

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

WECC Update Discussion
December 27, 2010

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
11/4/2010 10:46	PDT	-0.07	59.9303	60.0000
11/4/2010 10:47	PDT	-0.12	59.8782	60.0000
11/4/2010 10:48	PDT	-0.13	59.8690	60.0000
11/4/2010 10:49	PDT	-0.12	59.8777	60.0000
11/4/2010 10:50	PDT	-0.09	59.9130	60.0000
11/9/2010 5:02	PST	-0.09	59.9252	60.0200
PrevailingTime	PTimeZone	FreqError	ActualFreq	SchedFreq
11/3/10 18:04	PDT	0.07	60.0682	60.00
11/3/10 18:05	PDT	0.07	60.0730	60.00
11/3/10 18:06	PDT	0.07	60.0696	60.00

11/4/2010 - Total loss of 2122 MW in the northwest.

11/9/2010 – loss of 263 MW, several BAs negative ACE at the same time.

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	BAAL _{Low}		BAAL _{High}		ATL _{Low}		ATL _{High}		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	MinCtLow	Max	MinCtHigh	Max	MinCtLow2	Max	MinCtHigh2	Max	LowLimitCt	Max	HighLimitCt
BA05	44		42		58		49		28		42		55		37		56		42	
BA06	13		15		13		15		8		15		3		2		8		15	
BA07	21		22		29		41		15		15		7		6		15		15	
BA08	22		26		19		34		22		26		8		18		22		26	
BA09	11		9		15		55		3		1		1		0		3		1	
BA11	10		14		16		7		5		7		0		0		5		7	
BA12	10		11		14		17		7		4		4		3		7		4	
BA13	6		27		12		45		5		4		3		2		5		4	
BA14	7		31		6		55		6		5		0		0		6		5	
BA15	5		7		7		5		1		0		1		0		1		0	
BA16	14		14		25		34		14		14		8		12		15		14	
BA18	7		13		25		15		4		3		2		0		7		3	
BA19	11		16		30		34		9		14		2		5		9		14	
BA22	4		5		15		14		4		5		1		0		4		5	
BA23	9		18		13		27		6		18		3		1		6		18	
BA25	15		9		21		14		7		9		2		5		7		9	
BA26	13		23		43		41		12		20		9		24		12		24	
BA27	23		22		16		15		5		13		3		4		5		13	
BA28	13		23		38		39		13		23		16		31		16		31	
BA29	17		9		16		16		1		3		0		2		1		3	
BA30	19		18		47		39		10		3		32		2		33		3	
BA31	20		16		29		28		9		10		9		4		9		10	
BA33	26		13		28		58		19		6		6		12		19		12	
BA34	16		17		23		29		16		17		21		17		21		17	
BA36	69		16		114		25		69		13		114		20		114		20	

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 30-minute bounds being exceeded:

Date	Time	TimeZone	FreqError	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	MinCtLow2	MinCtHigh2	DateTimeMST
11/04/10	16:27	MDT	0.0118	60.0318	60.02	0	21	0	0	11/4/2010 15:27
11/04/10	16:28	MDT	0.0106	60.0306	60.02	0	22	0	0	11/4/2010 15:28
11/04/10	16:29	MDT	0.0093	60.0293	60.02	0	23	0	0	11/4/2010 15:29
11/04/10	16:30	MDT	0.0038	60.0238	60.02	0	24	0	0	11/4/2010 15:30
11/04/10	16:31	MDT	-0.0006	60.0194	60.02	0	25	0	0	11/4/2010 15:31
11/04/10	16:32	MDT	0.0065	60.0265	60.02	0	26	0	0	11/4/2010 15:32
11/04/10	16:33	MDT	0.0108	60.0308	60.02	0	27	0	0	11/4/2010 15:33
11/04/10	16:34	MDT	0.0201	60.0401	60.02	0	28	0	0	11/4/2010 15:34
11/04/10	16:35	MDT	0.0237	60.0437	60.02	0	29	0	0	11/4/2010 15:35
11/04/10	16:36	MDT	0.0170	60.0370	60.02	0	30	0	0	11/4/2010 15:36
11/04/10	16:37	MDT	0.0179	60.0379	60.02	0	31	0	0	11/4/2010 15:37
11/04/10	16:38	MDT	0.0163	60.0363	60.02	0	32	0	0	11/4/2010 15:38
11/04/10	16:39	MDT	0.0066	60.0266	60.02	0	33	0	0	11/4/2010 15:39
11/04/10	16:40	MDT	0.0033	60.0233	60.02	0	34	0	0	11/4/2010 15:40
11/04/10	16:41	MDT	0.0043	60.0243	60.02	0	35	0	0	11/4/2010 15:41
11/04/10	16:42	MDT	0.0031	60.0231	60.02	0	36	0	0	11/4/2010 15:42
11/04/10	16:43	MDT	0.0050	60.0250	60.02	0	37	0	0	11/4/2010 15:43
11/04/10	16:44	MDT	0.0024	60.0224	60.02	0	38	0	0	11/4/2010 15:44
11/04/10	17:28	MDT	-0.0160	60.0040	60.02	0	21	0	21	11/4/2010 16:28
11/04/10	17:29	MDT	-0.0151	60.0049	60.02	0	22	0	22	11/4/2010 16:29
11/04/10	17:30	MDT	-0.0181	60.0019	60.02	0	23	0	23	11/4/2010 16:30
11/04/10	17:31	MDT	-0.0134	60.0066	60.02	0	24	0	24	11/4/2010 16:31
11/04/10	17:32	MDT	-0.0112	60.0088	60.02	0	25	0	25	11/4/2010 16:32
11/04/10	17:33	MDT	-0.0060	60.0140	60.02	0	26	0	26	11/4/2010 16:33
11/04/10	17:34	MDT	-0.0120	60.0080	60.02	0	27	0	27	11/4/2010 16:34
11/04/10	17:35	MDT	-0.0076	60.0124	60.02	0	28	0	28	11/4/2010 16:35
11/04/10	17:36	MDT	-0.0098	60.0102	60.02	0	29	0	29	11/4/2010 16:36
11/04/10	17:37	MDT	-0.0096	60.0104	60.02	0	30	0	30	11/4/2010 16:37
11/04/10	17:38	MDT	-0.0027	60.0173	60.02	0	31	0	0	11/4/2010 16:38
11/04/10	17:39	MDT	-0.0108	60.0092	60.02	0	32	0	0	11/4/2010 16:39
11/04/10	17:40	MDT	-0.0145	60.0055	60.02	0	33	0	0	11/4/2010 16:40

Statistics of 30-minute bounds being exceeded:

Date	Time	TimeZone	FreqError	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	MinCtLow2	MinCtHigh2	DateTimeMST
11/05/10	9:31	MDT	0.0087	60.0087	60.00	0	0	21	0	11/5/2010 8:31
11/05/10	9:32	MDT	0.0123	60.0123	60.00	0	0	22	0	11/5/2010 8:32
11/05/10	9:33	MDT	0.0064	60.0064	60.00	0	0	23	0	11/5/2010 8:33
11/05/10	9:34	MDT	0.0059	60.0059	60.00	0	0	24	0	11/5/2010 8:34
11/05/10	9:35	MDT	0.0042	60.0042	60.00	0	0	25	0	11/5/2010 8:35
11/05/10	9:36	MDT	0.0023	60.0023	60.00	0	0	26	0	11/5/2010 8:36
11/05/10	9:37	MDT	-0.0011	59.9989	60.00	0	0	27	0	11/5/2010 8:37
11/05/10	9:38	MDT	-0.0019	59.9981	60.00	0	0	28	0	11/5/2010 8:38
11/05/10	9:39	MDT	-0.0032	59.9968	60.00	1	0	29	0	11/5/2010 8:39
11/05/10	9:40	MDT	0.0023	60.0023	60.00	0	0	30	0	11/5/2010 8:40
11/05/10	9:41	MDT	-0.0078	59.9922	60.00	1	0	31	0	11/5/2010 8:41
11/05/10	9:42	MDT	-0.0023	59.9977	60.00	0	0	32	0	11/5/2010 8:42
11/05/10	9:43	MDT	0.0059	60.0059	60.00	0	0	33	0	11/5/2010 8:43
11/05/10	9:44	MDT	-0.0050	59.9950	60.00	1	0	34	0	11/5/2010 8:44
11/05/10	9:45	MDT	-0.0114	59.9886	60.00	2	0	35	0	11/5/2010 8:45
11/05/10	9:46	MDT	-0.0020	59.9980	60.00	0	0	36	0	11/5/2010 8:46
11/05/10	9:47	MDT	-0.0098	59.9902	60.00	1	0	37	0	11/5/2010 8:47
11/05/10	9:48	MDT	-0.0137	59.9863	60.00	2	0	38	0	11/5/2010 8:48
11/05/10	9:49	MDT	-0.0123	59.9877	60.00	3	0	39	0	11/5/2010 8:49
11/05/10	9:50	MDT	0.0011	60.0011	60.00	0	0	40	0	11/5/2010 8:50
11/05/10	9:51	MDT	0.0028	60.0028	60.00	0	0	41	0	11/5/2010 8:51
11/05/10	9:52	MDT	-0.0154	59.9846	60.00	1	0	42	0	11/5/2010 8:52
11/05/10	9:53	MDT	-0.0150	59.9850	60.00	2	0	43	0	11/5/2010 8:53
11/05/10	9:54	MDT	-0.0159	59.9841	60.00	3	0	44	0	11/5/2010 8:54
11/05/10	9:55	MDT	-0.0215	59.9785	60.00	4	0	45	0	11/5/2010 8:55
11/05/10	9:56	MDT	-0.0173	59.9827	60.00	5	0	46	0	11/5/2010 8:56
11/05/10	9:57	MDT	-0.0178	59.9822	60.00	6	0	47	0	11/5/2010 8:57
11/05/10	9:58	MDT	-0.0178	59.9822	60.00	7	0	48	0	11/5/2010 8:58
11/05/10	9:59	MDT	-0.0154	59.9846	60.00	8	0	49	0	11/5/2010 8:59
11/05/10	10:00	MDT	-0.0081	59.9919	60.00	9	0	50	0	11/5/2010 9:00
11/05/10	10:01	MDT	-0.0051	59.9949	60.00	10	0	0	0	11/5/2010 9:01
11/05/10	10:02	MDT	-0.0096	59.9904	60.00	11	0	0	0	11/5/2010 9:02
11/05/10	10:03	MDT	-0.0148	59.9852	60.00	12	0	1	0	11/5/2010 9:03
11/05/10	10:04	MDT	-0.0104	59.9896	60.00	13	0	2	0	11/5/2010 9:04
11/05/10	10:05	MDT	-0.0047	59.9953	60.00	14	0	0	0	11/5/2010 9:05

Statistics of 30-minute bounds being exceeded:

Date	Time	TimeZone	FreqError	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	MinCtLow2	MinCtHigh2	DateTimeMST
11/05/10	11:24	MDT	0.0001	60.0001	60.00	0	0	21	0	11/5/2010 10:24
11/05/10	11:25	MDT	-0.0010	59.9990	60.00	0	0	22	0	11/5/2010 10:25
11/05/10	11:26	MDT	-0.0054	59.9946	60.00	1	0	23	0	11/5/2010 10:26
11/05/10	11:27	MDT	-0.0084	59.9916	60.00	2	0	24	0	11/5/2010 10:27
11/05/10	11:28	MDT	-0.0107	59.9893	60.00	3	0	25	0	11/5/2010 10:28
11/05/10	11:29	MDT	-0.0157	59.9843	60.00	4	0	26	0	11/5/2010 10:29
11/05/10	11:30	MDT	-0.0201	59.9799	60.00	5	0	27	0	11/5/2010 10:30
11/05/10	11:31	MDT	-0.0195	59.9805	60.00	6	0	28	0	11/5/2010 10:31
11/05/10	11:32	MDT	-0.0155	59.9845	60.00	7	0	29	0	11/5/2010 10:32
11/05/10	11:33	MDT	-0.0136	59.9864	60.00	8	0	30	0	11/5/2010 10:33
11/05/10	11:34	MDT	-0.0106	59.9894	60.00	9	0	31	0	11/5/2010 10:34
11/05/10	11:35	MDT	0.0029	60.0029	60.00	0	0	32	0	11/5/2010 10:35
11/05/10	11:36	MDT	-0.0048	59.9952	60.00	1	0	33	0	11/5/2010 10:36
11/05/10	11:37	MDT	-0.0093	59.9907	60.00	2	0	34	0	11/5/2010 10:37
11/05/10	11:38	MDT	-0.0082	59.9918	60.00	3	0	35	0	11/5/2010 10:38
11/05/10	11:39	MDT	0.0080	60.0080	60.00	0	0	36	0	11/5/2010 10:39
11/05/10	11:40	MDT	0.0079	60.0079	60.00	0	0	37	0	11/5/2010 10:40
11/05/10	11:41	MDT	0.0012	60.0012	60.00	0	0	38	0	11/5/2010 10:41
11/05/10	11:42	MDT	0.0059	60.0059	60.00	0	0	39	0	11/5/2010 10:42
11/05/10	11:43	MDT	-0.0015	59.9985	60.00	0	0	40	0	11/5/2010 10:43
11/05/10	11:44	MDT	-0.0027	59.9973	60.00	1	0	41	0	11/5/2010 10:44
11/05/10	11:45	MDT	-0.0004	59.9996	60.00	0	0	42	0	11/5/2010 10:45
11/05/10	11:46	MDT	0.0087	60.0087	60.00	0	0	43	0	11/5/2010 10:46
11/05/10	11:47	MDT	0.0153	60.0153	60.00	0	0	44	0	11/5/2010 10:47
11/05/10	11:48	MDT	0.0044	60.0044	60.00	0	0	45	0	11/5/2010 10:48
11/05/10	11:49	MDT	0.0035	60.0035	60.00	0	0	46	0	11/5/2010 10:49
11/05/10	11:50	MDT	0.0031	60.0031	60.00	0	0	47	0	11/5/2010 10:50
11/05/10	11:51	MDT	-0.0044	59.9956	60.00	1	0	48	0	11/5/2010 10:51
11/05/10	11:52	MDT	0.0000	60.0000	60.00	0	0	49	0	11/5/2010 10:52
11/05/10	11:53	MDT	0.0021	60.0021	60.00	0	0	50	0	11/5/2010 10:53
11/05/10	11:54	MDT	0.0042	60.0042	60.00	0	0	51	0	11/5/2010 10:54
11/05/10	11:55	MDT	0.0028	60.0028	60.00	0	0	52	0	11/5/2010 10:55
11/05/10	11:56	MDT	-0.0058	59.9942	60.00	1	0	53	0	11/5/2010 10:56
11/05/10	11:57	MDT	-0.0077	59.9923	60.00	2	0	54	0	11/5/2010 10:57
11/05/10	11:58	MDT	-0.0122	59.9878	60.00	3	0	55	0	11/5/2010 10:58
11/05/10	11:59	MDT	-0.0099	59.9901	60.00	4	0	0	0	11/5/2010 10:59

Statistics of 30-minute bounds being exceeded:

Date	Time	TimeZone	FreqError	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	MinCtLow2	MinCtHigh2	DateTimeMST
11/06/10	3:28	MDT	-0.0069	59.9931	60.00	0	0	0	20	11/6/2010 2:28
11/06/10	3:29	MDT	-0.0033	59.9967	60.00	0	0	0	21	11/6/2010 2:29
11/06/10	3:30	MDT	0.0003	60.0003	60.00	0	0	0	22	11/6/2010 2:30
11/06/10	3:31	MDT	0.0079	60.0079	60.00	0	1	0	23	11/6/2010 2:31
11/06/10	3:32	MDT	0.0155	60.0155	60.00	0	2	0	24	11/6/2010 2:32
11/06/10	3:33	MDT	0.0173	60.0173	60.00	0	3	0	25	11/6/2010 2:33
11/06/10	3:34	MDT	0.0143	60.0143	60.00	0	4	0	26	11/6/2010 2:34
11/06/10	3:35	MDT	0.0151	60.0151	60.00	0	5	0	27	11/6/2010 2:35
11/06/10	3:36	MDT	0.0198	60.0198	60.00	0	6	0	28	11/6/2010 2:36
11/06/10	3:37	MDT	0.0031	60.0031	60.00	0	7	0	29	11/6/2010 2:37
11/06/10	3:38	MDT	0.0142	60.0142	60.00	0	8	0	30	11/6/2010 2:38
11/06/10	3:39	MDT	0.0152	60.0152	60.00	0	9	0	31	11/6/2010 2:39
11/06/10	3:40	MDT	0.0151	60.0151	60.00	0	10	0	32	11/6/2010 2:40
11/06/10	3:41	MDT	0.0265	60.0265	60.00	0	11	0	33	11/6/2010 2:41
11/06/10	3:42	MDT	0.0190	60.0190	60.00	0	12	0	34	11/6/2010 2:42
11/06/10	3:43	MDT	0.0220	60.0220	60.00	0	13	0	35	11/6/2010 2:43
11/06/10	3:44	MDT	0.0181	60.0181	60.00	0	14	0	36	11/6/2010 2:44
11/06/10	3:45	MDT	0.0067	60.0067	60.00	0	15	0	37	11/6/2010 2:45
11/26/10	13:46	MST	0.0168	60.0368	60.02	0	21	0	0	11/26/2010 13:46
11/26/10	13:47	MST	0.0114	60.0314	60.02	0	22	0	0	11/26/2010 13:47
11/26/10	13:48	MST	0.0115	60.0315	60.02	0	23	0	0	11/26/2010 13:48
11/26/10	13:49	MST	0.0075	60.0275	60.02	0	24	0	0	11/26/2010 13:49
11/26/10	13:50	MST	0.0085	60.0285	60.02	0	25	0	0	11/26/2010 13:50
11/26/10	13:51	MST	0.0099	60.0299	60.02	0	26	0	0	11/26/2010 13:51
11/26/10	13:52	MST	0.0144	60.0344	60.02	0	27	0	0	11/26/2010 13:52
11/26/10	13:53	MST	0.0148	60.0348	60.02	0	28	0	0	11/26/2010 13:53
11/26/10	13:54	MST	0.0107	60.0307	60.02	0	29	0	0	11/26/2010 13:54
11/26/10	13:55	MST	0.0068	60.0268	60.02	0	30	0	0	11/26/2010 13:55
11/26/10	13:56	MST	0.0059	60.0259	60.02	0	31	0	0	11/26/2010 13:56
11/26/10	13:57	MST	0.0009	60.0209	60.02	0	32	0	0	11/26/2010 13:57
11/26/10	13:58	MST	0.0001	60.0201	60.02	0	33	0	0	11/26/2010 13:58
11/26/10	13:59	MST	0.0080	60.0280	60.02	0	34	0	0	11/26/2010 13:59
11/26/10	14:00	MST	0.0040	60.0240	60.02	0	35	0	0	11/26/2010 14:00
11/26/10	14:01	MST	0.0068	60.0268	60.02	0	36	0	0	11/26/2010 14:01
11/26/10	14:02	MST	0.0141	60.0342	60.02	0	37	0	0	11/26/2010 14:02
11/26/10	14:03	MST	0.0103	60.0303	60.02	0	38	0	0	11/26/2010 14:03
11/26/10	14:04	MST	0.0087	60.0287	60.02	0	39	0	0	11/26/2010 14:04
11/26/10	14:05	MST	0.0076	60.0276	60.02	0	40	0	0	11/26/2010 14:05
11/26/10	14:06	MST	0.0119	60.0319	60.02	0	41	0	0	11/26/2010 14:06
11/26/10	14:07	MST	0.0061	60.0261	60.02	0	42	0	0	11/26/2010 14:07

Statistics of 30-minute bounds being exceeded:

Date	Time	TimeZone	FreqError	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	MinCtLow2	MinCtHigh2	DateTimeMST
11/11/10	3:45	PST	0.0064	60.0064	60.00	0	0	20	0	11/11/2010 4:45
11/11/10	3:46	PST	0.0195	60.0195	60.00	0	0	21	0	11/11/2010 4:46
11/11/10	3:47	PST	0.0255	60.0255	60.00	0	0	22	0	11/11/2010 4:47
11/11/10	3:48	PST	0.0319	60.0319	60.00	0	0	23	0	11/11/2010 4:48
11/11/10	3:49	PST	0.0244	60.0244	60.00	0	0	24	0	11/11/2010 4:49
11/11/10	3:50	PST	0.0149	60.0149	60.00	0	0	25	0	11/11/2010 4:50
11/11/10	3:51	PST	0.0048	60.0048	60.00	0	0	26	0	11/11/2010 4:51
11/11/10	3:52	PST	-0.0028	59.9972	60.00	0	0	27	0	11/11/2010 4:52
11/11/10	3:53	PST	-0.0063	59.9937	60.00	0	0	28	0	11/11/2010 4:53
11/11/10	3:54	PST	-0.0049	59.9951	60.00	0	0	29	0	11/11/2010 4:54
11/11/10	3:55	PST	-0.0108	59.9892	60.00	0	0	30	0	11/11/2010 4:55
11/11/10	3:56	PST	-0.0058	59.9942	60.00	0	0	31	0	11/11/2010 4:56
11/11/10	3:57	PST	-0.0087	59.9913	60.00	0	0	32	0	11/11/2010 4:57
11/18/10	13:32	PST	0.0117	59.9917	59.98	11	0	21	0	11/18/2010 14:32
11/18/10	13:33	PST	0.0162	59.9962	59.98	0	0	22	0	11/18/2010 14:33
11/18/10	13:34	PST	0.0198	59.9998	59.98	0	0	23	0	11/18/2010 14:34
11/18/10	13:35	PST	0.0277	60.0077	59.98	0	0	24	0	11/18/2010 14:35
11/18/10	13:36	PST	0.0153	59.9953	59.98	0	0	25	0	11/18/2010 14:36
11/18/10	13:37	PST	0.0164	59.9964	59.98	0	0	26	0	11/18/2010 14:37
11/18/10	13:38	PST	0.0102	59.9902	59.98	1	0	27	0	11/18/2010 14:38
11/18/10	13:39	PST	0.0105	59.9905	59.98	2	0	28	0	11/18/2010 14:39
11/18/10	13:40	PST	0.0083	59.9883	59.98	3	0	29	0	11/18/2010 14:40
11/18/10	13:41	PST	0.0075	59.9875	59.98	4	0	30	0	11/18/2010 14:41
11/18/10	13:42	PST	0.0020	59.9820	59.98	5	0	31	0	11/18/2010 14:42
11/18/10	13:43	PST	0.0056	59.9856	59.98	6	0	32	0	11/18/2010 14:43
11/18/10	13:44	PST	0.0084	59.9884	59.98	7	0	33	0	11/18/2010 14:44
11/18/10	13:45	PST	-0.0020	59.9780	59.98	8	0	34	0	11/18/2010 14:45
11/18/10	13:46	PST	0.0057	59.9857	59.98	9	0	35	0	11/18/2010 14:46
11/18/10	13:47	PST	-0.0002	59.9798	59.98	10	0	36	0	11/18/2010 14:47
11/18/10	13:48	PST	0.0085	59.9885	59.98	11	0	37	0	11/18/2010 14:48
11/18/10	13:49	PST	0.0059	59.9859	59.98	12	0	38	0	11/18/2010 14:49
11/18/10	13:50	PST	0.0025	59.9825	59.98	13	0	39	0	11/18/2010 14:50
11/18/10	13:51	PST	0.0047	59.9847	59.98	14	0	40	0	11/18/2010 14:51

Statistics of 30-minute bounds being exceeded:

Date	Time	TimeZone	FreqError	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	MinCtLow2	MinCtHigh2	DateTimeMST
11/18/10	13:52	PST	0.0112	59.9912	59.98	15	0	41	0	11/18/2010 14:52
11/18/10	13:53	PST	0.0182	59.9982	59.98	0	0	42	0	11/18/2010 14:53
11/18/10	13:54	PST	0.0172	59.9972	59.98	0	0	43	0	11/18/2010 14:54
11/18/10	13:55	PST	0.0122	59.9922	59.98	1	0	44	0	11/18/2010 14:55
11/18/10	13:56	PST	0.0164	59.9964	59.98	0	0	45	0	11/18/2010 14:56
11/18/10	13:57	PST	0.0154	59.9954	59.98	1	0	46	0	11/18/2010 14:57
11/18/10	13:58	PST	0.0069	59.9869	59.98	2	0	47	0	11/18/2010 14:58
11/18/10	13:59	PST	0.0026	59.9826	59.98	3	0	48	0	11/18/2010 14:59
11/18/10	14:00	PST	0.0020	59.9820	59.98	4	0	49	0	11/18/2010 15:00
11/18/10	14:01	PST	-0.0021	59.9779	59.98	5	0	50	0	11/18/2010 15:01
11/18/10	14:02	PST	0.0003	59.9803	59.98	6	0	51	0	11/18/2010 15:02
11/18/10	14:03	PST	-0.0084	59.9716	59.98	7	0	52	0	11/18/2010 15:03
11/18/10	14:04	PST	-0.0137	59.9663	59.98	8	0	53	0	11/18/2010 15:04
11/18/10	14:05	PST	-0.0186	59.9614	59.98	9	0	54	0	11/18/2010 15:05
11/18/10	14:06	PST	-0.0190	59.9610	59.98	10	0	55	0	11/18/2010 15:06
11/18/10	14:07	PST	-0.0280	59.9520	59.98	11	0	56	0	11/18/2010 15:07
11/18/10	14:08	PST	-0.0242	59.9558	59.98	12	0	57	0	11/18/2010 15:08
11/18/10	14:09	PST	-0.0119	59.9681	59.98	13	0	58	0	11/18/2010 15:09
11/18/10	14:10	PST	-0.0159	59.9641	59.98	14	0	59	0	11/18/2010 15:10
11/18/10	14:11	PST	-0.0134	59.9666	59.98	15	0	60	0	11/18/2010 15:11
11/18/10	14:12	PST	-0.0173	59.9626	59.98	16	0	61	0	11/18/2010 15:12
11/18/10	14:13	PST	-0.0075	59.9725	59.98	17	0	62	0	11/18/2010 15:13
11/18/10	14:14	PST	-0.0190	59.9610	59.98	18	0	63	0	11/18/2010 15:14
11/18/10	14:15	PST	-0.0144	59.9656	59.98	19	0	64	0	11/18/2010 15:15
11/18/10	14:16	PST	-0.0171	59.9629	59.98	20	0	65	0	11/18/2010 15:16
11/18/10	14:17	PST	-0.0166	59.9634	59.98	21	0	66	0	11/18/2010 15:17
11/18/10	14:18	PST	-0.0193	59.9607	59.98	22	0	67	0	11/18/2010 15:18
11/18/10	14:19	PST	-0.0165	59.9635	59.98	23	0	68	0	11/18/2010 15:19
11/18/10	14:20	PST	-0.0142	59.9658	59.98	24	0	69	0	11/18/2010 15:20
11/18/10	14:21	PST	-0.0203	59.9597	59.98	25	0	70	0	11/18/2010 15:21
11/18/10	14:22	PST	-0.0161	59.9639	59.98	26	0	71	0	11/18/2010 15:22
11/18/10	14:23	PST	-0.0146	59.9654	59.98	27	0	72	0	11/18/2010 15:23
11/18/10	14:24	PST	-0.0111	59.9689	59.98	28	0	73	0	11/18/2010 15:24
11/18/10	14:25	PST	-0.0080	59.9720	59.98	29	0	74	0	11/18/2010 15:25
11/18/10	14:26	PST	-0.0002	59.9798	59.98	30	0	75	0	11/18/2010 15:26
11/18/10	14:27	PST	0.0025	59.9825	59.98	31	0	76	0	11/18/2010 15:27
11/18/10	14:28	PST	0.0063	59.9863	59.98	32	0	77	0	11/18/2010 15:28
11/18/10	14:29	PST	0.0100	59.9900	59.98	33	0	78	0	11/18/2010 15:29
11/18/10	14:30	PST	0.0056	59.9856	59.98	34	0	79	0	11/18/2010 15:30

Statistics of 30-minute bounds being exceeded:

Date	Time	TimeZone	FreqError	ActualFreq	SchedFreq	MinCtLow	MinCtHigh	MinCtLow2	MinCtHigh2	DateTimeMST
11/18/10	14:31	PST	0.0031	59.9831	59.98	35	0	80	0	11/18/2010 15:31
11/18/10	14:32	PST	0.0021	59.9821	59.98	36	0	81	0	11/18/2010 15:32
11/18/10	14:33	PST	0.0021	59.9821	59.98	37	0	82	0	11/18/2010 15:33
11/18/10	14:34	PST	0.0002	59.9802	59.98	38	0	83	0	11/18/2010 15:34
11/18/10	14:35	PST	0.0010	59.9810	59.98	39	0	84	0	11/18/2010 15:35
11/18/10	14:36	PST	0.0074	59.9874	59.98	40	0	85	0	11/18/2010 15:36
11/18/10	14:37	PST	0.0061	59.9861	59.98	41	0	86	0	11/18/2010 15:37
11/18/10	14:38	PST	0.0055	59.9855	59.98	42	0	87	0	11/18/2010 15:38
11/18/10	14:39	PST	0.0011	59.9811	59.98	43	0	88	0	11/18/2010 15:39
11/18/10	14:40	PST	-0.0029	59.9771	59.98	44	0	89	0	11/18/2010 15:40
11/18/10	14:41	PST	-0.0015	59.9785	59.98	45	0	90	0	11/18/2010 15:41
11/18/10	14:42	PST	-0.0071	59.9729	59.98	46	0	91	0	11/18/2010 15:42
11/18/10	14:43	PST	-0.0058	59.9742	59.98	47	0	92	0	11/18/2010 15:43
11/18/10	14:44	PST	-0.0041	59.9759	59.98	48	0	93	0	11/18/2010 15:44
11/18/10	14:45	PST	-0.0010	59.9790	59.98	49	0	94	0	11/18/2010 15:45
11/18/10	14:46	PST	0.0009	59.9809	59.98	50	0	95	0	11/18/2010 15:46
11/18/10	14:47	PST	-0.0035	59.9765	59.98	51	0	96	0	11/18/2010 15:47
11/18/10	14:48	PST	-0.0089	59.9711	59.98	52	0	97	0	11/18/2010 15:48
11/18/10	14:49	PST	-0.0093	59.9706	59.98	53	0	98	0	11/18/2010 15:49
11/18/10	14:50	PST	-0.0118	59.9682	59.98	54	0	99	0	11/18/2010 15:50
11/18/10	14:51	PST	-0.0114	59.9686	59.98	55	0	100	0	11/18/2010 15:51
11/18/10	14:52	PST	-0.0153	59.9647	59.98	56	0	101	0	11/18/2010 15:52
11/18/10	14:53	PST	0.0006	59.9806	59.98	57	0	102	0	11/18/2010 15:53
11/18/10	14:54	PST	-0.0025	59.9775	59.98	58	0	103	0	11/18/2010 15:54
11/18/10	14:55	PST	-0.0089	59.9711	59.98	59	0	104	0	11/18/2010 15:55
11/18/10	14:56	PST	-0.0124	59.9676	59.98	60	0	105	0	11/18/2010 15:56
11/18/10	14:57	PST	-0.0051	59.9749	59.98	61	0	106	0	11/18/2010 15:57
11/18/10	14:58	PST	-0.0017	59.9783	59.98	62	0	107	0	11/18/2010 15:58
11/18/10	14:59	PST	0.0042	59.9842	59.98	63	0	108	0	11/18/2010 15:59
11/18/10	15:00	PST	-0.0056	59.9744	59.98	64	0	109	0	11/18/2010 16:00
11/18/10	15:01	PST	-0.0104	59.9696	59.98	65	0	110	0	11/18/2010 16:01
11/18/10	15:02	PST	-0.0161	59.9639	59.98	66	0	111	0	11/18/2010 16:02
11/18/10	15:03	PST	-0.0186	59.9614	59.98	67	0	112	0	11/18/2010 16:03
11/18/10	15:04	PST	-0.0198	59.9602	59.98	68	0	113	0	11/18/2010 16:04
11/18/10	15:05	PST	-0.0188	59.9612	59.98	69	0	114	0	11/18/2010 16:05

Dates in this presentation:

11/04/2010 ending 10:50 PDT – Frequency below FTL_{Low} for 5 consecutive clock-minutes. Total loss of 2122 MW in the northwest.

11/04/2010 ending 16:44 MDT – ACE exceeding $BAAL_{High}$ for 38 consecutive clock-minutes - 60.02 Scheduled Frequency TEC.

11/04/2010 ending 17:40 MDT – ACE exceeding $BAAL_{High}$ for 33 consecutive clock-minutes - 60.02 Scheduled Frequency TEC.

11/18/2010 ending 15:05 MST – ACE more negative than $BAAL_{Low}$ for 69 consecutive clock-minutes and ATL_{Low} for 114 consecutive clock-minutes - 59.98 Scheduled Frequency TEC.

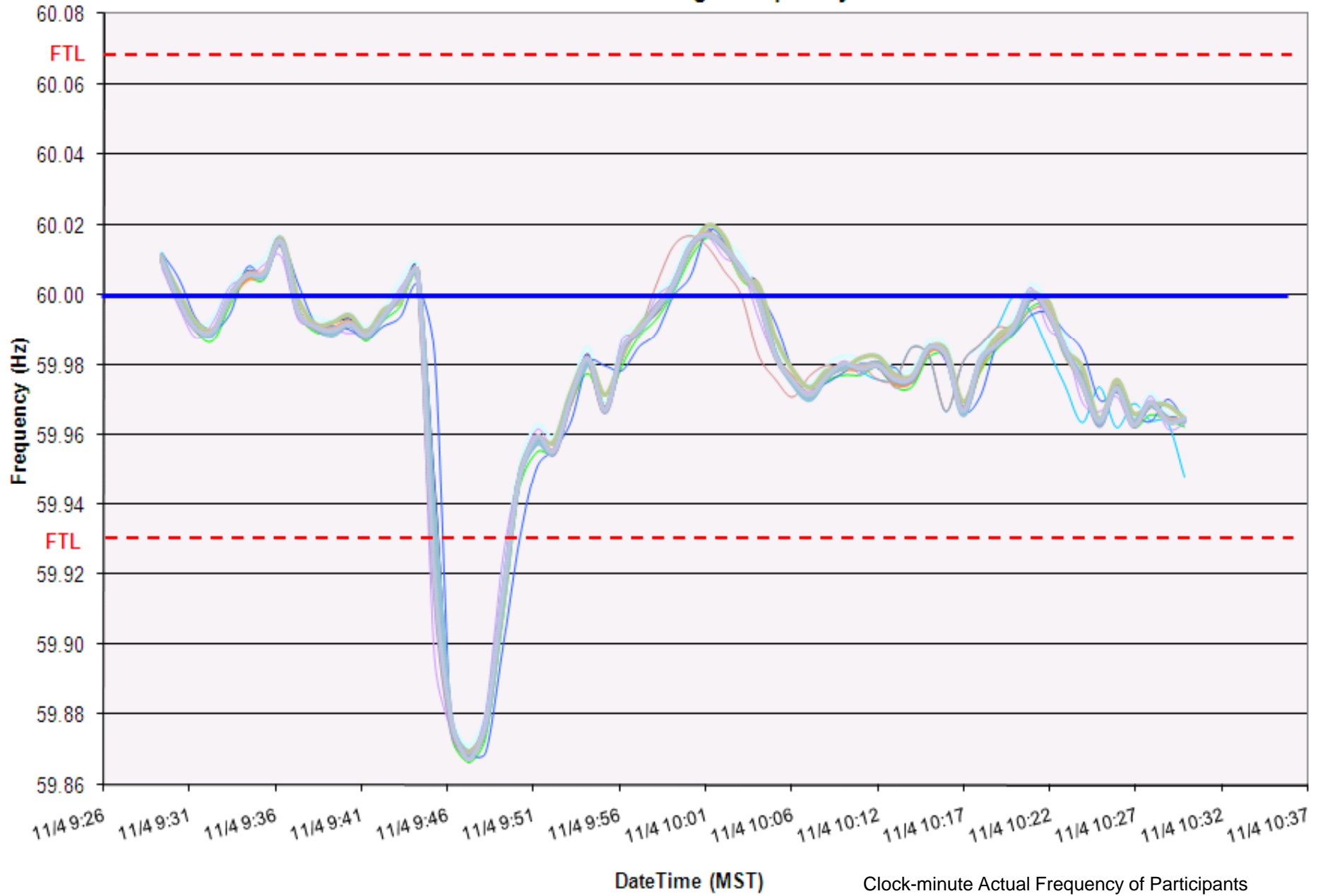
11/26/2010 ending 14:07 MST – ACE exceeding $BAAL_{High}$ for 42 consecutive clock-minutes - 60.02 Scheduled Frequency TEC.

¹ Under draft BAL-008, a proposed FTL_{Low} violation would occur when the actual frequency is lower than FTL_{Low} for more than 30 consecutive clock-minutes and a proposed FTL_{High} violation would occur when the actual frequency is greater than FTL_{High} for more than 30 consecutive clock-minutes.

² Under draft BAL-007, 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.

11/04/2010 ending 9:50 MST
5 minute duration below FTL_{Low}

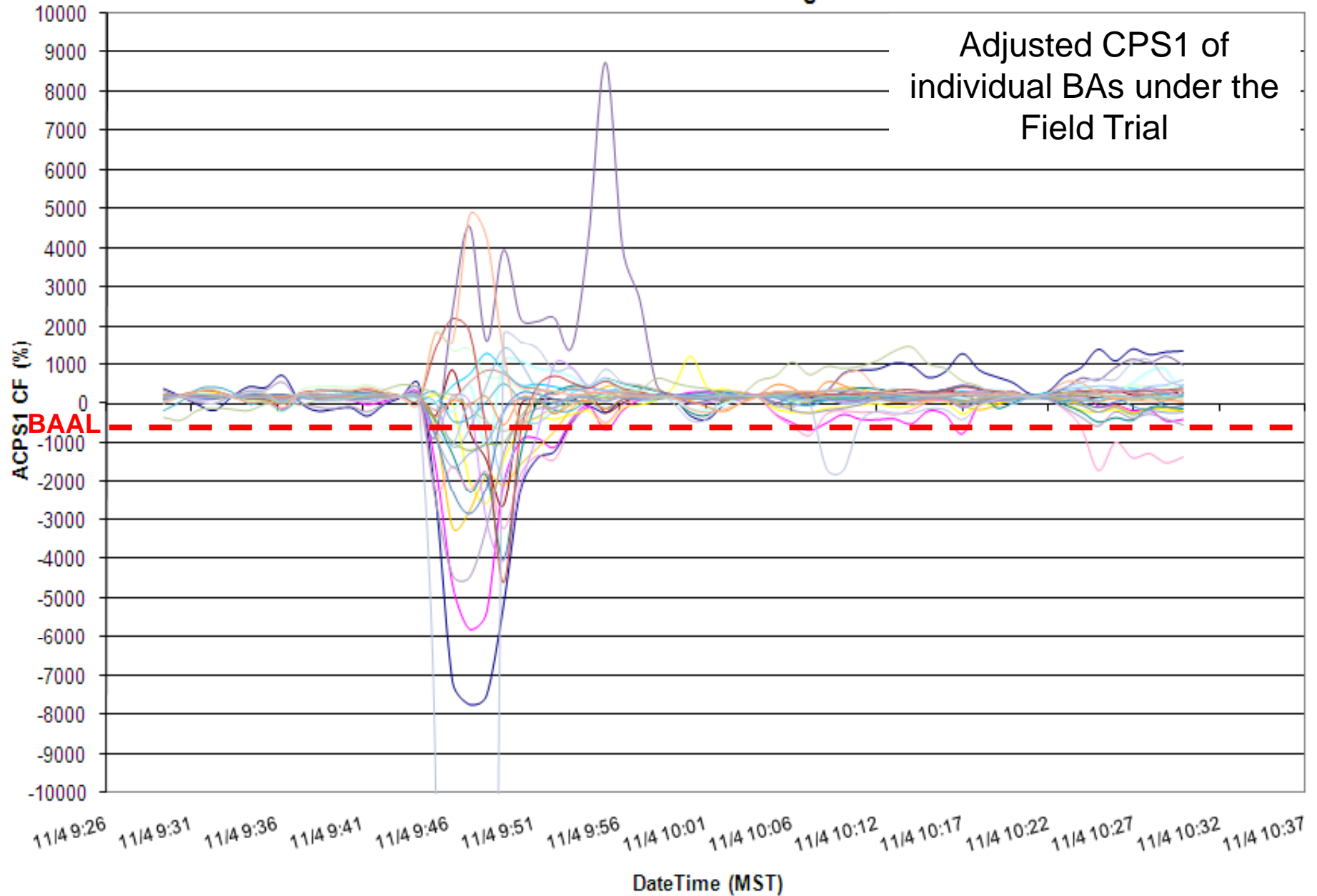
Clock-Minute Average Frequency



Clock-minute Actual Frequency of Participants

11/04/2010 ending 9:50 MST
5 minute duration below FTL_{Low}

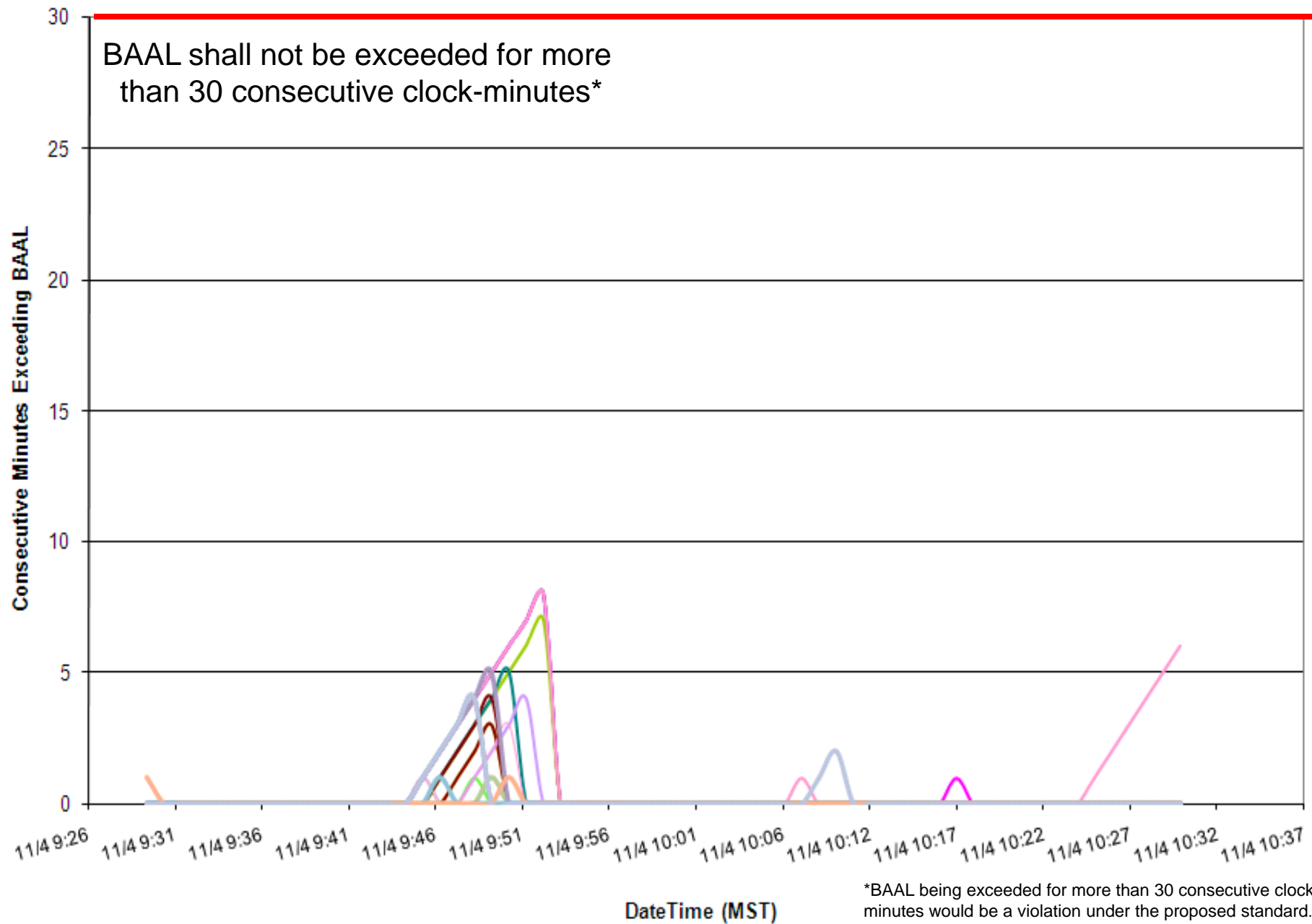
ACPS1 Clock-Minute Averages



11/04/2010 ending 9:50 MST
5 minute duration below FTL_{Low}

Consecutive Minutes Exceeding BAAL

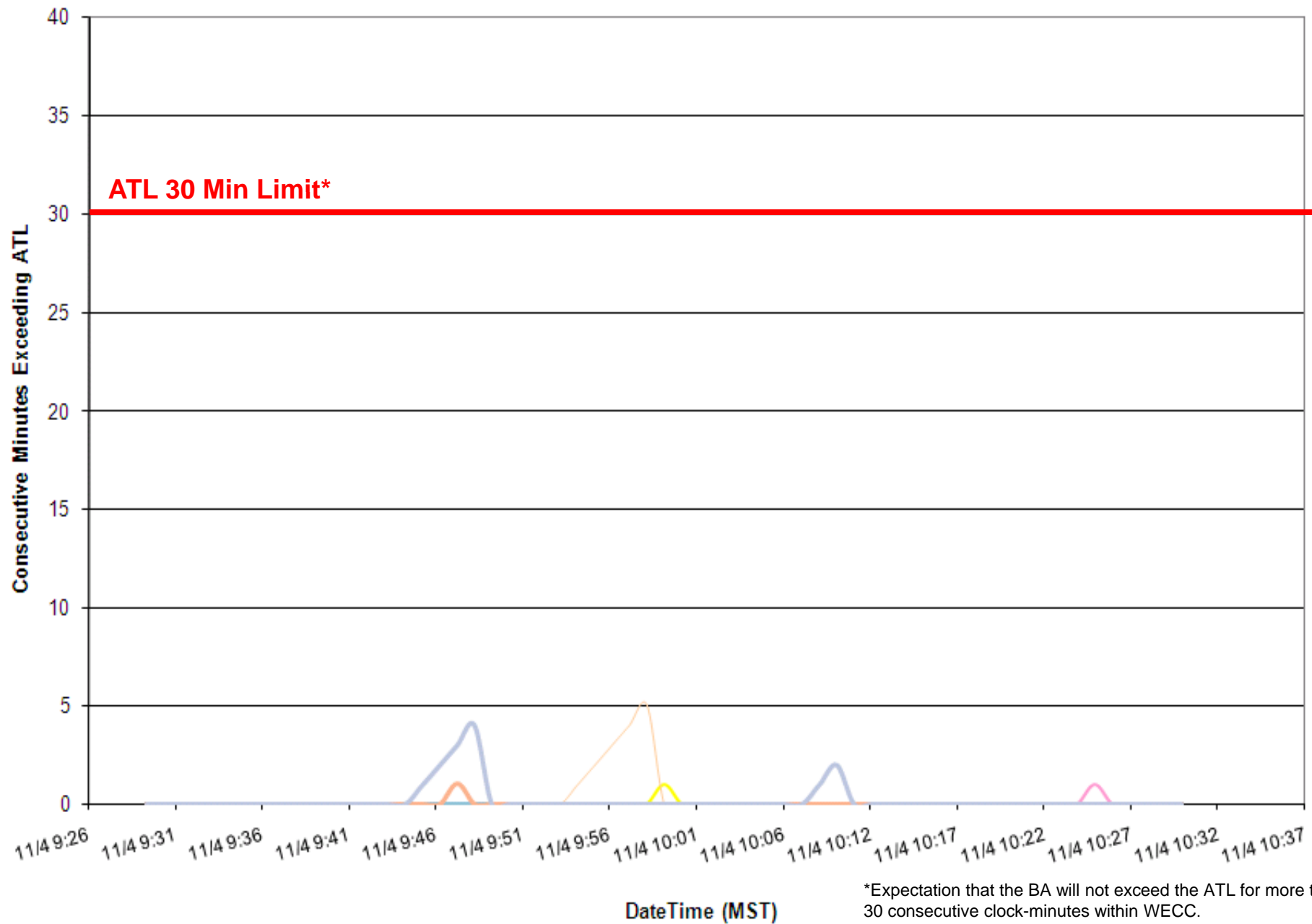
BAAL Violation*



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

11/04/2010 ending 9:50 MST
5 minute duration below FTL_{Low}

Consecutive Minutes Exceeding ATL



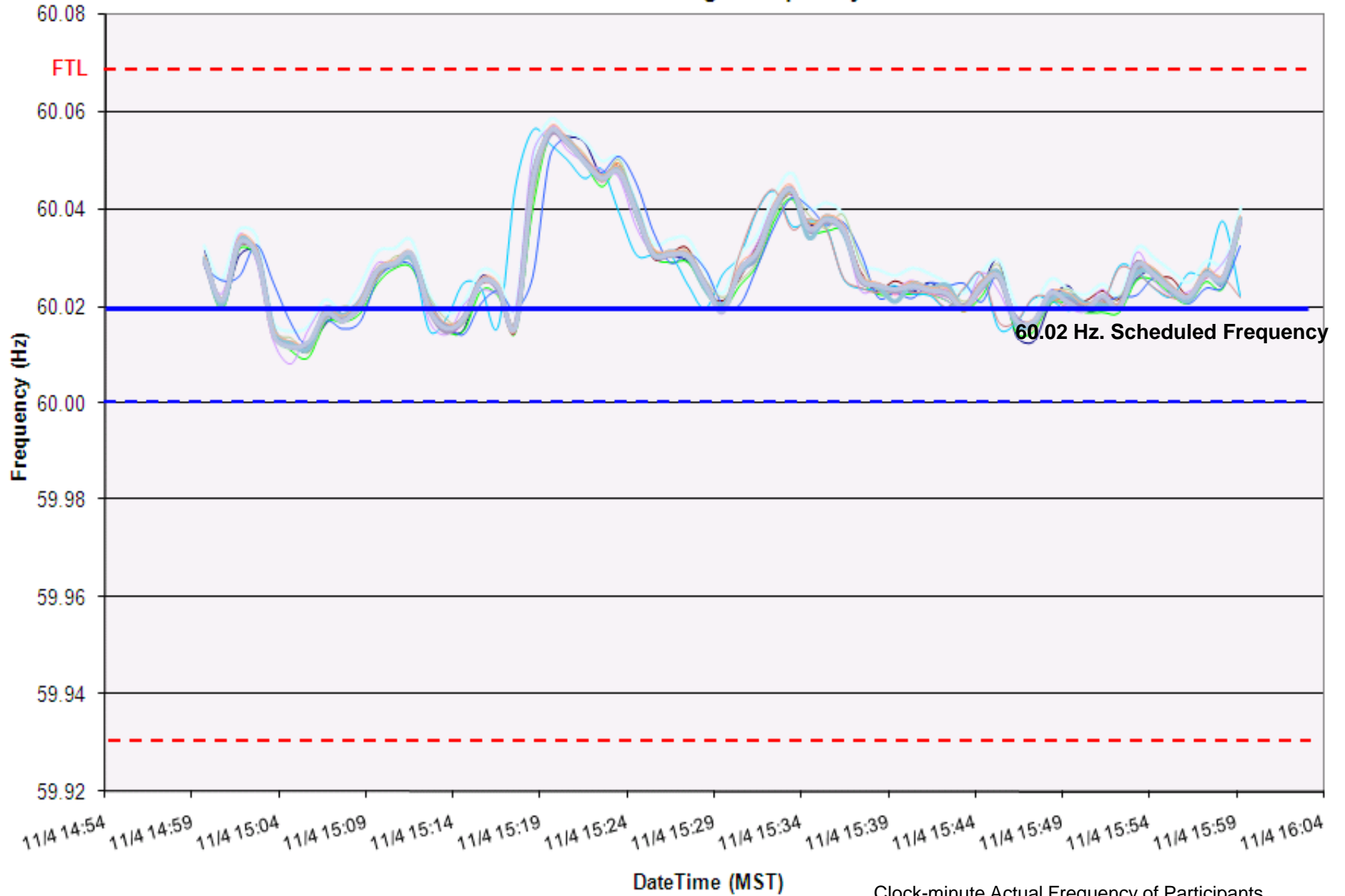
*Expectation that the BA will not exceed the ATL for more than 30 consecutive clock-minutes within WECC.

11/04/2010 ending 15:44 MST

38 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

Clock-Minute Average Frequency



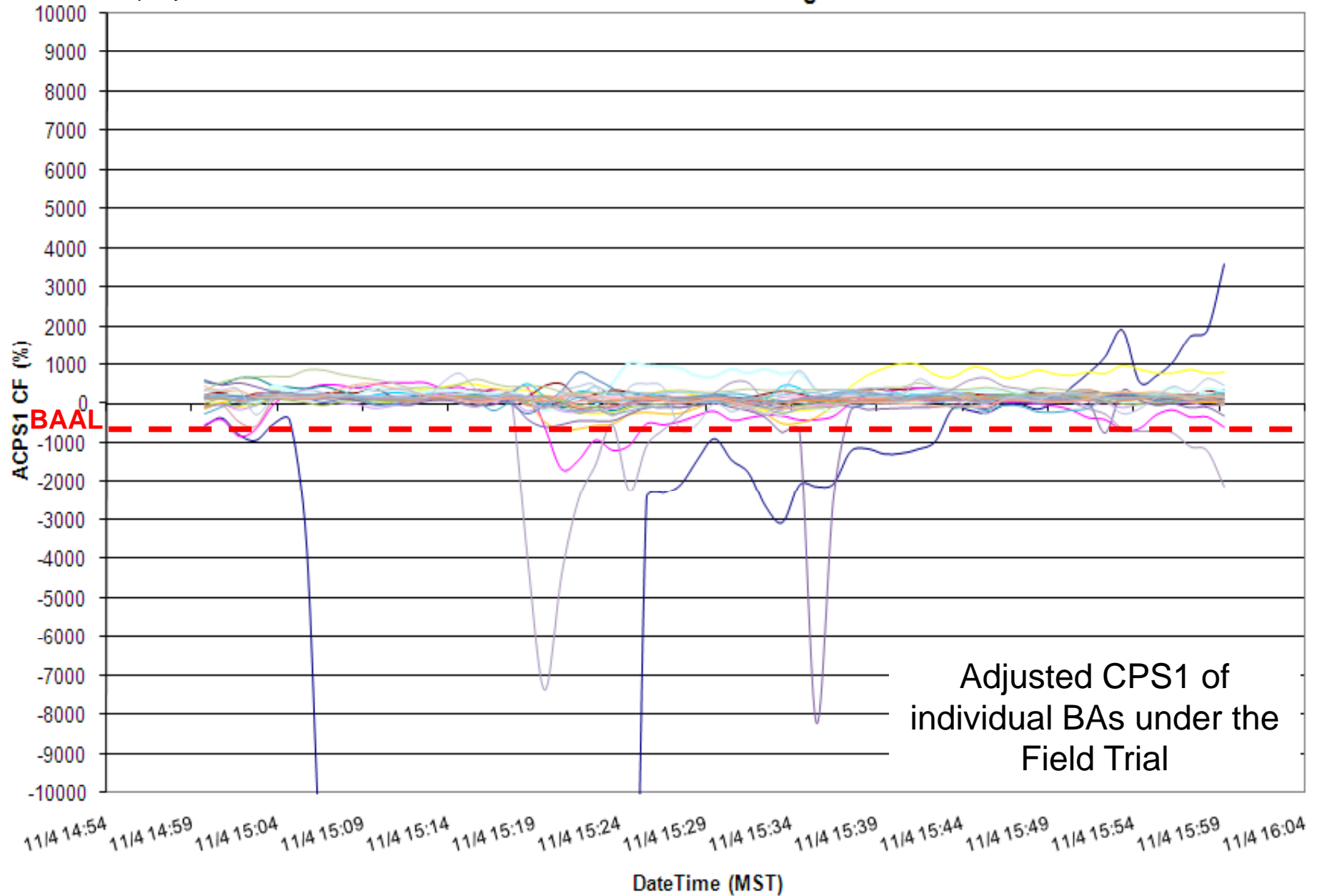
Clock-minute Actual Frequency of Participants

11/04/2010 ending 15:44 MST

38 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

ACPS1 Clock-Minute Averages

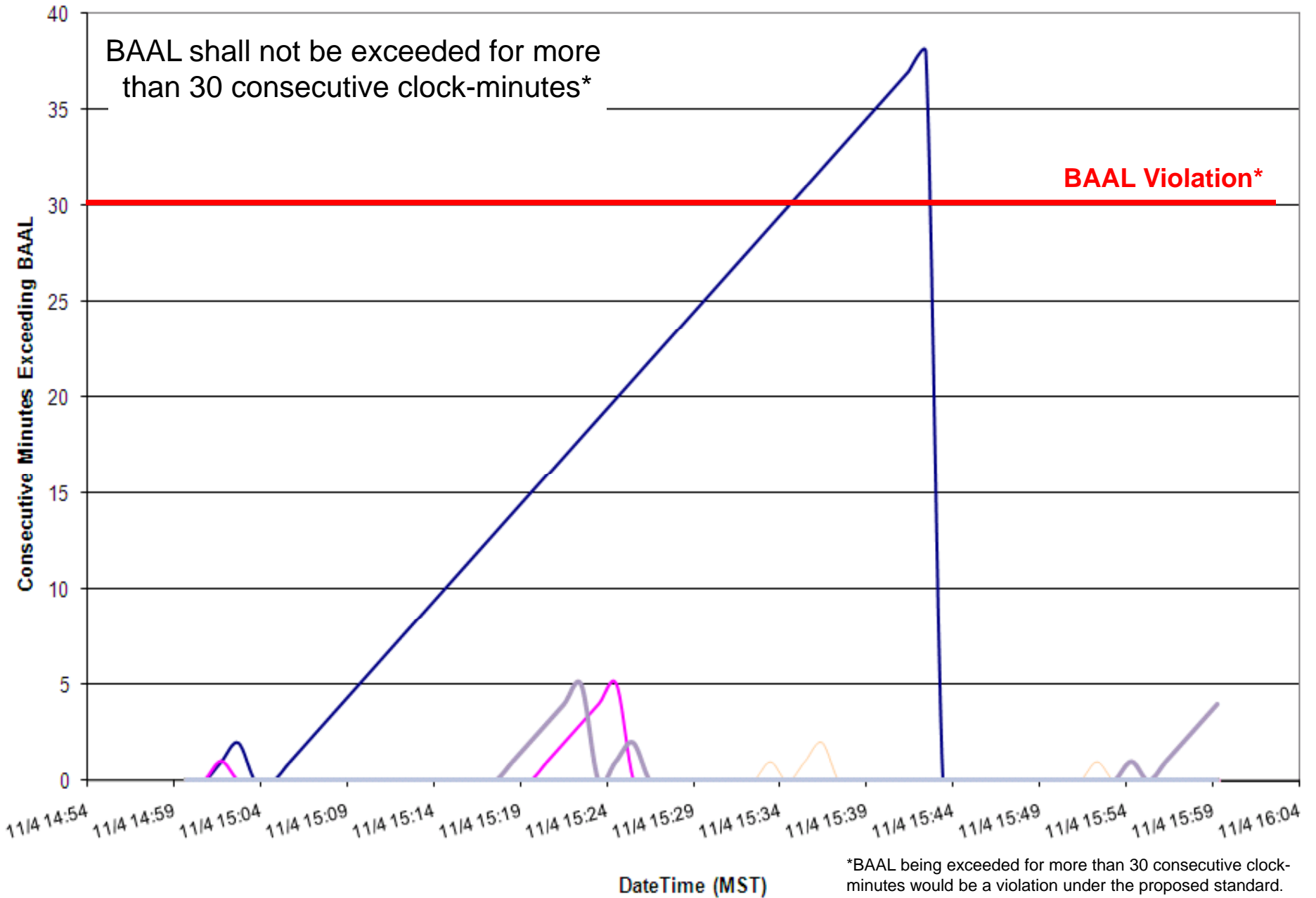


11/04/2010 ending 15:44 MST

38 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

Consecutive Minutes Exceeding BAAL



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

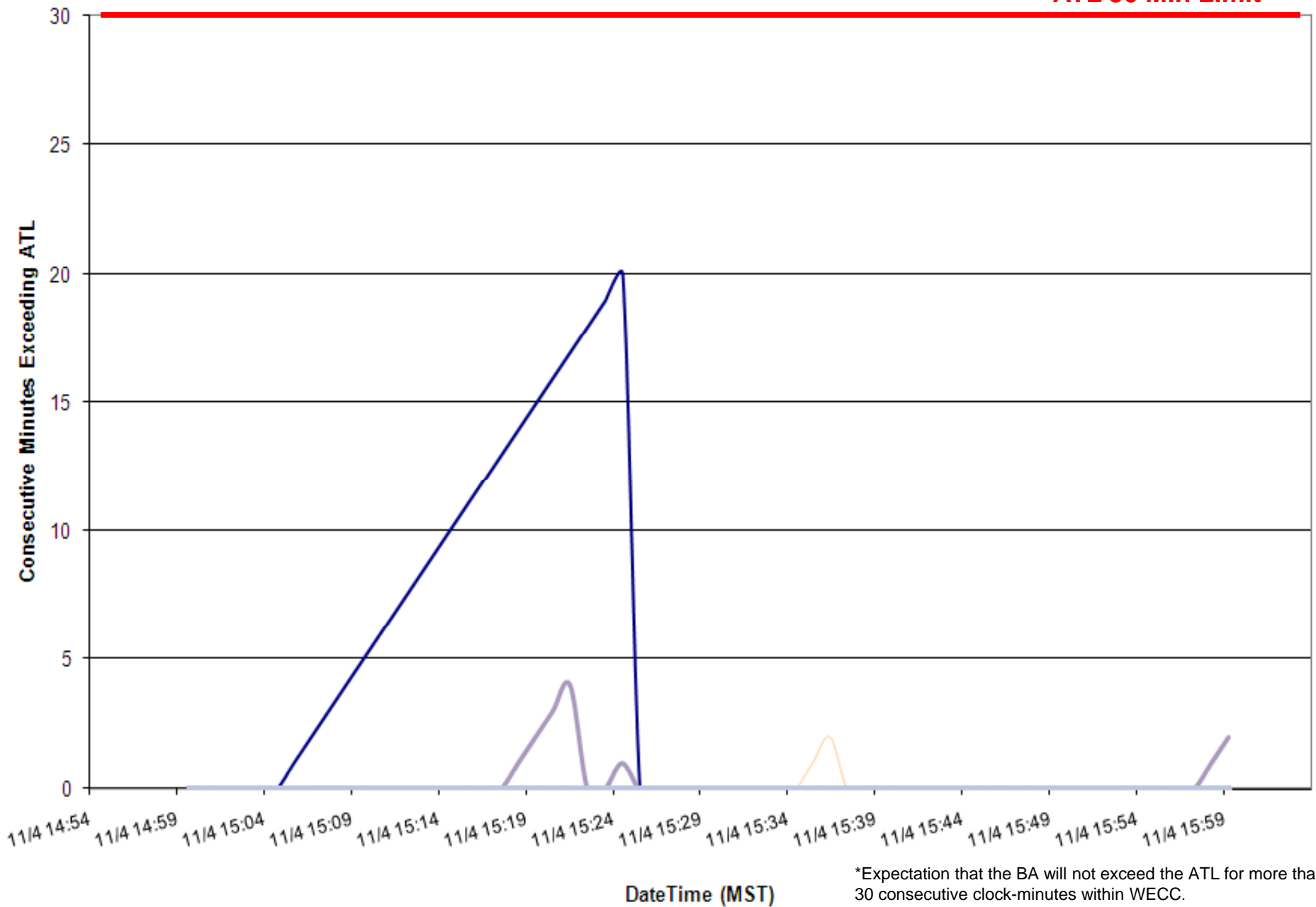
11/04/2010 ending 15:44 MST

38 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

Consecutive Minutes Exceeding ATL

ATL 30 Min Limit



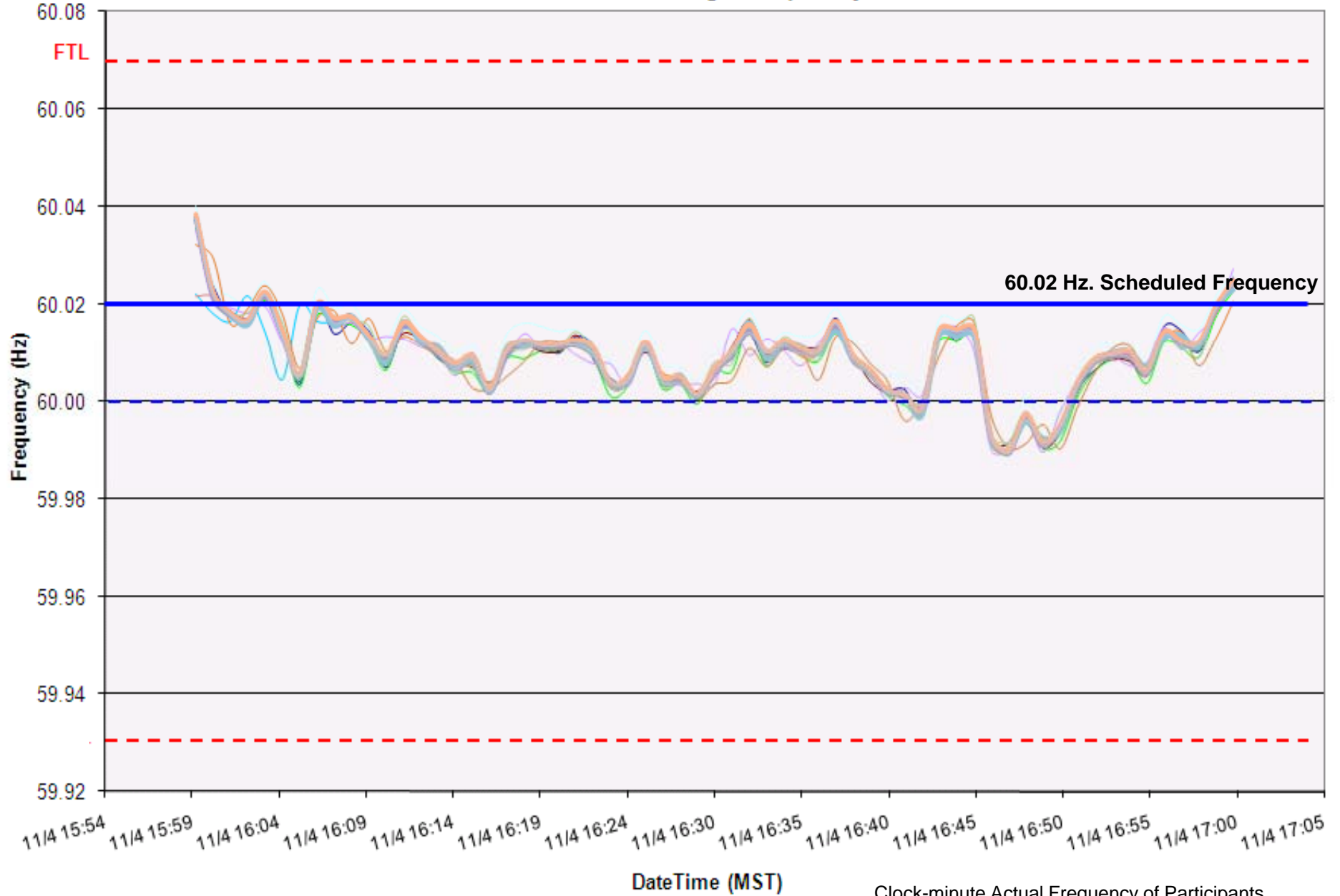
*Expectation that the BA will not exceed the ATL for more than 30 consecutive clock-minutes within WECC.

11/04/2010 ending 16:40 MST

33 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

Clock-Minute Average Frequency

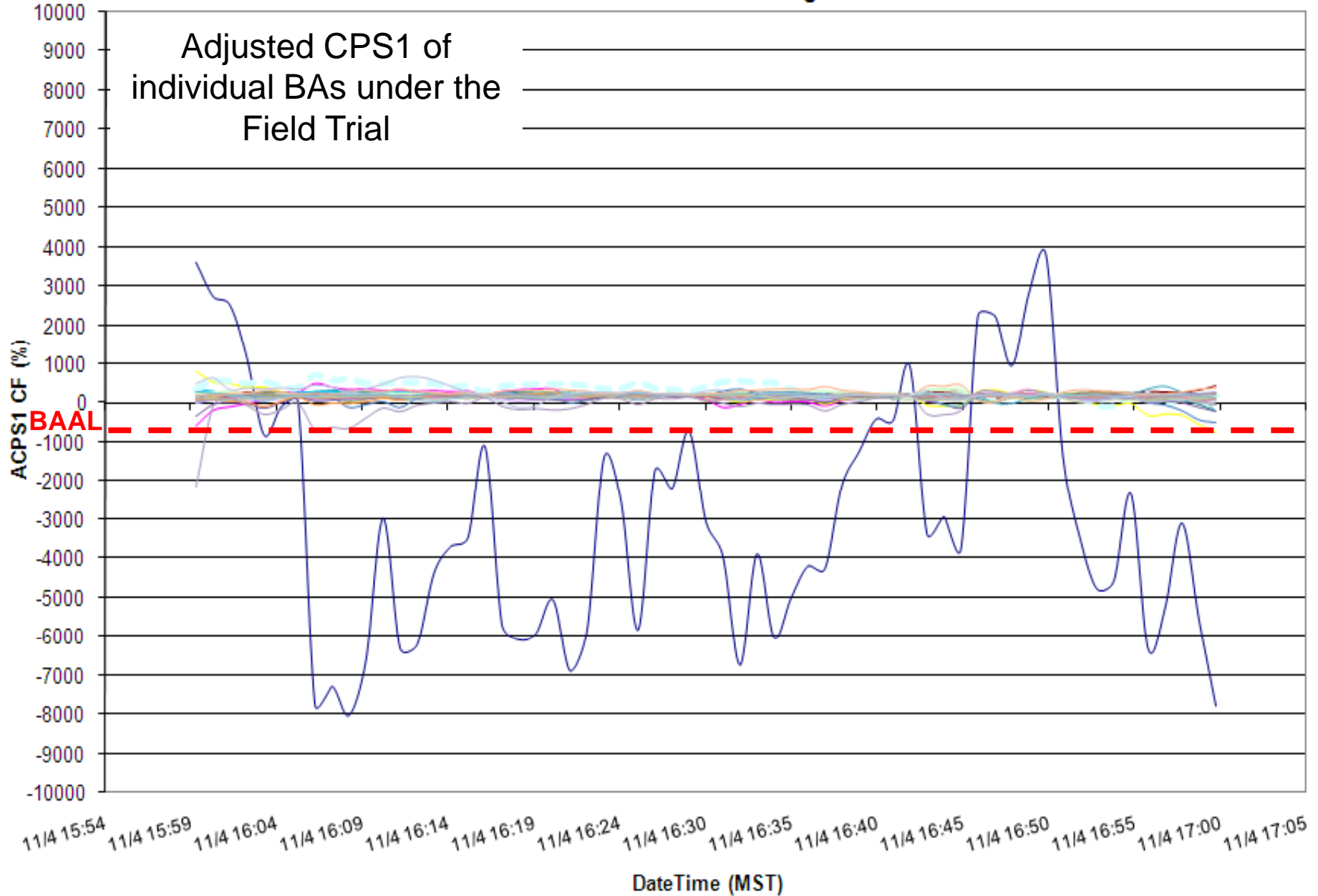


11/04/2010 ending 16:40 MST

33 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

ACPS1 Clock-Minute Averages

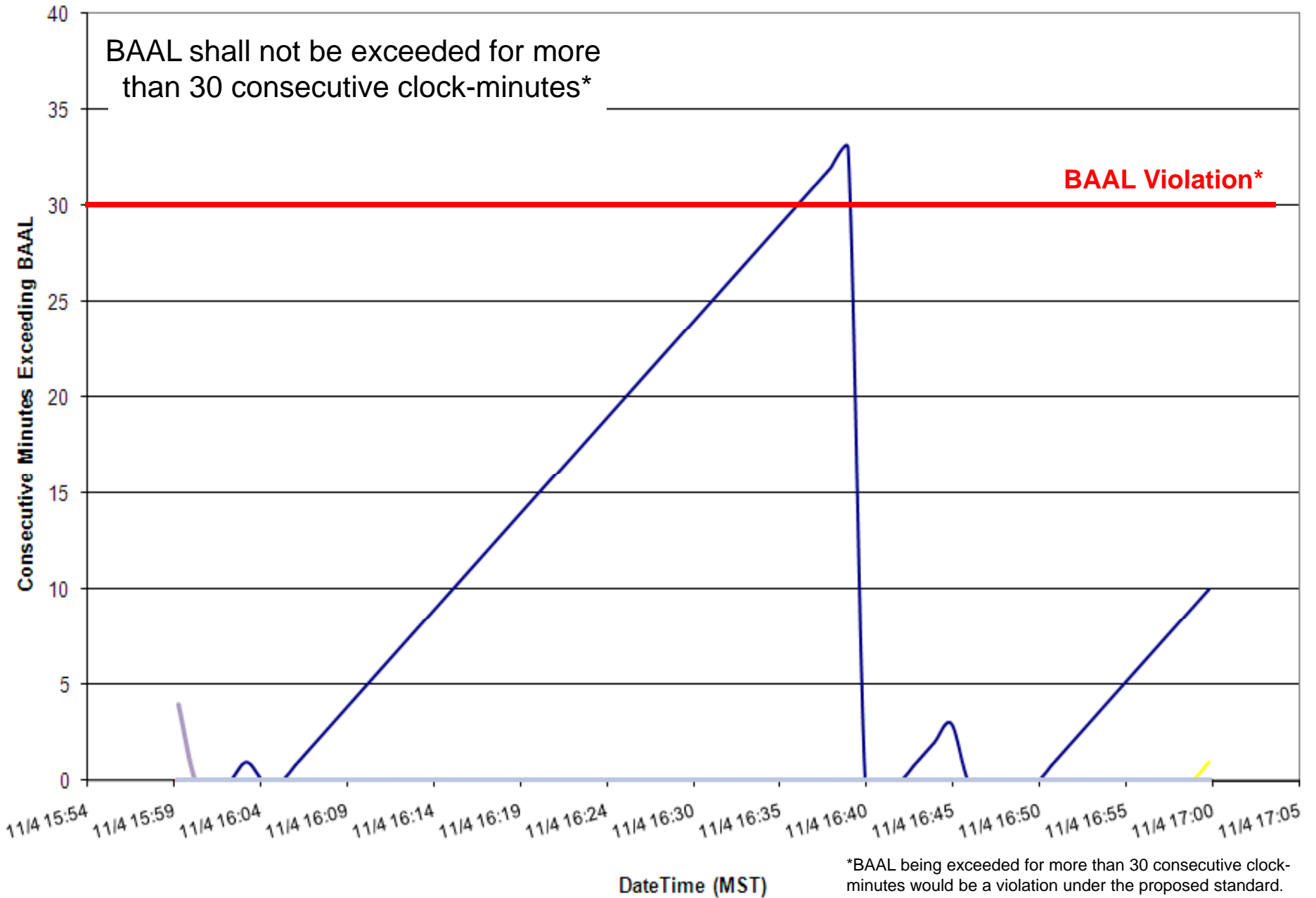


11/04/2010 ending 16:40 MST

33 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

Consecutive Minutes Exceeding BAAL



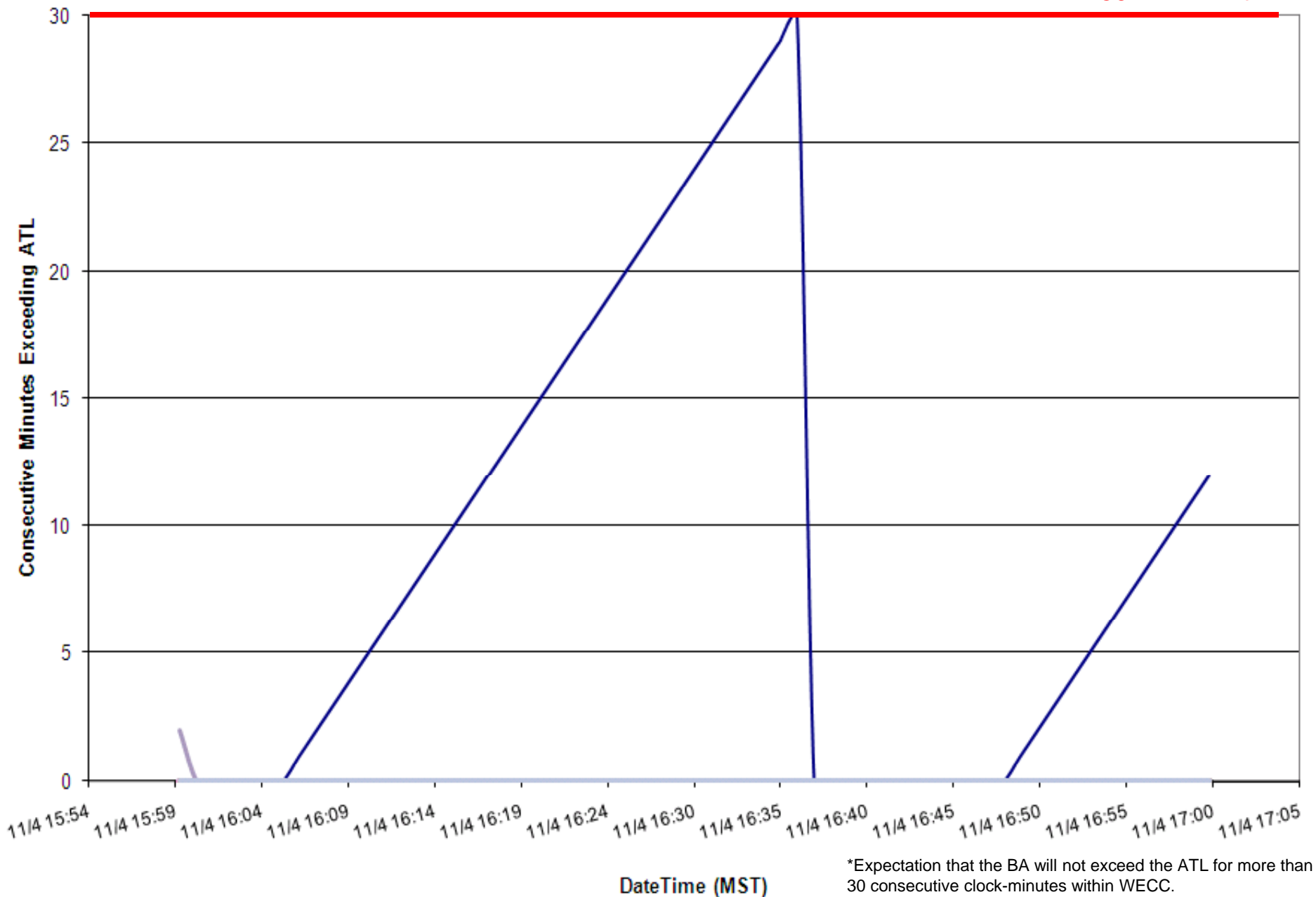
11/04/2010 ending 16:40 MST

33 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

Consecutive Minutes Exceeding ATL

ATL 30 Min Limit*



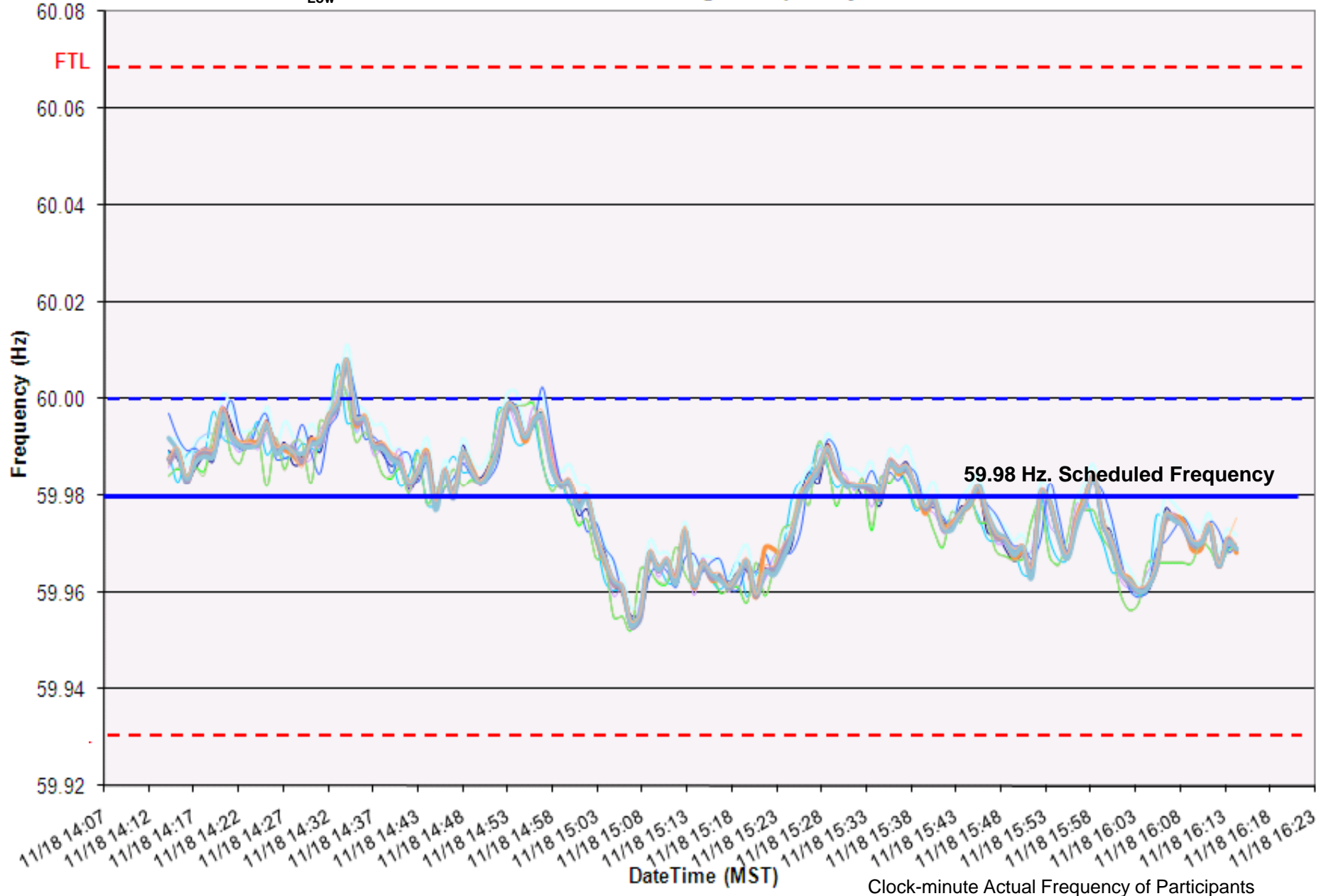
*Expectation that the BA will not exceed the ATL for more than 30 consecutive clock-minutes within WECC.

11/18/2010 ending 16:05 MST

69 minute duration below BAAL_{Low}

114 minute duration below ATL_{Low}

Clock-Minute Average Frequency

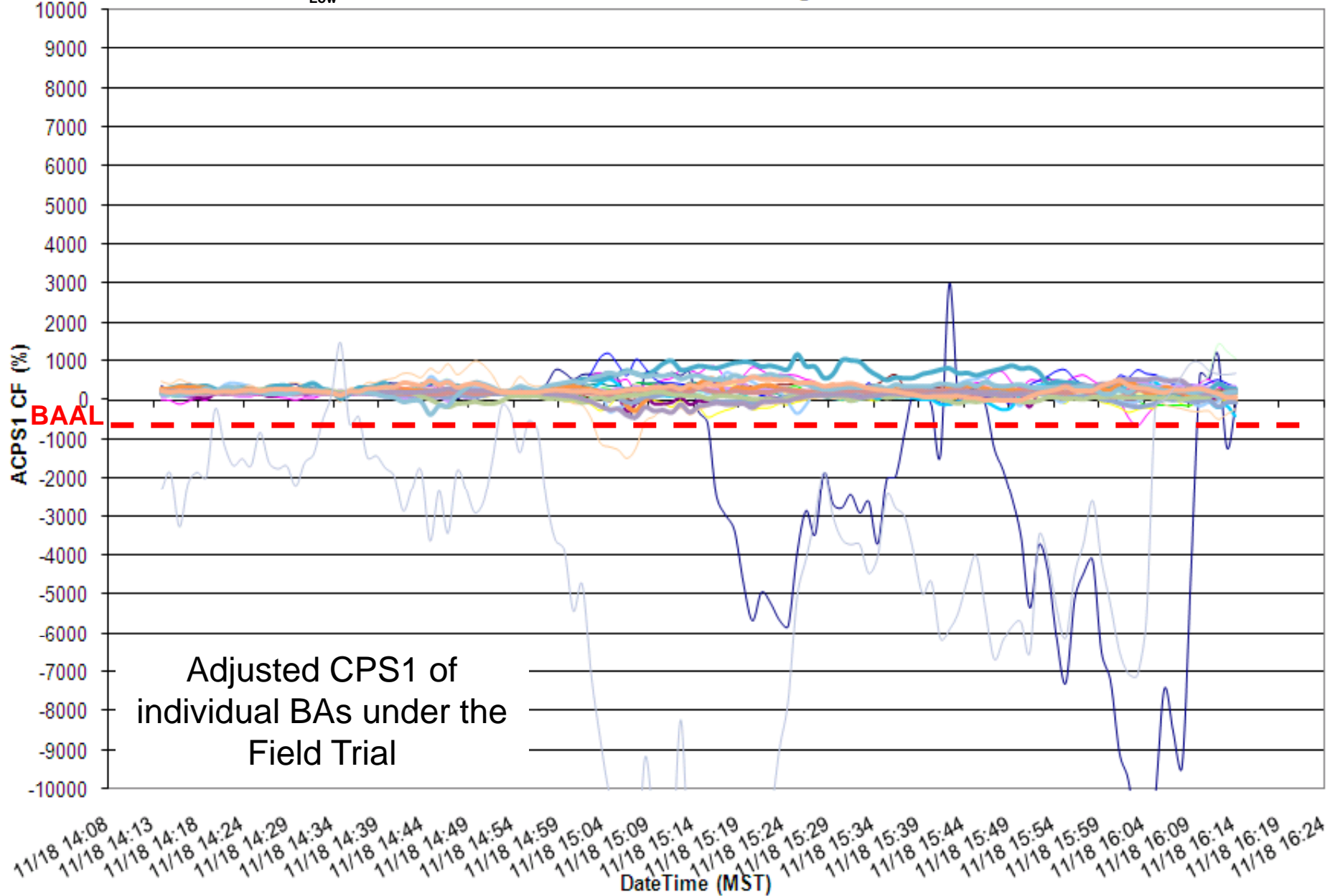


11/18/2010 ending 16:05 MST

69 minute duration below BAAL_{Low}

114 minute duration below ATL_{Low}

ACPS1 One-Minute Averages

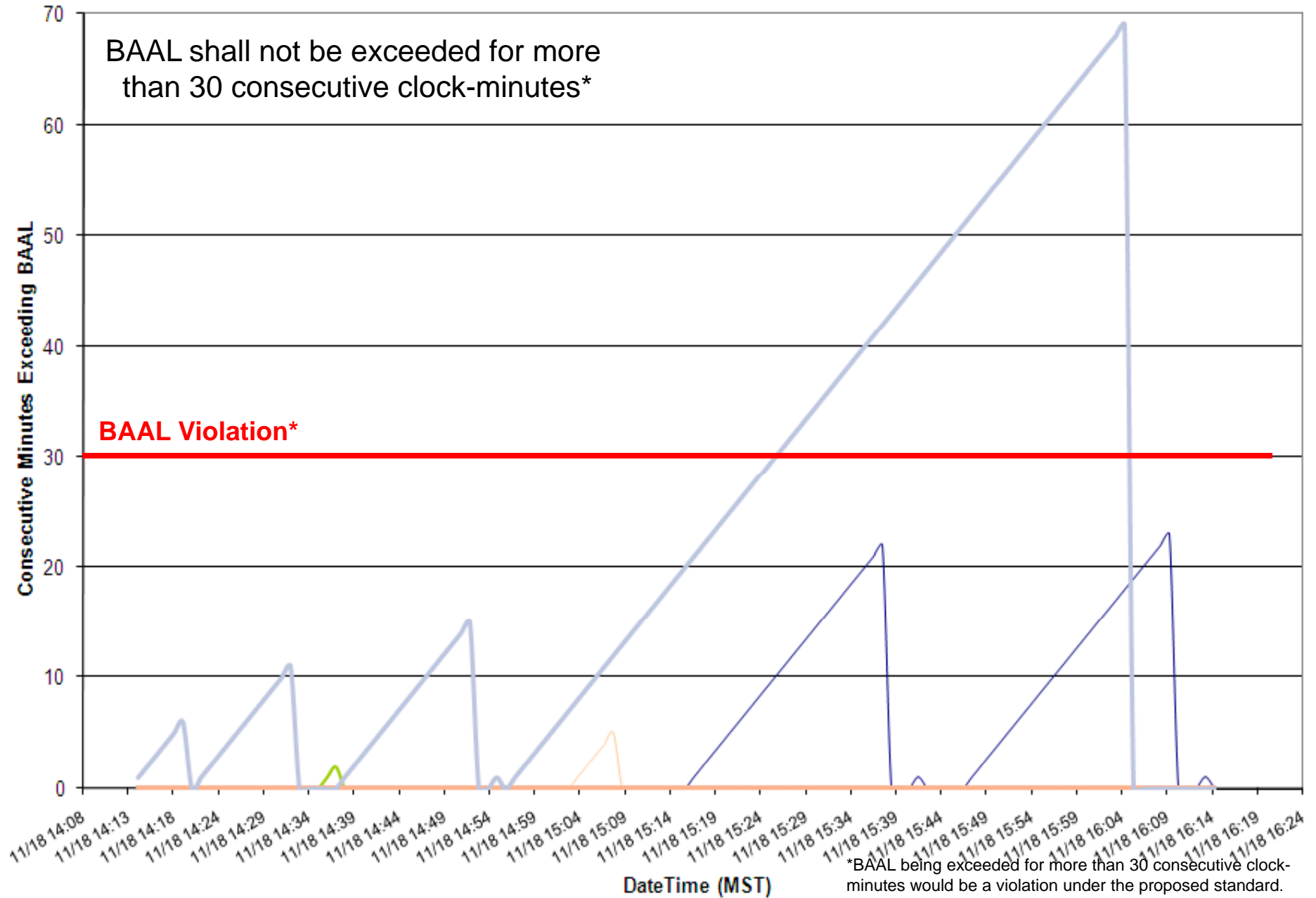


11/18/2010 ending 16:05 MST

69 minute duration below BAAL_{Low}

114 minute duration below ATL_{Low}

Consecutive Minutes Exceeding BAAL

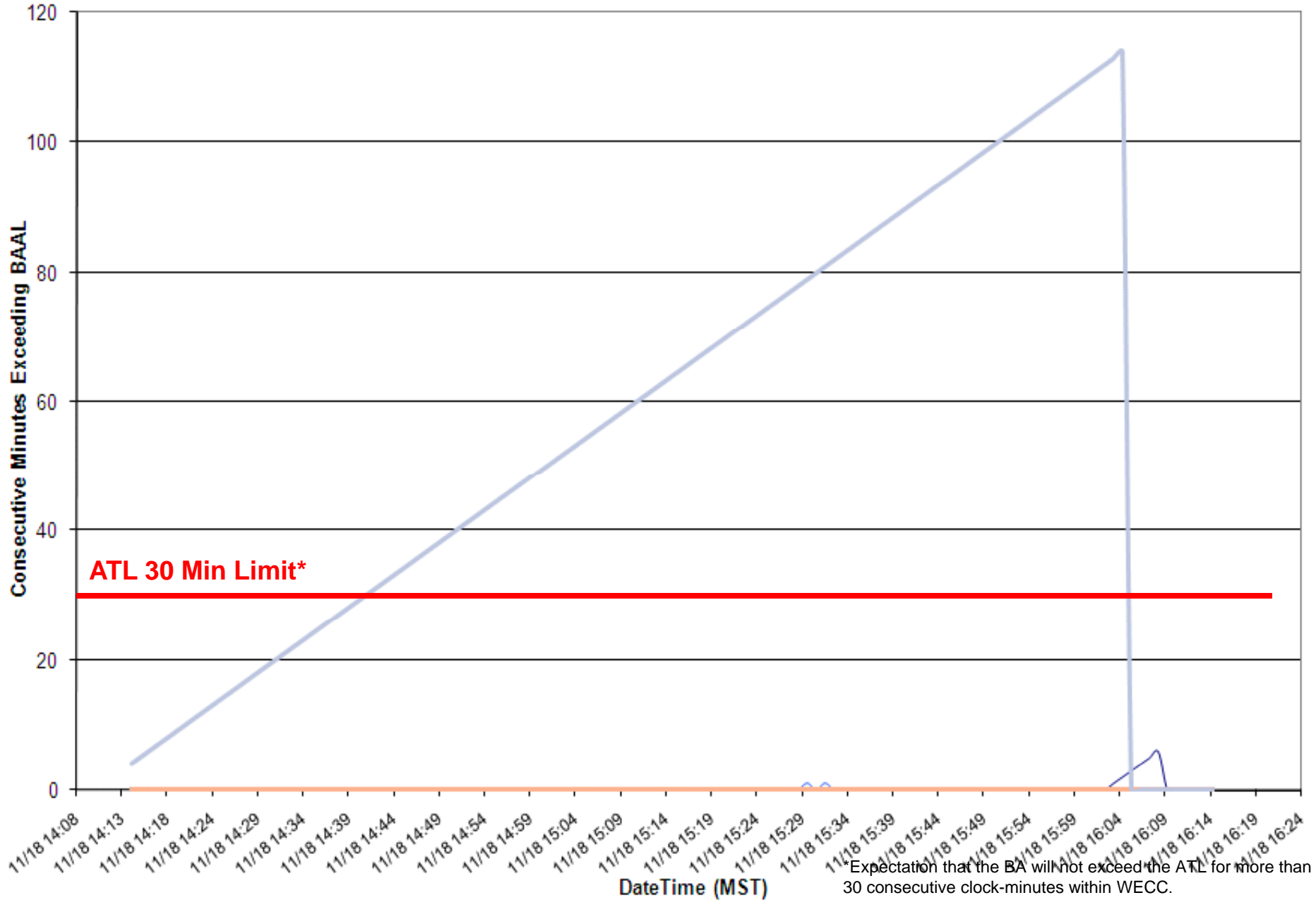


11/18/2010 ending 16:05 MST

69 minute duration below BAAL_{Low}

114 minute duration below ATL_{Low}

Consecutive Minutes Exceeding BAAL

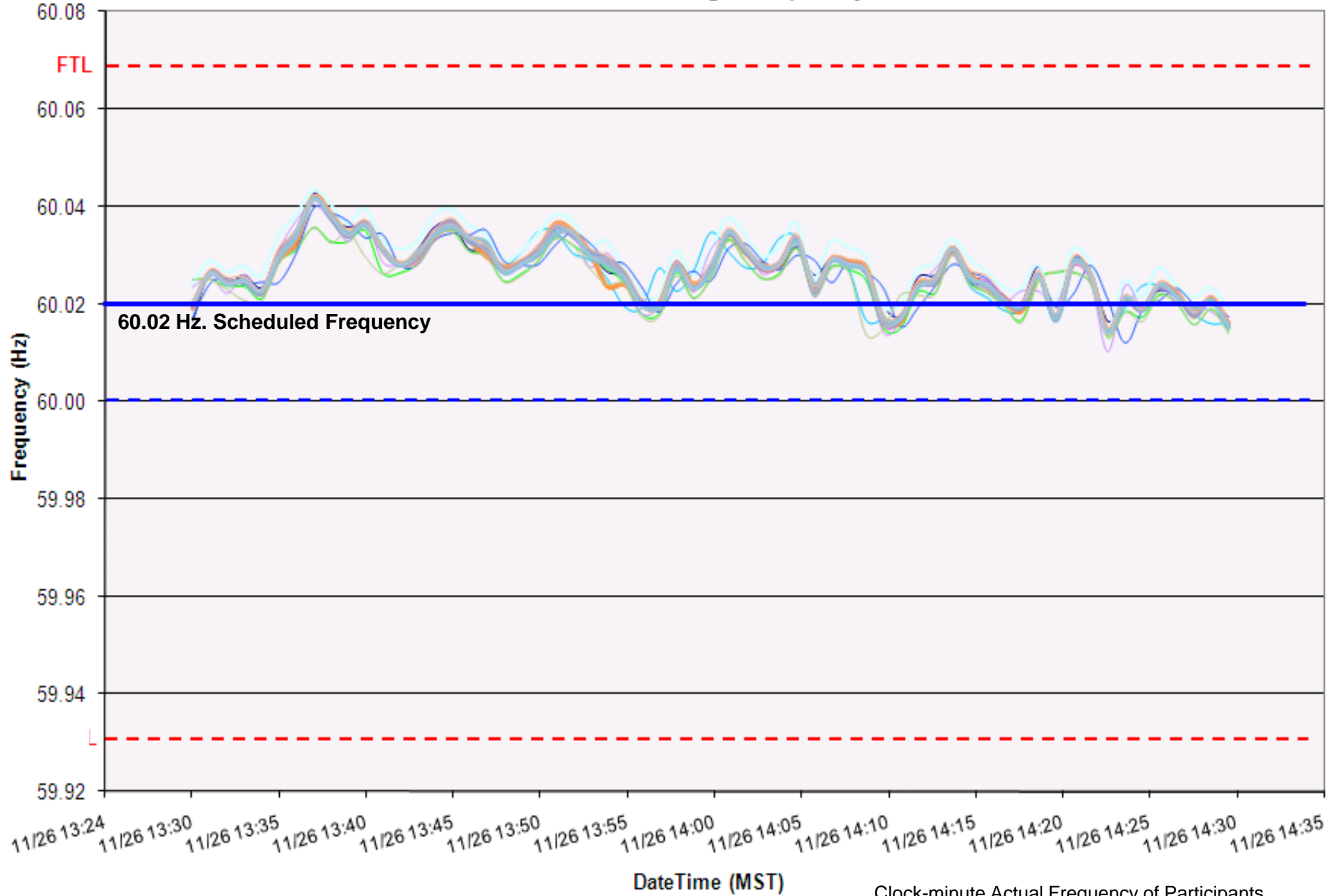


11/262010 ending 14:07 MST

42 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

Clock-Minute Average Frequency



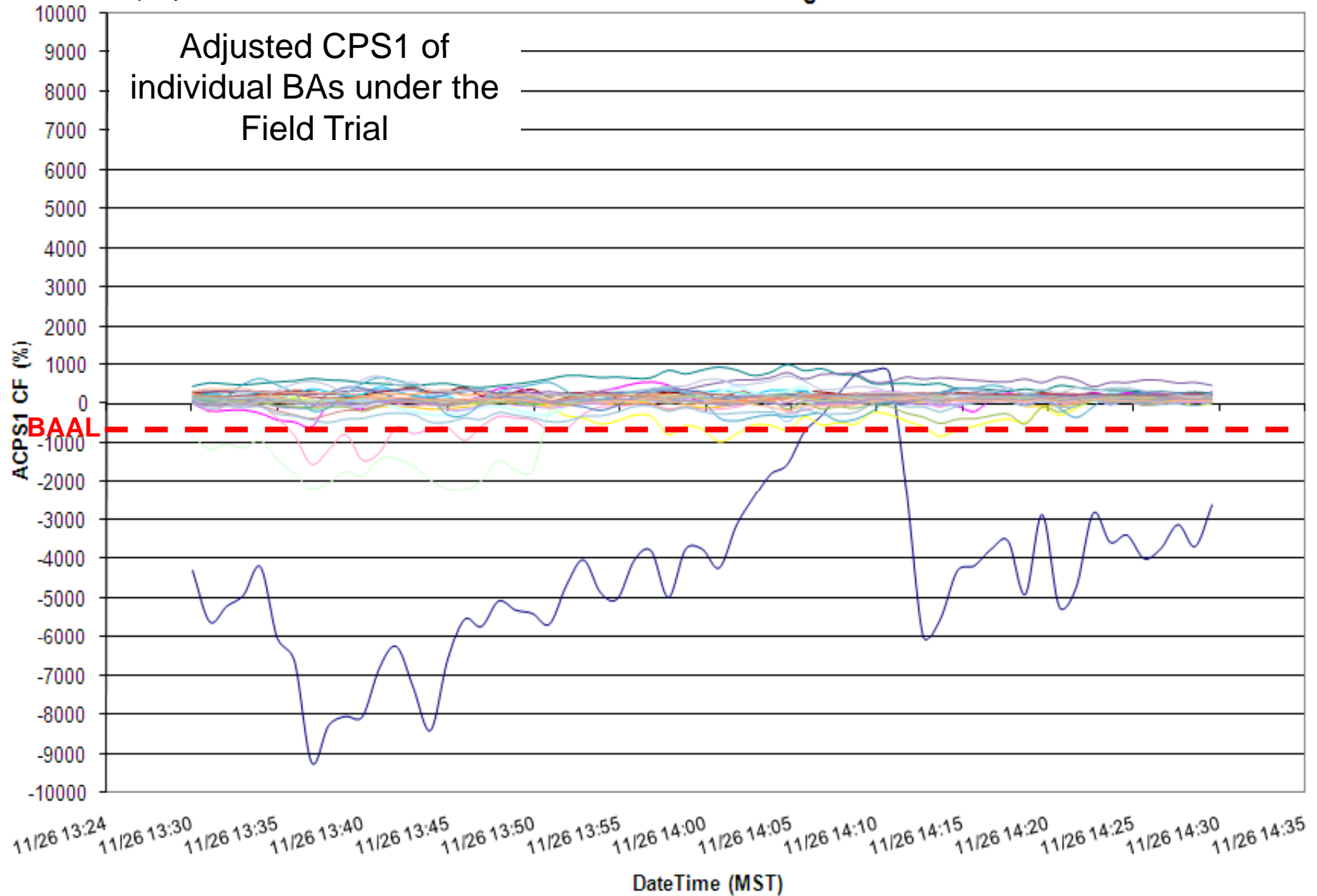
Clock-minute Actual Frequency of Participants

11/262010 ending 14:07 MST

42 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

ACPS1 Clock-Minute Averages

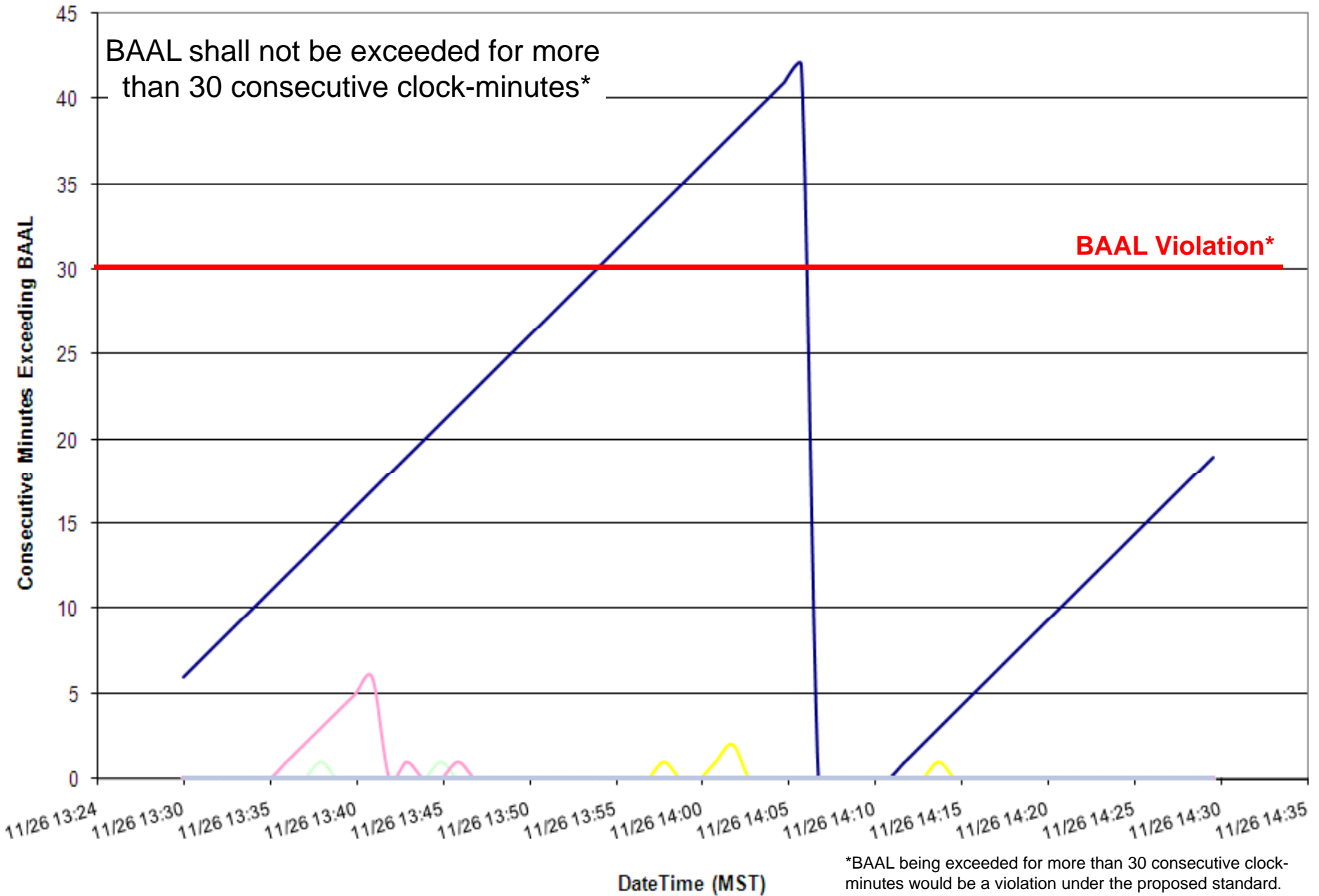


11/262010 ending 14:07 MST

42 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

Consecutive Minutes Exceeding BAAL

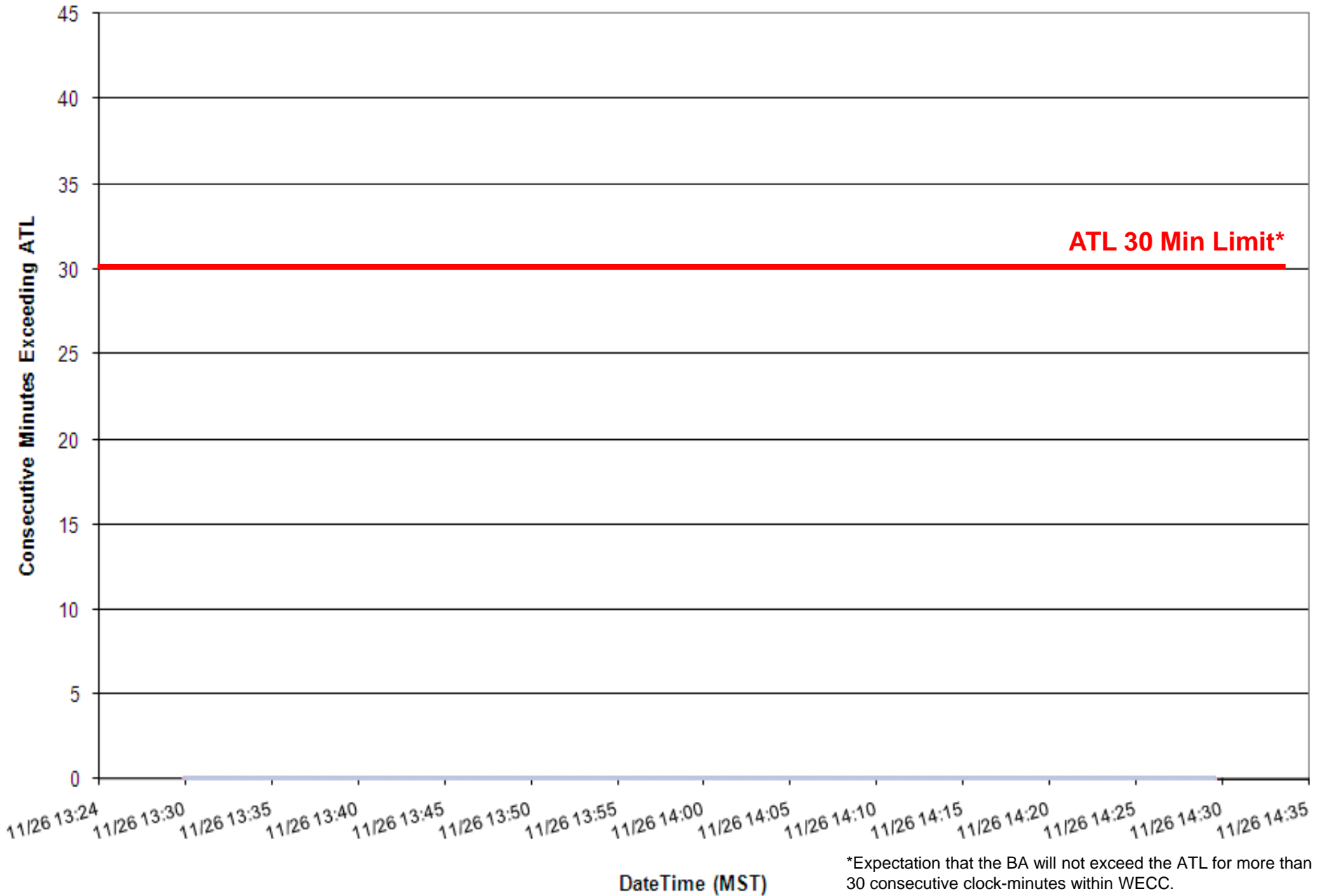


11/262010 ending 14:07 MST

42 minute duration above BAAL_{High}

60.02 Scheduled Frequency TEC.

Consecutive Minutes Exceeding ATL



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

Balancing Authority ACE Limit Proof-of-Concept Field Trial

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

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
ATL High	11/15/10 17:54	11/15/10 18:32	PST	0:38	0	0	17:12 ADS failed resulting in multiple INC dispatches not being received by market participants. 17:25 Generation Dispatchers discovered ADS failure. When ADS returned to service, all previous INC dispatches (MW unknown, but several hundred) were transmitted and Generating Units responded accordingly. Multiple DEC dispatches were sent but Generating Units were slow to
ATL Low	11/11/10 3:24	11/11/10 3:57	PST	33	0	0	on 11/10/10, BA cut-over to a new EMS. On the morning of 11/11/10 there was a problem with transfer of area net schedule data to AGC, preventing its proper functioning. AGC was not functioning at this time.
ATL Low & BAAL Low	11/18/10 13:12	11/18/10 15:05	PST	ATL Low - 114; BAAL Low - 69	0	0	on 11/18/2010, the BA energized first line into XX substation. During the installation of the first line into the substation, it was discovered that there were multiple problems with phasing and metering. This caused the YY Allocator to calculate YY line losses incorrectly. We were calculating ACE with an erroneous negative 400 -700 MW value. It took just over two hours to locate the error. The BA corrected it immediately. The correction then caused the ACE to show as positive 600 MW. This was then corrected by moving all the ZZ units and AA unit down.
ATL High	11/2/10 20:34	11/2/10 21:05	MDT	0:31	0	0	See Note 1 below
ATL High	11/4/10 16:07	11/4/10 16:45	MDT	0:38	0	0	See Note 1 below
BAAL High	11/4/10 16:07	11/4/10 16:45	MDT	0:38	0	0	See Note 2 below
ATL High	11/4/10 17:08	11/4/10 17:41	MDT	0:33	0	0	See Note 1 below
BAAL High	11/4/10 17:08	11/4/10 17:41	MDT	0:33	0	0	See Note 2 below
ATL Low	11/5/10 9:11	11/5/10 10:06	MDT	0:55	0	0	See Note 1 below
ATL Low	11/5/10 11:04	11/5/10 12:00	MDT	0:56	0	0	See Note 1 below
ATL High	11/6/10 3:09	11/6/10 3:46	MDT	0:37	0	0	See Note 1 below

Balancing Authority ACE Limit Proof-of-Concept Field Trial

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

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
See Note 3 for the following:							
BAAL High	11/26/10 13:26	11/26/10 14:08	MDT	0:42	0	0	Operator Error/Failure: The operator misunderstood or misinterpreted a communication from the marketing entity such that he believed he had an additional 20 MW of outgoing interchange schedules. The operator set the plant maximum limits (caps) 20 MW higher than they should have been as a result of his misinterpretation and failed to verify the additional interchange schedules in OATI. Wind speeds were high and consistent, so the operator ASSUMED his cap limits would keep his ACE within BAAL and he neglected to adequately monitor the BAAL counter. The operator in question has been temporarily reassigned to duties off of the wind desk, pending additional training.
ATL High* (see note 3 below)	11/26/10 13:26	11/26/10 14:08	MDT	0:42	0	0	Operator Error/Failure: The operator misunderstood or misinterpreted a communication from the marketing entity such that he believed he had an additional 20 MW of outgoing interchange schedules. The operator set the plant maximum limits (caps) 20 MW higher than they should have been as a result of his misinterpretation and failed to verify the additional interchange schedules in OATI. Wind speeds were high and consistent, so the operator ASSUMED his cap limits would keep his ACE within BAAL and he neglected to adequately monitor the BAAL counter. The operator in question has been temporarily reassigned to duties off of the wind desk, pending additional training.

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

Discussion

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