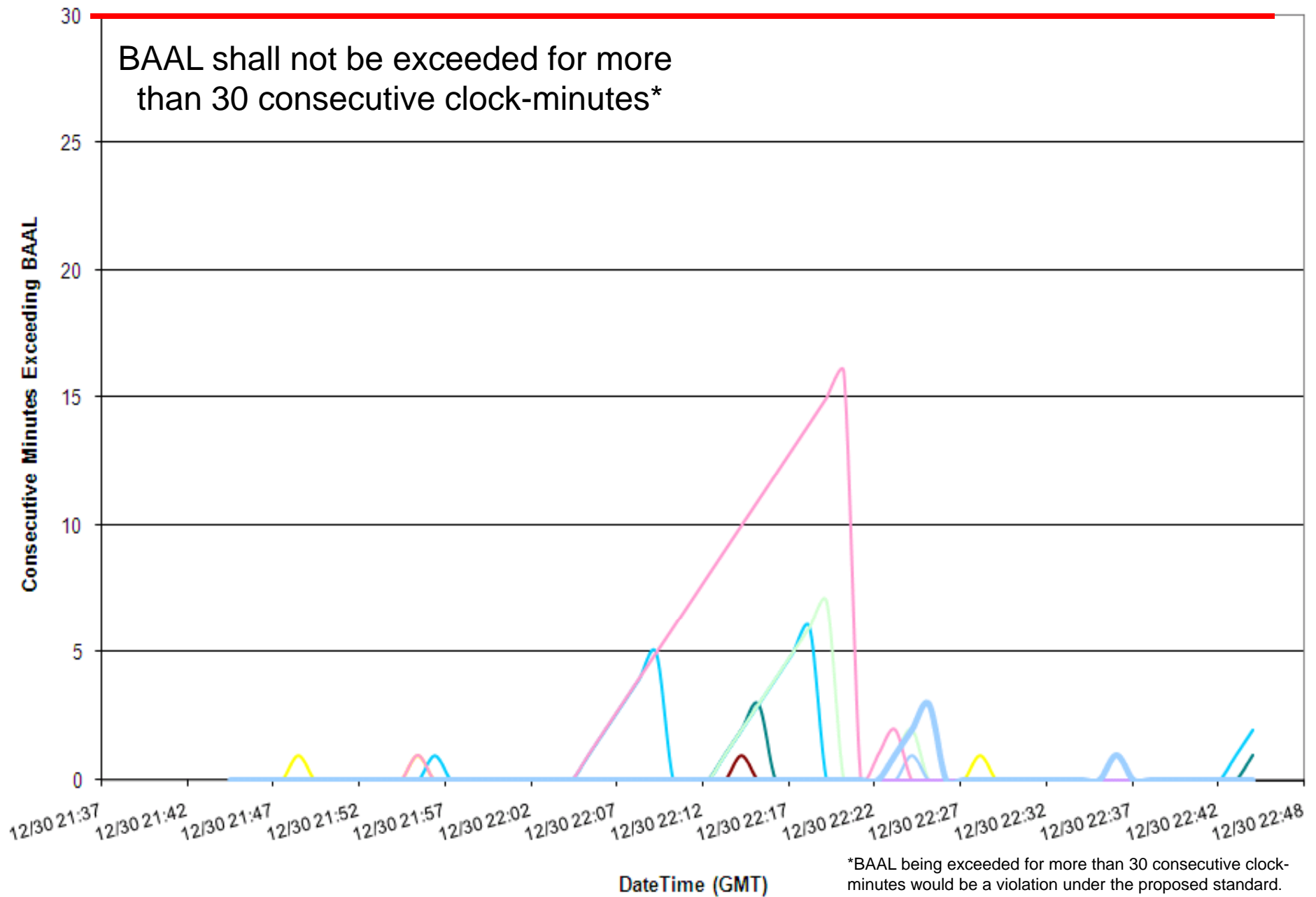
### ACPS1 One-Minute Averages



12/30/2010 ending 17:21 EST  
16-minute duration below BAAL<sub>Low</sub>

### Consecutive Minutes Exceeding BAAL

**BAAL Violation\***



# Balancing Authority ACE Limit Proof-of-Concept Field Trial

Examples of circumstances when BAAL was exceeded and actions taken if appropriate

Clock-minute of ACE exceeding the BAAL (mm/dd/yy hh:mm)	Clock-minute of ACE returning within the BAAL (mm/dd/yy hh:mm)	TimeZone	Total duration of ACE exceeding the BAAL (minutes)	Event associated with a DCS-Reportable Event? (0=No, 1=Yes)	Event associated with a resource loss other than a DCS-Reportable Event? (0=No, 1=Yes)	Brief explanation of circumstances and notable actions taken if applicable
12/6/10 22:36	12/6/10 22:50	EST	0:14	0	0	BAAL High Event. An industrial customer dropped load. Frequency was high. The operator attempted to resolve the situation by cutting generation.
12/8/10 3:38	12/8/10 3:59	CST	0:21	0	0	ACE was positive and a sale was scheduled at the top of the hour. Rather than move coal units down to reduce ACE and then immediately raise them to meet the schedule, the units were left towards the top.
12/9/10 6:02	12/9/10 6:16	EST	0:14	0	0	BAAL-low event. Generation wasn't able to keep up with climbing load toward the morning peak. Operator increased generation on quick-start CT units to return ACE to acceptable levels.
12/28/10 6:05	12/28/10 6:17	EST	0:12	0	0	High ACE was a result of primary demand running lighter than forecast. Generation dispatched down to control ACE.

# **Balancing Authority ACE Limit Proof-of-Concept Field Trial**

## Discussion

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