

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

WECC Update Discussion
February 4, 2011

DISCUSSION STARTING AT 3:30 PM EST

Doug Hils – Duke Energy

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

Balancing Authority ACE Limit Proof-of-Concept Field Trial

Western Interconnection Field Trial Participation

Western Interconnection Balancing Authority Participants	2010 Frequency Bias	WECC Region	Reliability Coordinator	Start Date
Alberta Electric System Operator (AESO)	-125	NWPP	WECC	March 1, 2010
Arizona Public Service Company (AZPS)	-74.5	AZNMSNV	WECC	March 1, 2010
Bonneville Power Administration (BPAT)	-157.3	NWPP	WECC	March 1, 2010
British Columbia Transmission Corporation (BCTC)	-118	NWPP	WECC	April 1, 2010
California Independent System Operator (CISO)	-485	CAMX	WECC	March 1, 2010
El Paso Electric Company (EPE)	-19	AZNMSNV	WECC	March 1, 2010
NaturEner Power Watch , LLC(GWA)	-2.1	NWPP	WECC	March 1, 2010
Idaho Power Company (IPCO)	-40	NWPP	WECC	March 1, 2010
Los Angeles Department of Water and Power (LDWP)	-62.3	CAMX	WECC	March 1, 2010
Nevada Power Company (NEVP)	-62.29	AZNMSNV	WECC	March 1, 2010
PacifiCorp East (PACE)	-77	NWPP	WECC	March 1, 2010
PacifiCorp West (PACW)	-45	NWPP	WECC	March 1, 2010
Portland General Electric (PGE)	-50	NWPP	WECC	April 1, 2010
Public Service Company of Colorado (PSCO)	-80	RMPA	WECC	March 1, 2010
Public Utility District No.1 of Chelan County(CHPD)	-12	NWPP	WECC	March 1, 2010
Public Utility District No.1 of Douglas County (DOPD)	-7	NWPP	WECC	April 1, 2010
Public Utility District No.2 of Grant County (GCPD)	-25	NWPP	WECC	March 1, 2010
Seattle City Light (SCL)	-40	NWPP	WECC	March 1, 2010
Sacramento Municipal Utility District (SMUD)	-45.18	NWPP	WECC	March 1, 2010
Salt River Project (SRP)	-65.2	AZNMSNV	WECC	May 1, 2010
Sierra Pacific Power Company (SPPC)	-20.04	NWPP	WECC	March 1, 2010
Tucson Electric Power (TEPC)	-30.4	AZNMSNV	WECC	March 1, 2010
Turlock Irrigation District (TIDC)	-6.7	NWPP	WECC	March 1, 2010
Western Area Power Administration – Rocky Mountain Region (WACM)	-55	RMPA	WECC	March 1, 2010
Western Area Power Administration- Desert Southwest Region (WALC)	-54.8	AZNMSNV	WECC	March 1, 2010

Clock-Minute Frequency Below 59.932 Hz FTL_{Low} or Above 60.068 Hz FTL_{High}

PrevailingTime	PTimeZone	FreqError	ActualFreq	SchedFreq
12/10/10 5:42	PST	-0.0739	59.9261	60.00
12/30/10 8:07	PST	-0.1243	59.8757	60.00
12/30/10 8:08	PST	-0.1040	59.8960	60.00
12/30/10 8:09	PST	-0.1005	59.8995	60.00
12/30/10 8:10	PST	-0.0845	59.9155	60.00
12/30/10 8:11	PST	-0.0776	59.9224	60.00
PrevailingTime	PTimeZone	FreqError	ActualFreq	SchedFreq
12/17/10 5:56	PST	0.0720	60.0720	60.00
12/17/10 5:57	PST	0.0726	60.0726	60.00
12/17/10 5:58	PST	0.0682	60.0682	60.00

12/10/2010 – coincident imbalance

12/30/2010 - Total loss of 1600 MW.

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*

BA Number	Performance Since Entering the Field Trial				Current Month Statistics														
	BAAL _{Low}		BAAL _{High}		ATL _{Low}		ATL _{High}		BAAL _{Low} or ATL _{Low}		BAAL _{High} or ATL _{High}								
	Max	MinCtLow	Max	MinCtHigh	Max	MinCtLow2	Max	MinCtHigh2	Max	LowLimitCt	Max	HighLimitCt							
BA05	44		42		58		49		27		31		33		35		38		35
BA06	16		15		13		15		16		8		7		4		16		8
BA07	23		36		29		41		23		36		18		29		23		36
BA08	22		41		19		34		20		41		6		2		20		41
BA09	11		9		15		55		1		8		3		5		3		8
BA11	10		14		16		7		6		7		0		0		6		7
BA12	10		13		14		17		7		13		2		13		7		13
BA13	7		27		12		45		7		6		1		1		7		6
BA14	23		31		13		55		23		5		13		1		23		5
BA15	5		7		7		5		1		0		0		0		1		0
BA16	14		14		25		34		3		14		3		11		3		14
BA18	7		13		25		15		2		2		2		0		2		2
BA19	11		16		30		34		1		1		1		1		31		17
BA22	5		10		15		14		5		10		1		1		5		13
BA23	20		18		13		27		20		2		1		1		20		2
BA25	15		22		21		14		11		22		2		1		11		22
BA26	13		23		43		41		11		15		14		18		14		18
BA27	23		22		16		15		1		0		0		4		1		4
BA28	13		24		38		39		7		24		8		29		8		29
BA29	17		9		16		16		3		6		5		2		5		6
BA30	19		18		47		39		11		1		6		2		11		2
BA31	20		16		29		28		13		12		12		3		13		12
BA33	26		13		28		58		10		7		9		15		10		15
BA34	16		17		23		29		14		17		14		19		14		19
BA36	69		16		114		25		10		12		9		14		10		14

MinCtLow = Count of consecutive clock-minutes BAAL_{Low} was exceeded
 MinCtHigh = Count of consecutive clock-minutes BAAL_{High} was exceeded
 MinCtLow2 = Count of consecutive clock-minutes ATL_{Low} was exceeded
 MinCtHigh2 = Count of consecutive clock-minutes ATL_{High} was exceeded

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

Statistics of BAAL being exceeded > 20 consecutive clock-minutes :

Date	Time	TimeZone	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	CPS1	ACPS1	MinCtLow2	MinCtHigh2	LowLimitCt	HighLimitCt
12/03/10	17:41	MST	59.960	60.00	21	0	-5218.14	-5218.14	0	0	21	0
12/03/10	17:42	MST	59.963	60.00	22	0	-4097.79	-4097.79	0	0	22	0
12/03/10	17:43	MST	59.962	60.00	23	0	-3581.61	-3581.61	0	0	23	0
12/03/10	17:44	MST	59.967	60.00	24	0	-2535.56	-2535.56	0	0	24	0
12/03/10	17:45	MST	59.961	60.00	25	0	-1947.90	-1947.90	0	0	25	0
12/03/10	17:46	MST	59.957	60.00	26	0	-1196.48	-1196.48	0	0	26	0
12/07/10	22:01	MST	60.020	60.02	0	21	187.67	-2278.29	0	0	0	21
12/07/10	22:02	MST	60.022	60.02	0	22	-35.35	-2388.82	0	0	0	22
12/07/10	22:03	MST	60.028	60.02	0	23	-730.89	-3087.57	0	0	0	23
12/07/10	22:04	MST	60.028	60.02	0	24	-640.60	-2882.18	0	0	0	24
12/07/10	22:05	MST	60.020	60.02	0	25	170.81	-1775.27	0	0	0	25
12/07/10	22:06	MST	60.023	60.02	0	26	-55.00	-1943.90	0	0	0	26
12/07/10	22:07	MST	60.020	60.02	0	27	213.76	-1161.78	0	0	0	27
12/09/10	12:06	MST	60.019	60.00	0	21	-3039.57	-3039.57	0	0	0	21
12/09/10	12:07	MST	60.020	60.00	0	22	-3021.78	-3021.78	0	0	0	22
12/09/10	12:08	MST	60.014	60.00	0	23	-1491.23	-1491.23	0	0	0	23
12/09/10	12:09	MST	60.015	60.00	0	24	-1593.64	-1593.64	0	0	0	24
12/09/10	12:10	MST	60.019	60.00	0	25	-2118.24	-2118.24	0	0	0	25
12/09/10	12:11	MST	60.010	60.00	0	26	-1059.35	-1059.35	0	0	0	26
12/09/10	12:12	MST	60.015	60.00	0	27	-1756.35	-1756.35	0	0	0	27
12/14/10	7:33	MST	59.948	60.00	21	0	-8013.83	-8013.83	0	0	21	0
12/14/10	7:34	MST	59.948	60.00	22	0	-8066.48	-8066.48	0	0	22	0
12/14/10	7:35	MST	59.956	60.00	23	0	-7271.35	-7271.35	0	0	23	0
12/14/10	7:36	MST	59.959	60.00	24	0	-7079.57	-7079.57	0	0	24	0
12/14/10	7:37	MST	59.957	60.00	25	0	-6506.14	-6506.14	0	0	25	0
12/14/10	7:38	MST	59.964	60.00	26	0	-1844.95	-1844.95	0	0	26	0
12/14/10	7:39	MST	59.967	60.00	27	0	-2206.75	-2206.75	0	0	27	0
12/15/10	18:31	MST	59.981	60.00	21	0	-11898.48	-11898.48	15	0	21	0
12/15/10	18:32	MST	59.986	60.00	22	0	-7325.89	-7325.89	16	0	22	0
12/15/10	18:33	MST	59.987	60.00	23	0	-5847.81	-5847.81	17	0	23	0
12/15/10	18:34	MST	59.984	60.00	24	0	-7018.22	-7018.22	18	0	24	0
12/15/10	18:35	MST	59.989	60.00	25	0	-4978.85	-4978.85	19	0	25	0
12/15/10	18:36	MST	59.988	60.00	26	0	-5548.76	-5548.76	20	0	26	0

Statistics of BAAL being exceeded > 20 consecutive clock-minutes :

Date	Time	TimeZone	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	CPS1	ACPS1	MinCtLow2	MinCtHigh2	LowLimitCt	HighLimitCt
12/18/10	12:41	MST	60.035	60.02	0	21	-283.81	-920.39	0	0	0	21
12/18/10	12:42	MST	60.041	60.02	0	22	-505.15	-1179.94	0	0	0	22
12/18/10	12:43	MST	60.039	60.02	0	23	-512.25	-1258.07	0	0	0	23
12/18/10	12:44	MST	60.037	60.02	0	24	-403.31	-1117.28	0	0	0	24
12/18/10	12:45	MST	60.041	60.02	0	25	-591.32	-1348.57	0	0	0	25
12/18/10	12:46	MST	60.043	60.02	0	26	-654.37	-1403.81	0	0	0	26
12/18/10	12:47	MST	60.040	60.02	0	27	-510.84	-1228.87	0	0	0	27
12/18/10	12:48	MST	60.037	60.02	0	28	-383.81	-1054.86	0	0	0	28
12/18/10	12:49	MST	60.031	60.02	0	29	-162.69	-798.98	0	0	0	29
12/18/10	13:50	MST	60.043	60.02	0	21	-1976.04	-3843.89	0	0	0	21
12/18/10	13:51	MST	60.043	60.02	0	22	-1928.32	-3812.87	0	0	0	22
12/18/10	13:52	MST	60.020	60.02	0	23	218.75	-1656.04	0	0	0	23
12/18/10	13:53	MST	60.012	60.02	0	24	892.35	-905.95	0	0	0	24
12/18/10	13:54	MST	60.020	60.02	0	25	218.56	-1637.02	0	0	0	25
12/18/10	13:55	MST	60.015	60.02	0	26	698.00	-1112.91	0	0	0	26
12/18/10	13:56	MST	60.013	60.02	0	27	847.81	-951.66	0	0	0	27
12/18/10	14:24	MST	60.036	60.02	0	21	-2047.86	-4857.68	0	0	0	21
12/18/10	14:25	MST	60.028	60.02	0	22	-929.22	-3717.42	0	0	0	22
12/18/10	14:26	MST	60.029	60.02	0	23	-1076.69	-3913.77	0	0	0	23
12/18/10	14:27	MST	60.034	60.02	0	24	-1715.62	-4589.06	0	0	0	24
12/18/10	14:28	MST	60.030	60.02	0	25	-1186.59	-4016.36	0	0	0	25
12/18/10	14:29	MST	60.039	60.02	0	26	-2581.52	-5494.10	0	0	0	26
12/18/10	14:30	MST	60.038	60.02	0	27	-2361.75	-5272.83	0	0	0	27
12/18/10	14:31	MST	60.039	60.02	0	28	-2587.43	-5506.20	0	0	0	28
12/18/10	14:32	MST	60.041	60.02	0	29	-2747.46	-5623.04	0	0	0	29
12/18/10	14:33	MST	60.031	60.02	0	30	-1361.23	-4199.83	0	0	0	30
12/18/10	14:34	MST	60.045	60.02	0	31	-2785.97	-5223.50	0	0	0	31
12/29/10	9:27	MST	59.985	60.00	21	0	-3891.95	-3891.95	0	0	21	0
12/29/10	9:28	MST	59.977	60.00	22	0	-5984.46	-5984.46	0	0	22	0
12/29/10	9:29	MST	59.982	60.00	23	0	-4593.02	-4593.02	0	0	23	0
12/29/10	9:30	MST	59.983	60.00	24	0	-4311.45	-4311.45	0	0	24	0
12/29/10	9:31	MST	59.983	60.00	25	0	-3792.57	-3792.57	0	0	25	0
12/29/10	9:32	MST	59.976	60.00	26	0	-1849.22	-1849.22	0	0	26	0

Statistics of BAAL being exceeded > 20 consecutive clock-minutes :

Date	Time	TimeZone	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	CPS1	ACPS1	MinCtLow2	MinCtHigh2	LowLimitCt	HighLimitCt
12/10/10	0:20	MST	60.026	60.00	0	21	-2480.90	-2480.90	0	21	0	21
12/10/10	0:21	MST	60.025	60.00	0	22	-2414.25	-2414.25	0	22	0	22
12/10/10	0:22	MST	60.039	60.00	0	23	-3726.38	-3726.38	0	23	0	23
12/10/10	0:23	MST	60.041	60.00	0	24	-3956.13	-3956.13	0	24	0	24
12/10/10	0:24	MST	60.039	60.00	0	25	-3572.90	-3572.90	0	25	0	25
12/10/10	0:25	MST	60.030	60.00	0	26	-2563.52	-2563.52	0	26	0	26
12/10/10	0:26	MST	60.020	60.00	0	27	-1533.46	-1533.46	0	27	0	27
12/10/10	0:27	MST	60.033	60.00	0	28	-2488.29	-2488.29	0	28	0	28
12/10/10	0:28	MST	60.028	60.00	0	29	-2051.06	-2051.06	0	29	0	29
12/10/10	0:29	MST	60.030	60.00	0	30	-2052.11	-2052.11	0	0	0	30
12/10/10	0:30	MST	60.030	60.00	0	31	-2073.54	-2073.54	0	0	0	31
12/10/10	0:31	MST	60.038	60.00	0	32	-2549.07	-2549.07	0	0	0	32
12/10/10	0:32	MST	60.015	60.00	0	33	-842.57	-842.57	0	0	0	33
12/10/10	0:33	MST	60.017	60.00	0	34	-978.02	-978.02	0	0	0	34
12/10/10	0:34	MST	60.014	60.00	0	35	-722.30	-722.30	0	0	0	35
12/10/10	0:35	MST	60.020	60.00	0	36	-979.80	-979.80	0	0	0	36
12/21/10	22:59	PST	60.036	60.00	0	21	-1530.90	-1530.90	0	0	0	21
12/21/10	23:00	PST	60.038	60.00	0	22	-1745.54	-1745.54	0	0	0	22
12/21/10	23:01	PST	60.038	60.00	0	23	-1768.16	-1768.16	0	0	0	23
12/21/10	23:02	PST	60.036	60.00	0	24	-1582.05	-1582.05	0	0	0	24
12/21/10	23:03	PST	60.038	60.00	0	25	-1890.99	-1890.99	0	0	0	25
12/21/10	23:04	PST	60.041	60.00	0	26	-2044.59	-2044.59	0	0	0	26
12/21/10	23:05	PST	60.040	60.00	0	27	-2064.11	-2064.11	0	0	0	27
12/21/10	23:06	PST	60.039	60.00	0	28	-1942.87	-1942.87	0	0	0	28
12/21/10	23:07	PST	60.037	60.00	0	29	-1899.11	-1899.11	0	0	0	29
12/21/10	23:08	PST	60.030	60.00	0	30	-1591.35	-1591.35	0	0	0	30
12/21/10	23:09	PST	60.028	60.00	0	31	-1526.57	-1526.57	0	0	0	31
12/21/10	23:10	PST	60.024	60.00	0	32	-1355.32	-1355.32	0	0	0	32
12/21/10	23:11	PST	60.030	60.00	0	33	-1632.76	-1632.76	0	0	0	33
12/21/10	23:12	PST	60.032	60.00	0	34	-1826.55	-1826.55	0	0	0	34
12/21/10	23:13	PST	60.024	60.00	0	35	-1316.98	-1316.98	0	0	0	35
12/21/10	23:14	PST	60.045	60.00	0	36	-2877.57	-2877.57	0	0	0	36
12/21/10	23:15	PST	60.045	60.00	0	37	-2856.80	-2856.80	0	0	0	37
12/21/10	23:16	PST	60.043	60.00	0	38	-2778.12	-2778.12	0	0	0	38
12/21/10	23:17	PST	60.035	60.00	0	39	-2313.69	-2313.69	0	0	0	39
12/21/10	23:18	PST	60.036	60.00	0	40	-1808.94	-1808.94	0	0	0	40
12/21/10	23:19	PST	60.047	60.00	0	41	-885.38	-885.38	0	0	0	41

Statistics of ATL (4 x L₁₀) being exceeded > 20 consecutive clock-minutes :

Date	Time	TimeZone	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	CPS1	ACPS1	MinCtLow2	MinCtHigh2	LowLimitCt	HighLimitCt
12/09/10	15:49	MST	60.003	60.00	0	0	2028.67	2028.67	21	0	21	0
12/09/10	15:50	MST	60.007	60.00	0	0	4717.08	4717.08	22	0	22	0
12/09/10	15:51	MST	60.003	60.00	0	0	1987.22	1987.22	23	0	23	0
12/09/10	15:52	MST	60.006	60.00	0	0	3743.62	3743.62	24	0	24	0
12/09/10	15:53	MST	60.012	60.00	0	0	4785.91	4785.91	25	0	25	0
12/09/10	15:54	MST	60.013	60.00	0	0	5078.70	5078.70	26	0	26	0
12/09/10	15:55	MST	60.019	60.00	0	0	6892.52	6892.52	27	0	27	0
12/10/10	3:38	MST	59.985	59.98	0	0	-2681.51	8618.53	0	21	0	21
12/10/10	3:39	MST	59.983	59.98	0	0	-1843.89	10178.99	0	22	0	22
12/10/10	3:40	MST	59.986	59.98	0	0	-3329.75	9055.34	0	23	0	23
12/10/10	3:41	MST	59.996	59.98	0	0	-9312.09	2431.23	0	24	0	24
12/10/10	3:42	MST	60.000	59.98	0	0	-10507.75	418.53	0	25	0	25
12/10/10	3:43	MST	59.996	59.98	0	0	-5091.02	1441.10	0	26	0	26
12/14/10	14:57	MST	60.013	60.00	0	0	5272.32	5272.32	21	0	26	0
12/14/10	14:58	MST	60.021	60.00	0	0	8091.81	8091.81	22	0	27	0
12/14/10	14:59	MST	60.021	60.00	0	0	8031.49	8031.49	23	0	28	0
12/14/10	15:00	MST	60.016	60.00	0	0	6050.45	6050.45	24	0	29	0
12/14/10	15:01	MST	60.019	60.00	0	0	6905.68	6905.68	25	0	30	0
12/14/10	15:02	MST	60.005	60.00	0	0	1799.85	1799.85	26	0	31	0
12/14/10	15:03	MST	60.014	60.00	0	0	4788.32	4788.32	27	0	32	0
12/14/10	15:04	MST	60.001	60.00	0	0	685.44	685.44	28	0	33	0
12/14/10	15:05	MST	60.005	60.00	0	0	1915.02	1915.02	29	0	34	0
12/14/10	15:06	MST	60.012	60.00	0	0	3797.35	3797.35	30	0	35	0
12/14/10	15:07	MST	60.003	60.00	0	0	1093.47	1093.47	31	0	36	0
12/14/10	15:08	MST	60.007	60.00	0	0	2632.28	2632.28	32	0	37	0
12/14/10	15:09	MST	60.005	60.00	0	0	2016.12	2016.12	33	0	38	0
12/27/10	23:30	MST	60.022	60.00	0	4	-8223.64	-8223.64	0	21	0	21
12/27/10	23:31	MST	60.016	60.00	0	5	-6315.72	-6315.72	0	22	0	22
12/27/10	23:32	MST	60.023	60.00	0	6	-9248.64	-9248.64	0	23	0	23
12/27/10	23:33	MST	60.017	60.00	0	7	-6645.69	-6645.69	0	24	0	24
12/27/10	23:34	MST	60.024	60.00	0	8	-9618.62	-9618.62	0	25	0	25
12/27/10	23:35	MST	60.026	60.00	0	9	-10209.11	-10209.11	0	26	0	26
12/27/10	23:36	MST	60.024	60.00	0	10	-9863.91	-9863.91	0	27	0	27
12/27/10	23:37	MST	60.013	60.00	0	11	-4818.85	-4818.85	0	28	0	28
12/27/10	23:38	MST	60.014	60.00	0	12	-5198.54	-5198.54	0	29	0	29
12/27/10	23:39	MST	60.016	60.00	0	13	-6441.41	-6441.41	0	30	0	30
12/27/10	23:40	MST	60.021	60.00	0	14	-8103.07	-8103.07	0	31	0	31
12/27/10	23:41	MST	60.021	60.00	0	15	-8233.71	-8233.71	0	32	0	32
12/27/10	23:42	MST	60.024	60.00	0	16	-9172.16	-9172.16	0	33	0	33
12/27/10	23:43	MST	60.023	60.00	0	17	-8676.32	-8676.32	0	34	0	34
12/27/10	23:44	MST	60.011	60.00	0	18	-3391.32	-3391.32	0	35	0	35

Statistics of ATL (4 x L₁₀) being exceeded > 20 consecutive clock-minutes :

Date	Time	TimeZone	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	CPS1	ACPS1	MinCtLow2	MinCtHigh2	LowLimitCt	HighLimitCt
12/10/10	0:20	MST	60.026	60.00	0	21	-2480.90	-2480.90	0	21	0	21
12/10/10	0:21	MST	60.025	60.00	0	22	-2414.25	-2414.25	0	22	0	22
12/10/10	0:22	MST	60.039	60.00	0	23	-3726.38	-3726.38	0	23	0	23
12/10/10	0:23	MST	60.041	60.00	0	24	-3956.13	-3956.13	0	24	0	24
12/10/10	0:24	MST	60.039	60.00	0	25	-3572.90	-3572.90	0	25	0	25
12/10/10	0:25	MST	60.030	60.00	0	26	-2563.52	-2563.52	0	26	0	26
12/10/10	0:26	MST	60.020	60.00	0	27	-1533.46	-1533.46	0	27	0	27
12/10/10	0:27	MST	60.033	60.00	0	28	-2488.29	-2488.29	0	28	0	28
12/10/10	0:28	MST	60.028	60.00	0	29	-2051.06	-2051.06	0	29	0	29
12/05/10	17:27	PST	60.037	60.00	0	11	-1001.17	-1001.17	0	21	0	21
12/05/10	17:28	PST	60.034	60.00	0	12	-810.62	-810.62	0	22	0	22
12/05/10	17:29	PST	60.025	60.00	0	0	-444.00	-444.00	0	23	0	23
12/05/10	17:30	PST	60.023	60.00	0	0	-347.57	-347.57	0	24	0	24
12/05/10	17:31	PST	60.017	60.00	0	0	-176.99	-176.99	0	25	0	25
12/05/10	17:32	PST	60.016	60.00	0	0	-149.29	-149.29	0	26	0	26
12/05/10	17:33	PST	60.012	60.00	0	0	-48.23	-48.23	0	27	0	27
12/05/10	17:34	PST	60.015	60.00	0	0	-86.80	-86.80	0	28	0	28
12/30/10	9:18	PST	60.030	60.00	0	18	-755.57	-755.57	0	21	0	21
12/30/10	9:19	PST	60.030	60.00	0	19	-838.73	-838.73	0	22	0	22
12/30/10	9:20	PST	60.033	60.00	0	20	-913.15	-913.15	0	23	0	23
12/30/10	9:21	PST	60.030	60.00	0	21	-777.61	-777.61	0	24	0	24
12/30/10	9:22	PST	60.036	60.00	0	22	-1022.52	-1022.52	0	25	0	25
12/30/10	9:23	PST	60.037	60.00	0	23	-1053.83	-1053.83	0	26	0	26
12/30/10	9:24	PST	60.030	60.00	0	24	-760.94	-760.94	0	27	0	27
12/30/10	9:25	PST	60.020	60.00	0	0	-365.81	-365.81	0	28	0	28
12/30/10	9:26	PST	60.012	60.00	0	0	-55.39	-55.39	0	29	0	29

12/30/2010 ending 9:11 MST
5 minute duration below FTL_{Low}

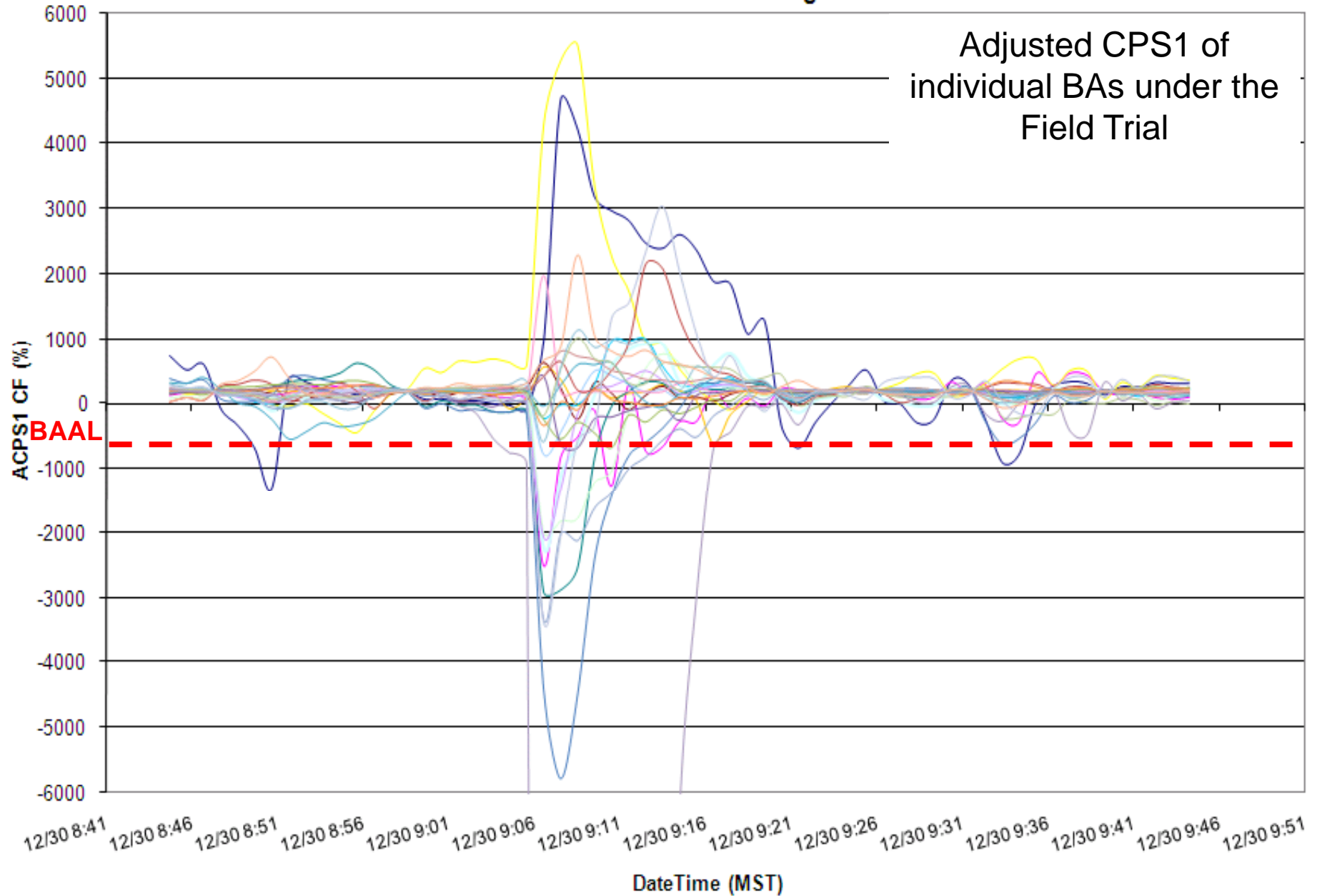
Clock-Minute Average Frequency



Clock-minute Actual Frequency of Participants

12/30/2010 ending 9:11 MST
5 minute duration below FTL_{Low}

ACPS1 Clock-Minute Averages



12/30/2010 ending 9:11 MST
5 minute duration below FTL_{Low}

Consecutive Minutes Exceeding BAAL

BAAL Violation*



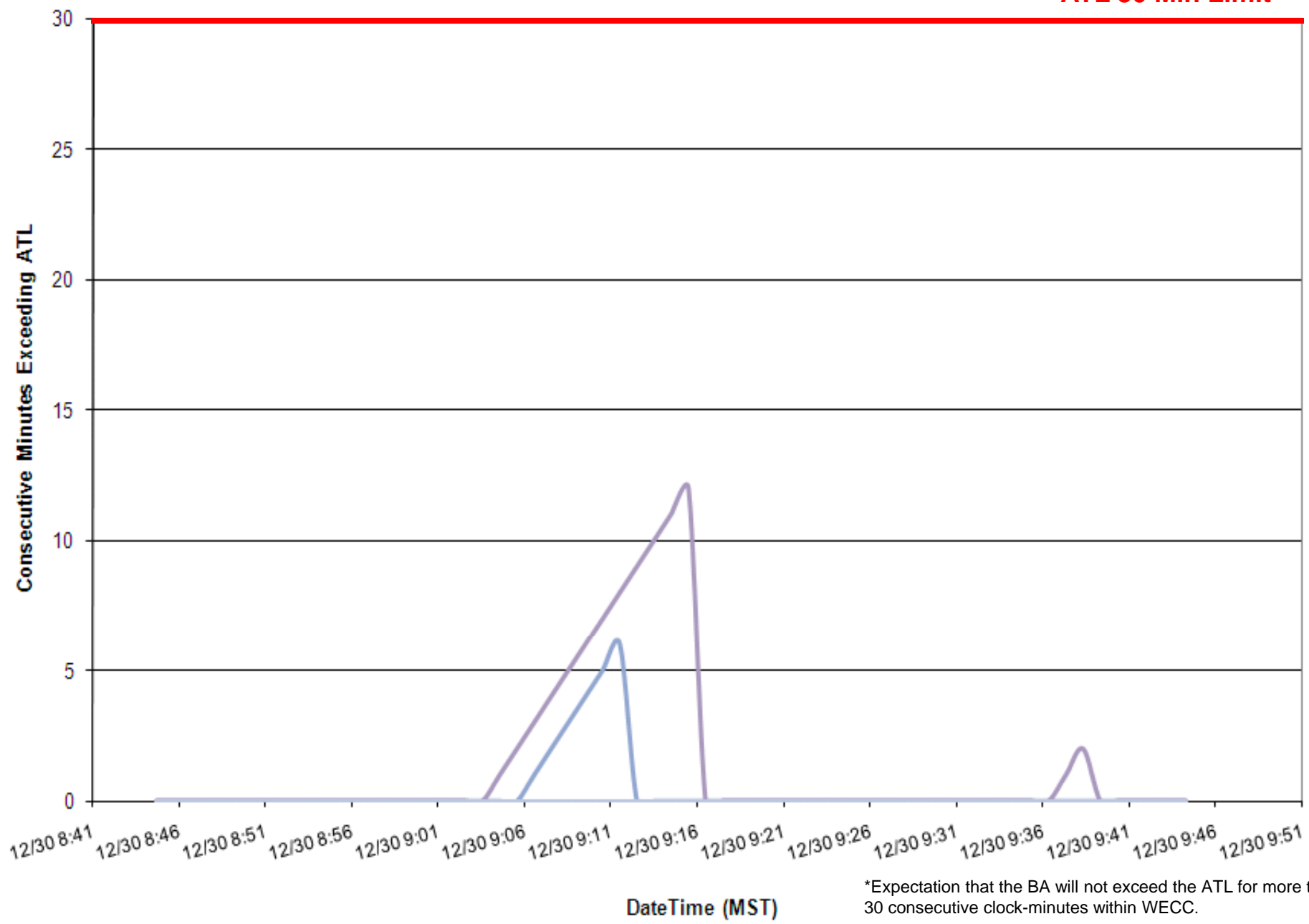
*BAAL being exceeded for more than 30 consecutive clock-minutes would be a violation under the proposed standard.

12/30/2010 ending 9:11 MST

5 minute duration below FTL_{Low}

Consecutive Minutes Exceeding ATL

ATL 30 Min Limit*



*Expectation that the BA will not exceed the ATL for more than 30 consecutive clock-minutes within WECC.

12/10/2010 ending 6:42 MST

60.02 Hz. Scheduled Frequency

1 minute duration below FTL_{Low}

60.02 Scheduled Frequency TEC.

Clock-Minute Average Frequency



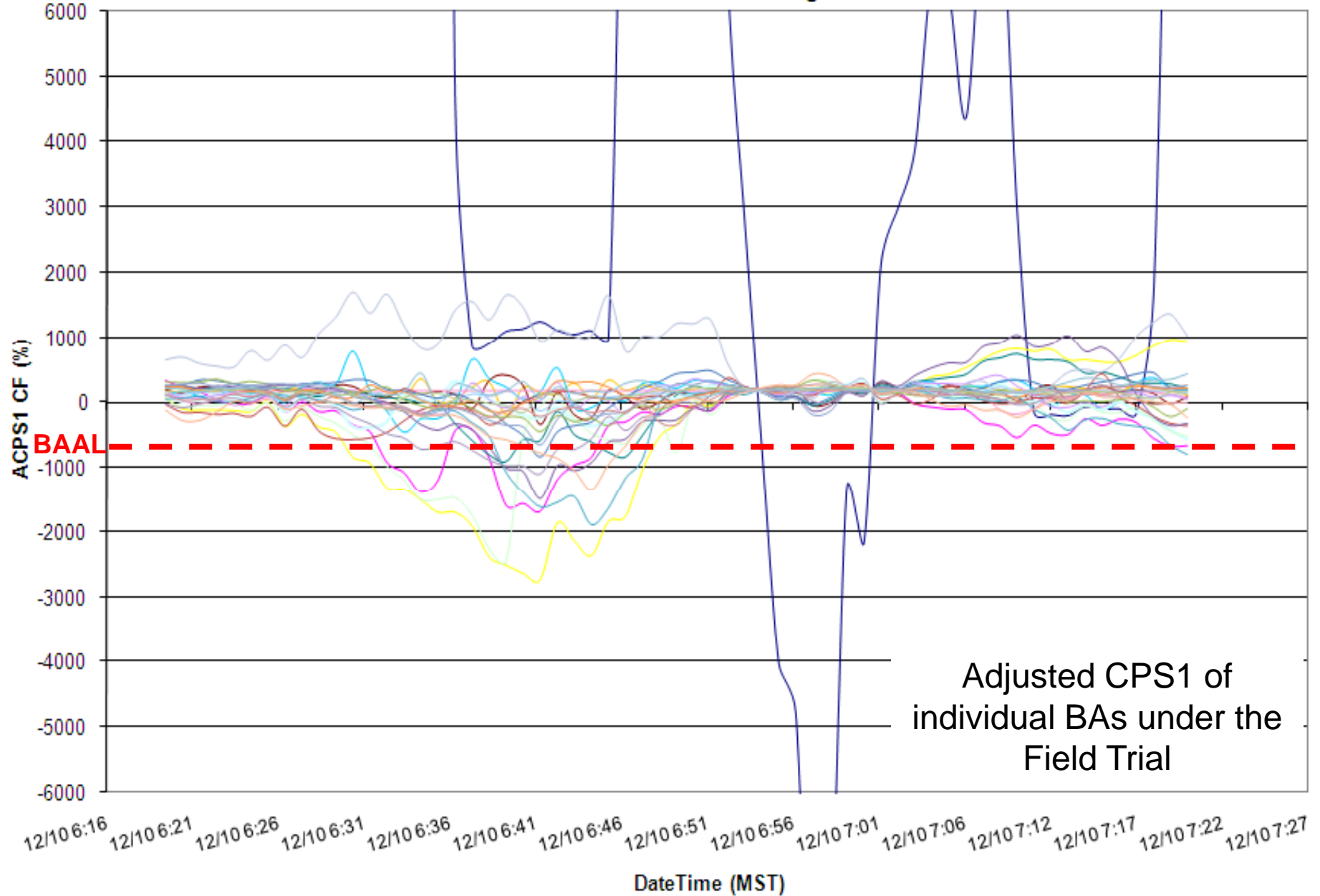
Clock-minute Actual Frequency of Participants

12/10/2010 ending 6:42 MST

1 minute duration below FTL_{Low}

60.02 Scheduled Frequency TEC.

ACPS1 Clock-Minute Averages



Adjusted CPS1 of
individual BAs under the
Field Trial

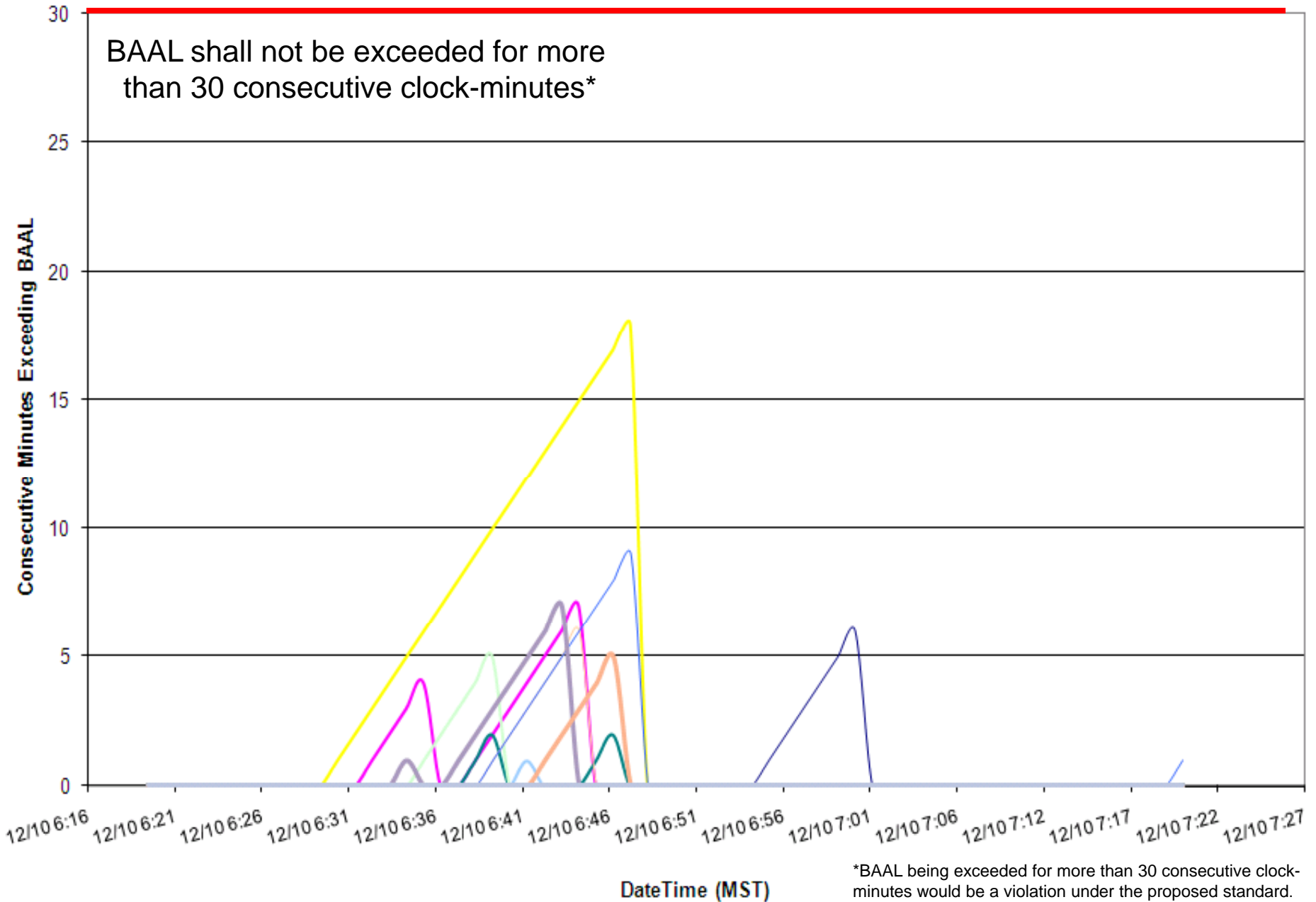
12/10/2010 ending 6:42 MST

1 minute duration below FTL_{Low}

60.02 Scheduled Frequency TEC.

Consecutive Minutes Exceeding BAAL

BAAL Violation*



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

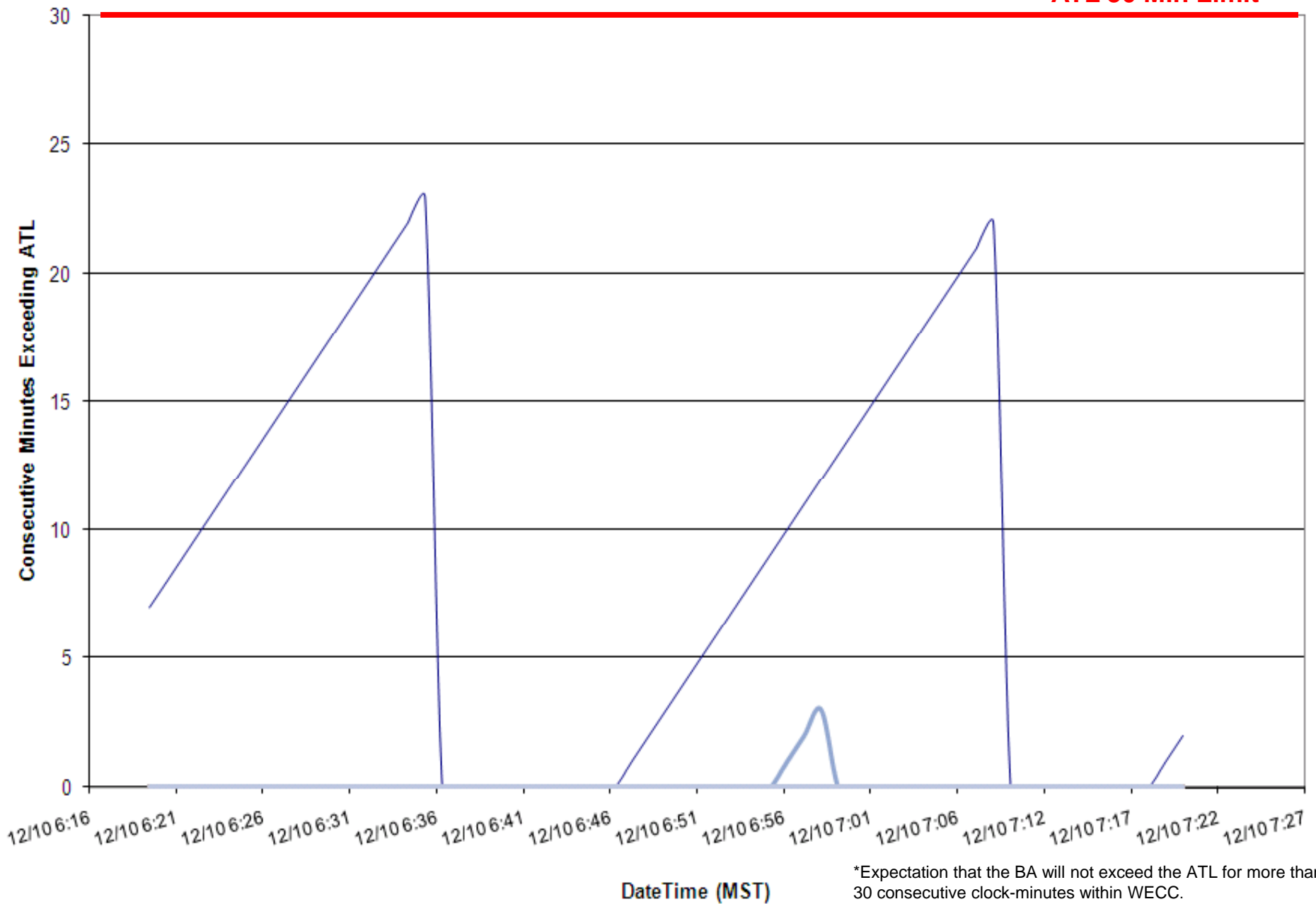
12/10/2010 ending 6:42 MST

1 minute duration below FTL_{Low}

60.02 Scheduled Frequency TEC.

Consecutive Minutes Exceeding ATL

ATL 30 Min Limit



*Expectation that the BA will not exceed the ATL for more than 30 consecutive clock-minutes within WECC.

12/10/2010 ending 00:35 MST

36 minute duration above BAAL_{High}

Clock-Minute Average Frequency

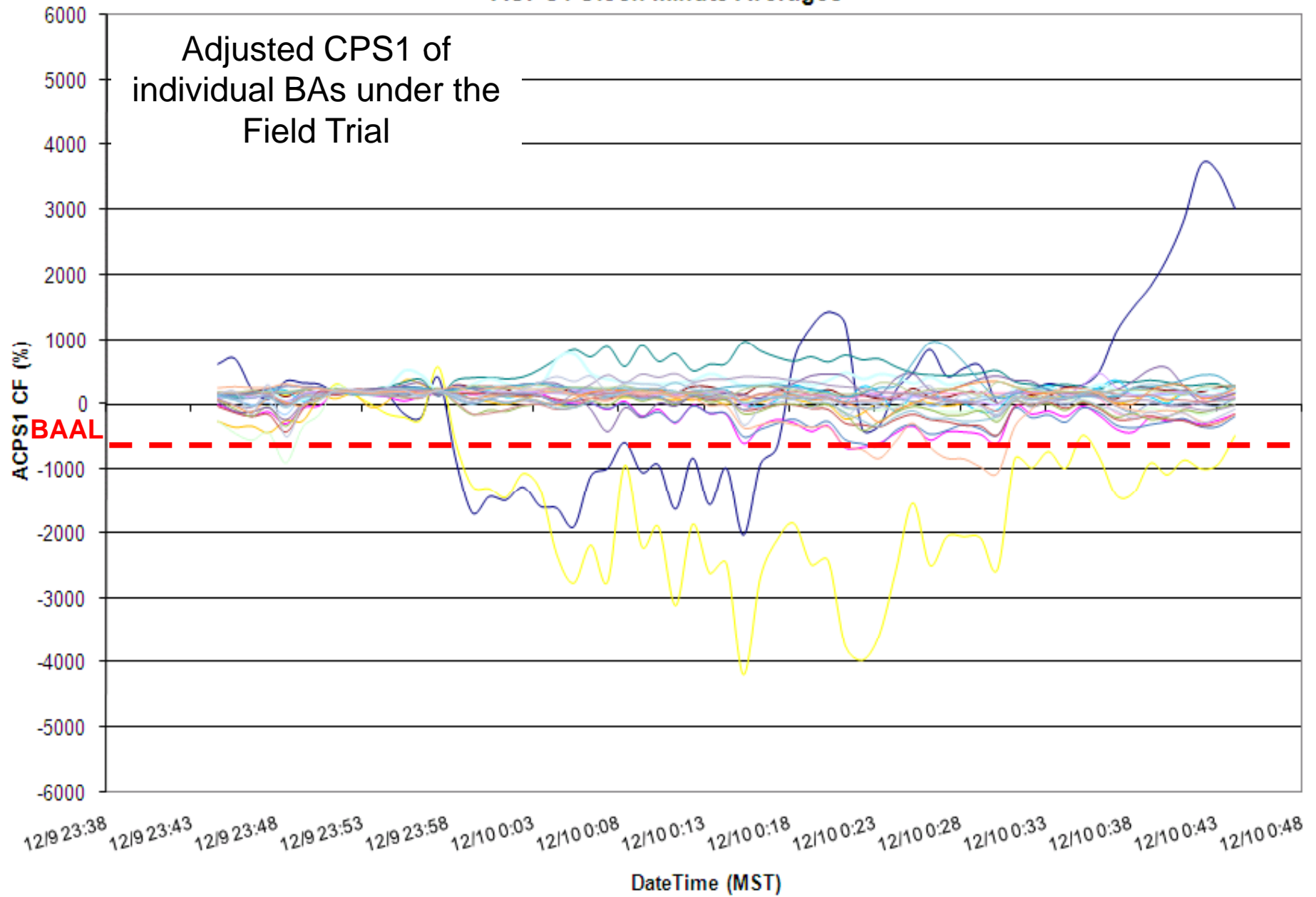


Clock-minute Actual Frequency of Participants

12/10/2010 ending 00:35 MST

36 minute duration above BAAL_{High}

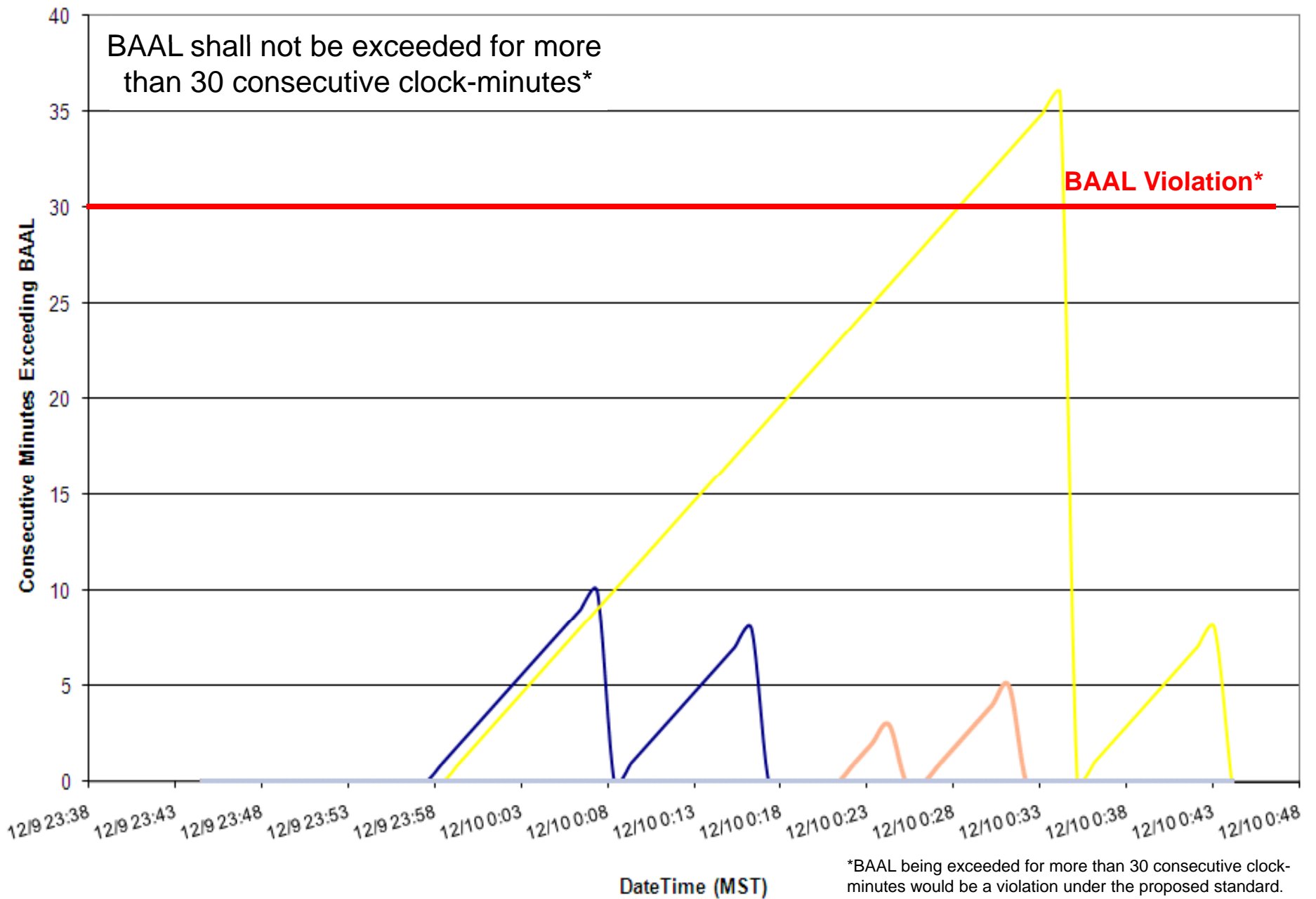
ACPS1 Clock-Minute Averages



12/10/2010 ending 00:35 MST

36 minute duration above BAAL_{High}

Consecutive Minutes Exceeding BAAL

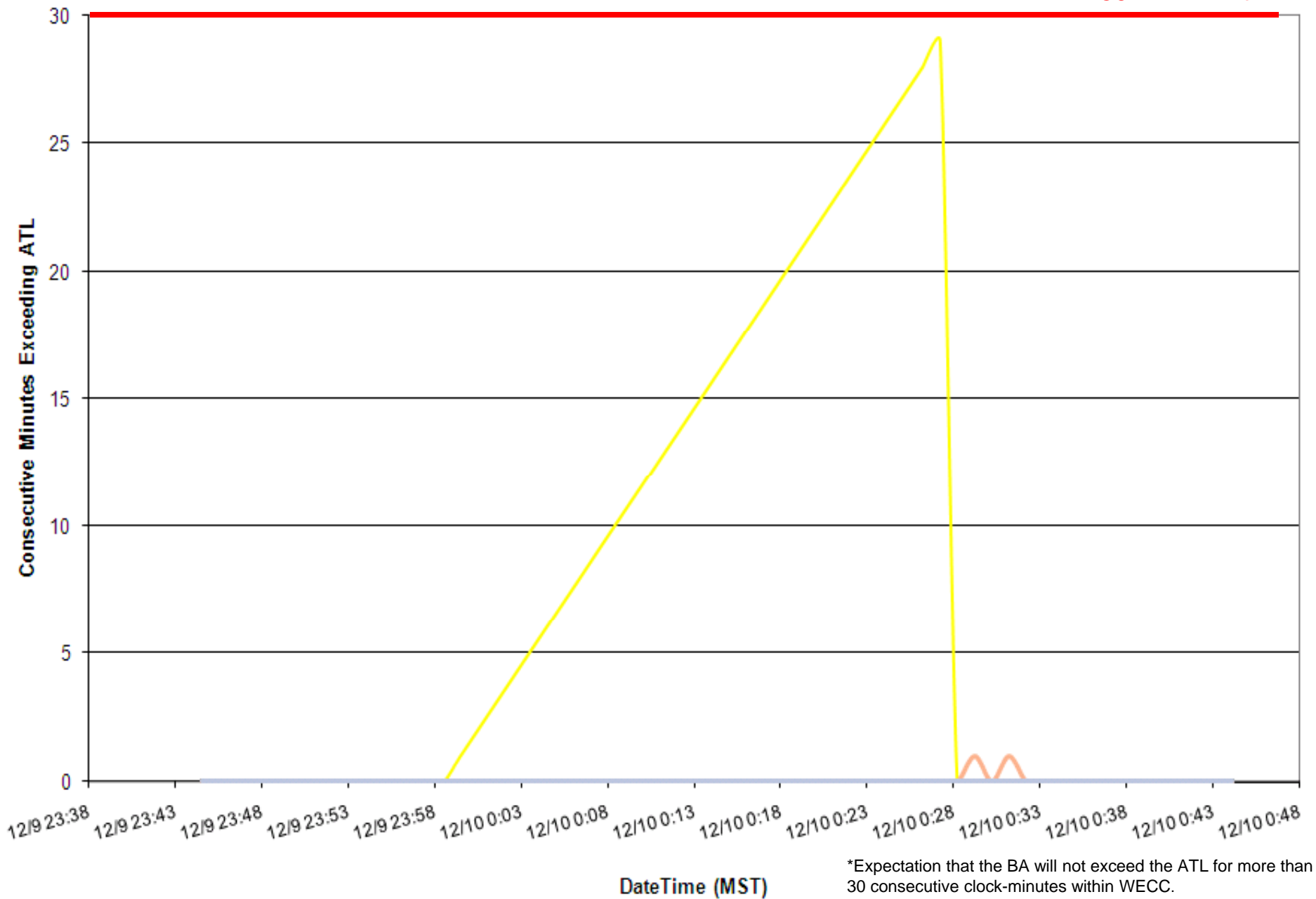


12/10/2010 ending 00:35 MST

36 minute duration above BAAL_{High}

Consecutive Minutes Exceeding ATL

ATL 30 Min Limit*



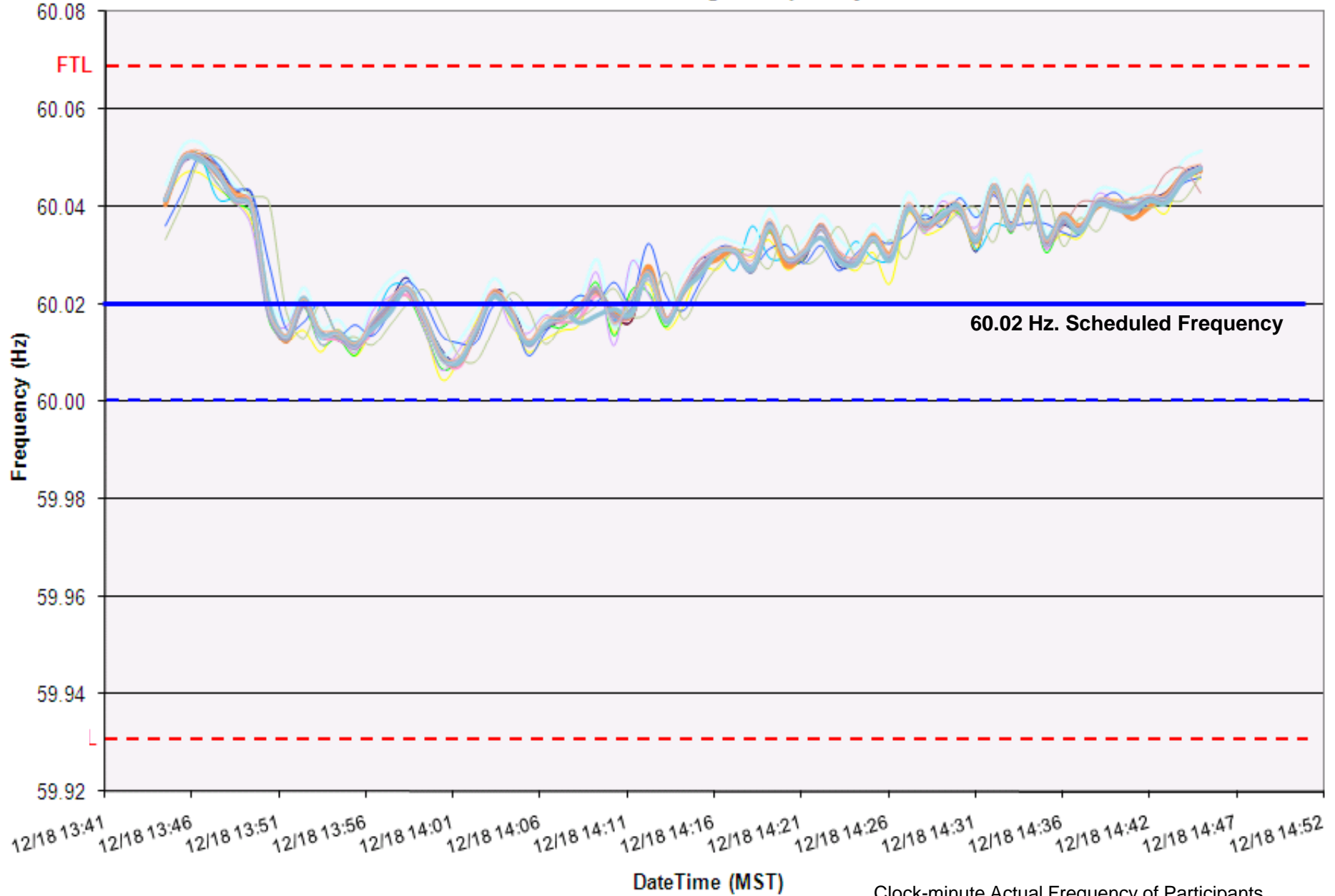
*Expectation that the BA will not exceed the ATL for more than 30 consecutive clock-minutes within WECC.

12/18/2010 ending 14:34 MST

31 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC

Clock-Minute Average Frequency



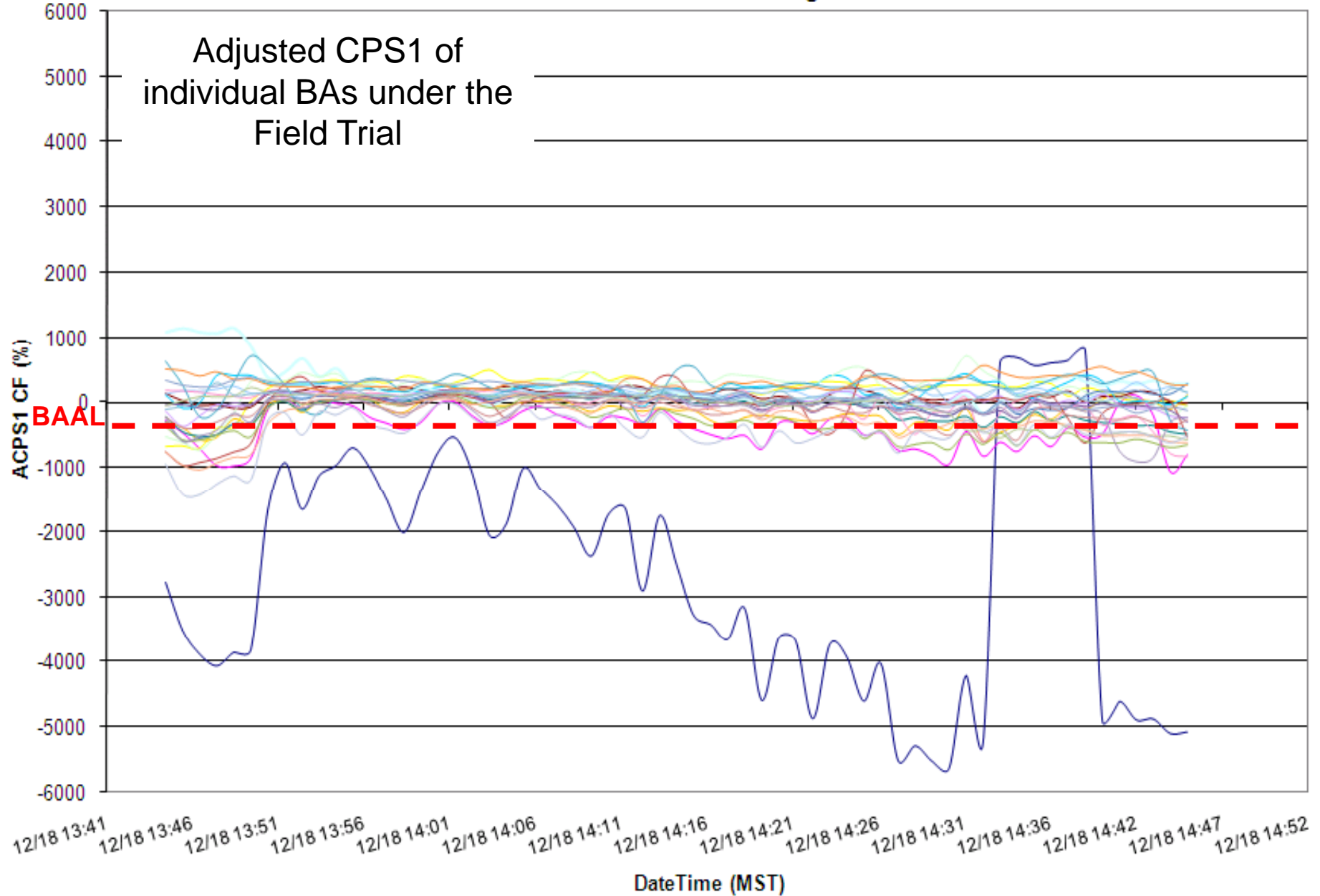
Clock-minute Actual Frequency of Participants

12/18/2010 ending 14:34 MST

31 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC

ACPS1 Clock-Minute Averages

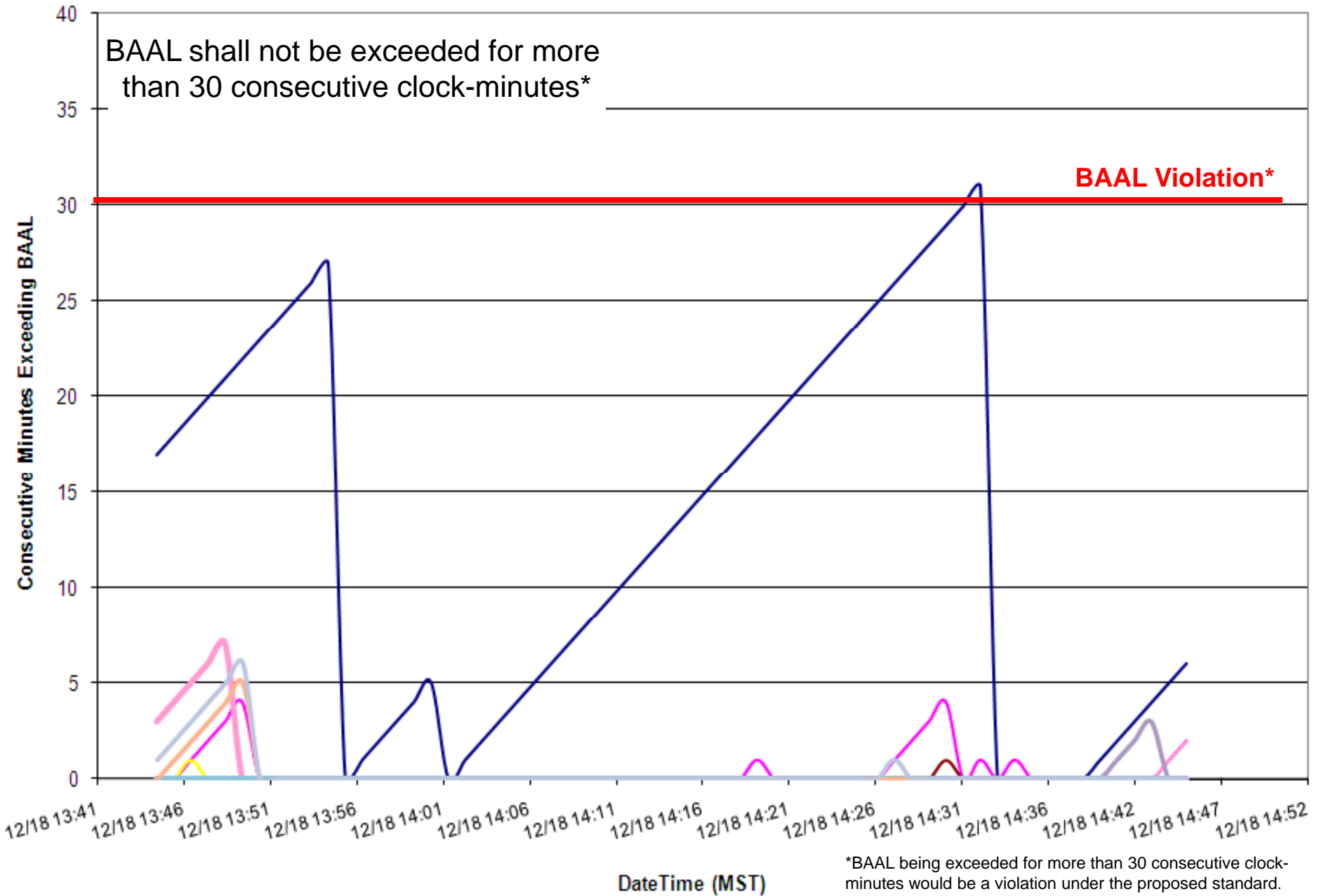


12/18/2010 ending 14:34 MST

31 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC

Consecutive Minutes Exceeding BAAL



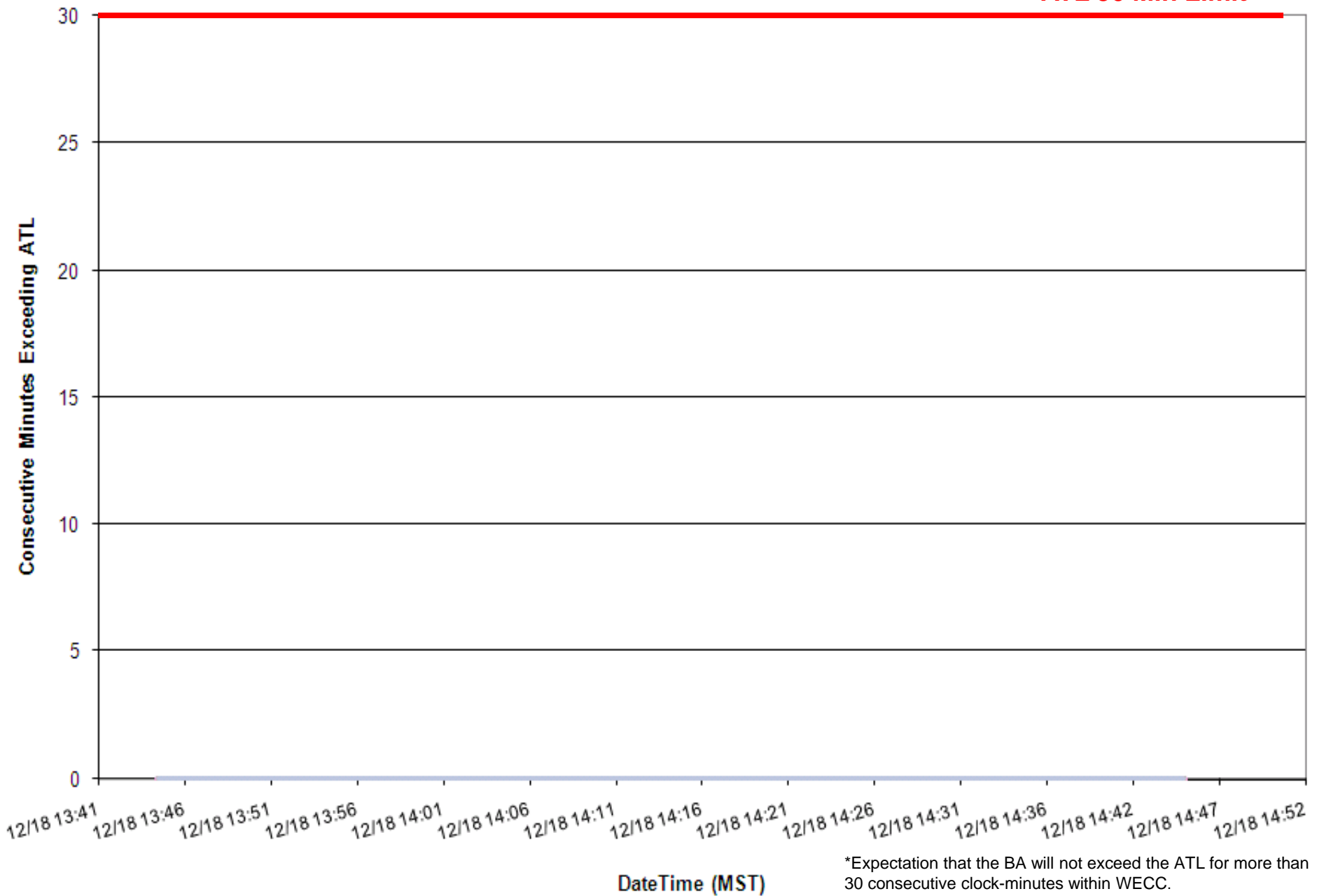
12/18/2010 ending 14:34 MST

31 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC

Consecutive Minutes Exceeding ATL

ATL 30 Min Limit*



*Expectation that the BA will not exceed the ATL for more than 30 consecutive clock-minutes within WECC.

12/22/2010 ending 00:19 MST

41 minute duration above BAAL_{High}

Clock-Minute Average Frequency

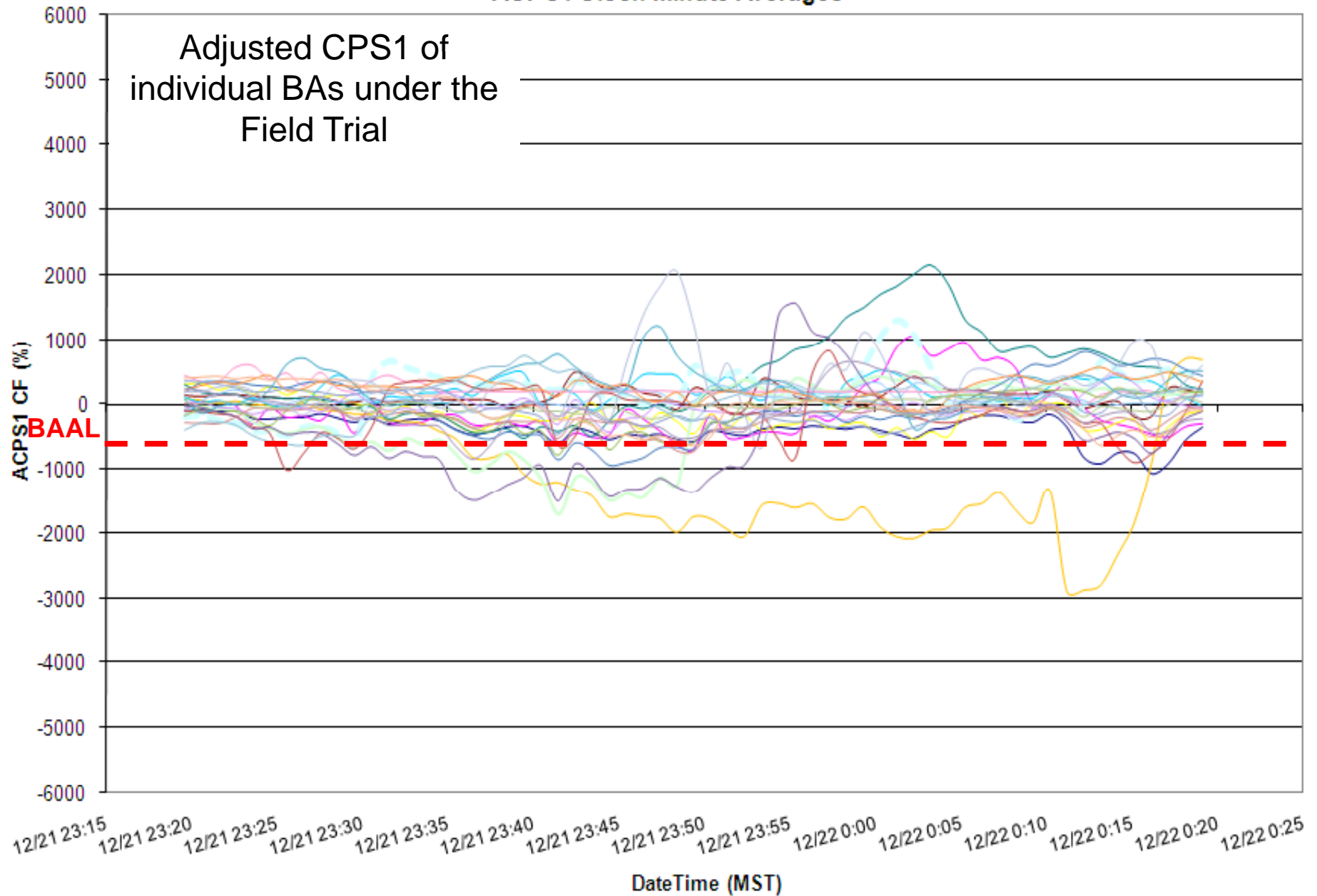


Clock-minute Actual Frequency of Participants

12/22/2010 ending 00:19 MST

41 minute duration above BAAL_{High}

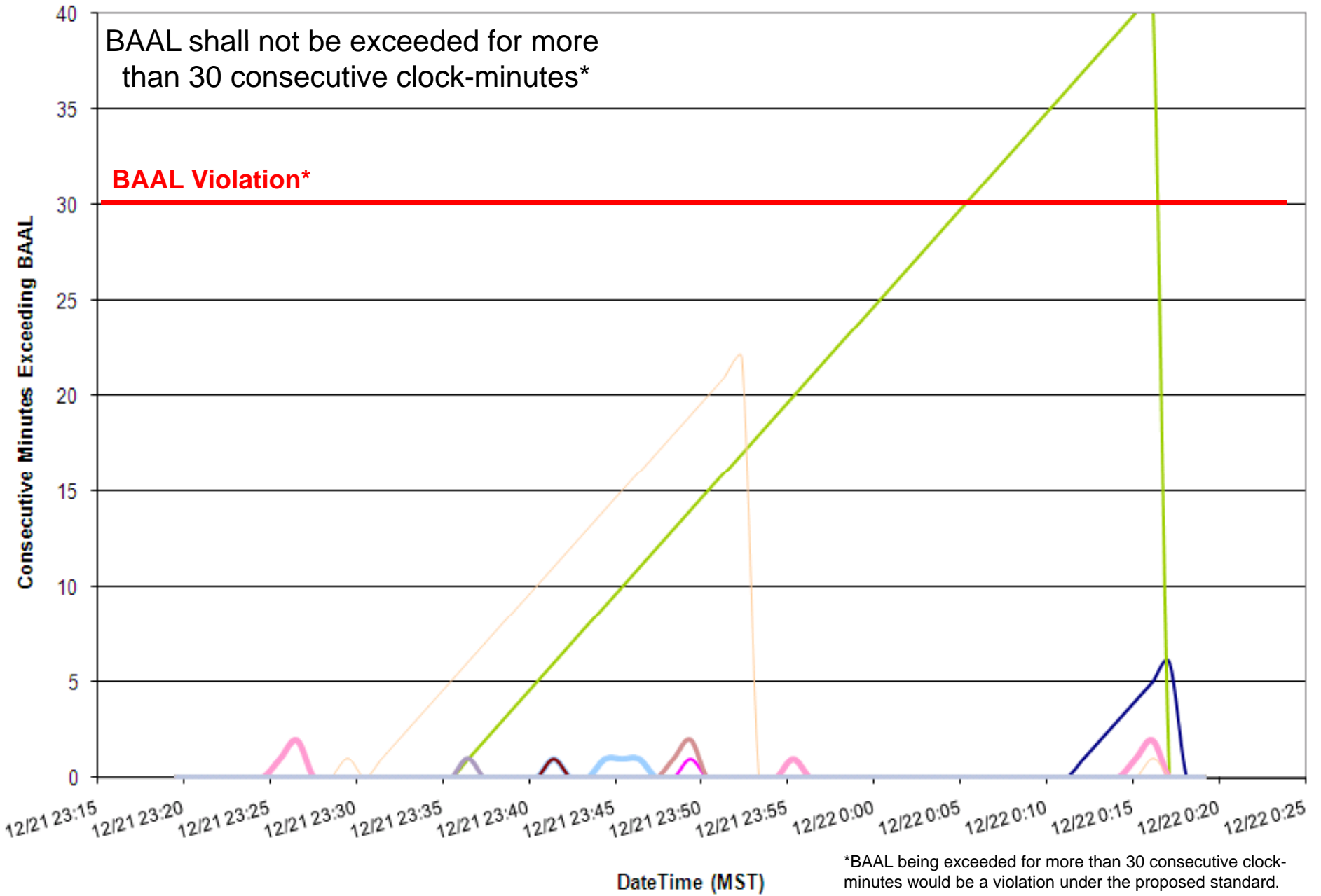
ACPS1 Clock-Minute Averages



12/22/2010 ending 00:19 MST

41 minute duration above BAAL_{High}

Consecutive Minutes Exceeding BAAL

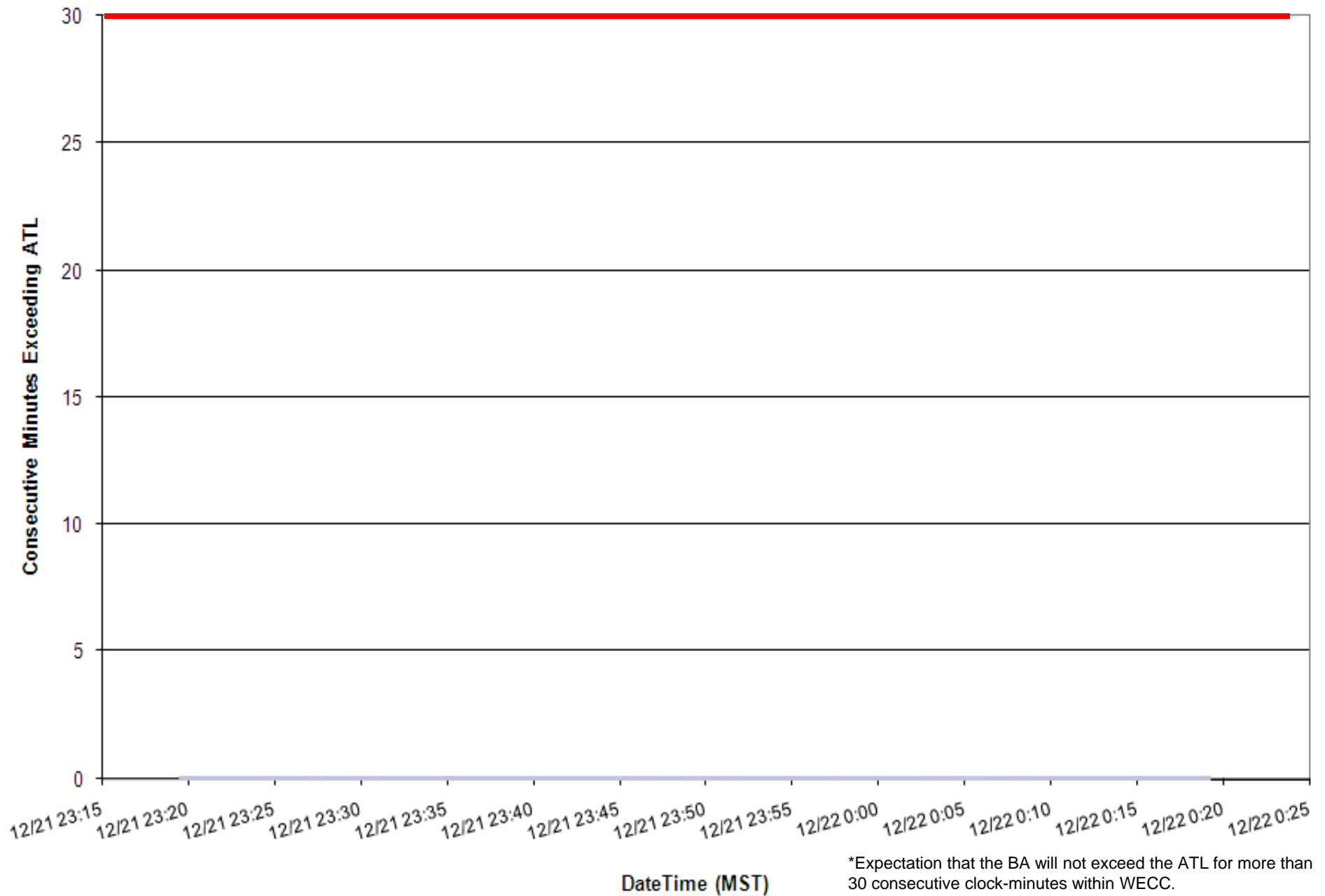


12/22/2010 ending 00:19 MST

41 minute duration above BAAL_{High}

Consecutive Minutes Exceeding ATL

ATL 30 Min Limit*



*Expectation that the BA will not exceed the ATL for more than 30 consecutive clock-minutes within WECC.

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

Project 2007-18 Reliability-Based Control Proof-of-Concept Field Trial							
Monthly Review of ACE Exceeding the Balancing Authority ACE Limit (BAAL) or ACE Transmission Limit (ATL)							
WECC							
<p>On a monthly basis, each Balancing Authority will review its performance for the prior month and identify any periods where the ACE exceeded the low BAAL ("BAAL_{low}"), the high BAAL ("BAAL_{high}"), the low ATL or high ATL for more than 30 consecutive clock-minutes. To help the RBCSDT gain a better understanding of the circumstances that all Balancing Authorities may be faced while operating under BAL-007, each Balancing Authority will provide a brief explanation of the circumstances related to any periods where the duration of consecutive clock-minutes exceeded 30 minutes. In the event that no period exceeded 30 minutes in the prior month, but the longest duration exceeded 25 minutes, the Balancing Authority will provide a brief explanation of the circumstances related to that longest-duration event.</p>							
Limit Exceeded (Enter one of the following: BAAL high, BAAL low, ATL high, ATL low)	Clock-minute of ACE exceeding the BAAL or ATL (mm/dd/yy hh:mm)	Clock-minute of ACE returning within the BAAL or ATL (mm/dd/yy hh:mm)	TimeZone	Total duration of ACE exceeding the BAAL or ATL (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
Low Limit Count (BAAL and ATL)	12/6/10 17:21	12/6/10 17:51	MST	31	0	1	A generator supplying approximately 110 MW tripped off-line.
BAAL High	12/10/10 0:28	12/10/10 0:36	MST	36	0	1	Unit A was coming off line and marketing had bought power to cover it but the unit did not come down very fast. The Operator moved the zzz units down 100 MW and had aaa unit #2 come down. Due to the statues of aaa unit#2 they could not ramp down very fast. Also the system frequency was very high which made the RBC high limit 30-50 MW.
ATL Low	12/14/10 14:32	12/14/10 15:10	MST	38	0	0	The operator submitted a curtailment of a NF schedule at 14:47, to begin ramping out at 14:50 (on a 10-minute ramp). The operator failed to realize that the schedule he curtailed was ending at the top of the hour, and that there was another schedule of equal MW value ramping in across the top. The net effect of his curtailment, which was ramping out over 10 minutes, was not enough to recover ACE within ATL because of the equal schedule ramping in over the normal 20-minute ramp window. At 15:00, the operator realized the error and submitted a curtailment on the new tag.
BAAL High	12/18/10 14:04	12/18/10 14:35	MST	31	0	0	The operator began capping generators to reduce output at 14:29 to recover within BAAL limits, however, the turbines were slower than normal to react to the "pause" signal. Typically, the wind turbines react within 2-3 minutes to reduce output, however, in this case it took 5 minutes to get the turbines to reduce output to the desired levels. The operator in question did not follow established XXXX procedure to initiate action to recover within BAAL limits when the violation counter reaches 15, and has been counseled on that failure.
BAAL High	12/21/10 22:42	12/21/10 23:19	PST	40	0	0	Combined cycle plant duct burner status incorrect. When status corrected, sufficient down-regulation then available to correct high ACE.
ATL High	12/27/10 23:10	12/27/10 23:45	MST	35	0	0	The operator responsible for monitoring BA 05 Baal/ATL performance got involved in helping his shift partners deal with an emergency in another operating area and failed to maintain situational awareness around BA 05. At 23:42 the operator realized he was over the 30-minute time limit and took action to reduce generation and recover ACE within ATL limits. The operator in question has been counseled on failure to maintain situational awareness in his area of responsibility, and his failure to adhere to XXXX procedure with regard to initiating action to recover ACE within limits using established timing parameters.
ATL High	12/30/10 8:58	12/30/10 9:26	PST	29	0	0	ATL outside of limits due to a combination of factors, 1) all generation already moving up due to earlier loss of resources, 2) large interchange ramp (1000 MW), 3) resource uninstructed deviations due to prices in the \$700 range caused previous loss of resources, 4) ramp constrained units slow in ACE recovery

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

Discussion

Doug Hils

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

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