

Balancing Authority ACE Limit Proof-of-Concept Field Trial

Update Discussion
June 19, 2008

Doug Hils

Reliability-Based Control Standard Drafting Team

Balancing Authority ACE Limit Proof-of-Concept Field Trial

Balancing Authority Participants - Eastern Interconnection	2008 Bias (MW/0.1Hz)	Region	Reliability Coordinator	Start Date
Alliant Energy (ALTE)	-42	MRO	MISO	July 6, 2005
Alliant Energy (ALTW)	-57	MRO	MISO	July 6, 2005
American Electric Power (CSW)	-101.9	SPP	SPP	September 1, 2005
Duke Energy (CIN)	-136	RFC	MISO	July 6, 2005
East Kentucky Power Cooperative (EKPC)	-37.9	SERC	TVA	July 6, 2005
Entergy (EES)	-222.4	SERC	ICTE	July 6, 2005
E.ON U.S. (LGEE)	-92	SERC	TVA	April 1, 2008
Independent Electricity System Operator (IESO)	-303	NPCC	IESO	March 1, 2008
Manitoba Hydro (MHEB)	-43.9	MRO	MISO	July 6, 2005
Michigan Electric Coordinated Systems (MECS)	-233	RFC	MISO	September 1, 2005
Northern Indiana Public Service (NIPS)	-59	RFC	MISO	July 6, 2005
PJM Interconnection (PJM)	-1418	RFC	PJM	August 1, 2005
Santee Cooper (SC)	-88.3	SERC	VACS	March 1, 2006
Southern Company (SOCO)	-463	SERC	SOCO	October 15, 2005
Tennessee Valley Authority (TVA)	-328.32	SERC	TVA	October 1, 2005
We Energies (WEC)	-73	RFC	MISO	September 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*

	JULY '05 - MAY '08 Performance under BAL-007		MAY 2008 Performance under BAL-007	
	Max MinCtLow	Max MinCtHigh	Max MinCtLow	Max MinCtHigh
BA01	9	7	6	6
BA02	7	13	8	10
BA03	13	15	6	5
BA04	26	16	5	5
BA05	20	16	7	6
BA06	17	18	13	12
BA07	16	22	7	10
BA08	26	23	13	10
BA09	33	24	9	8
BA10	28	26	21	14
BA11	32	29	Information needs to be updated	
BA12	25	31	13	11
BA13	27	33	9	13
BA14	22	38	7	11
BA15	27	40	9	18
BA16	28	43	18	16

MinCtLow = Count of consecutive clock-minutes BAAL_Low was exceeded

MinCtHigh = Count of consecutive clock-minutes BAAL_High was exceeded

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

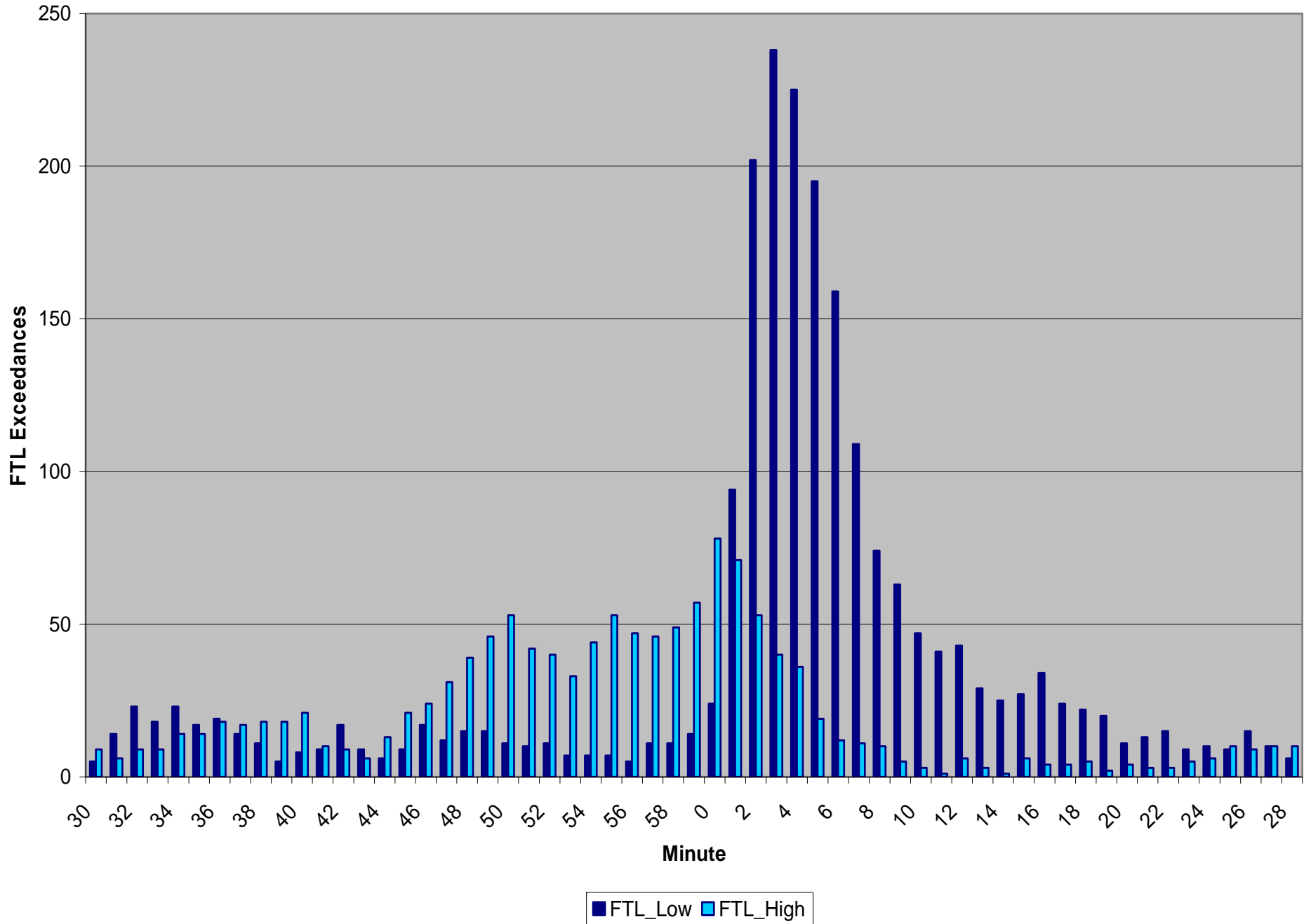
Clock-Minutes of Actual Frequency <= FTL_Low												
Year	Month	>=1 Min	>=2 Min	>=3 Min	>=4 Min	>=5 Min	>=6 Min	>=7 Min	>=8 Min	>=9 Min	>=10 Min	Max_Duration
2005	7	32	14	7	3	2						5
2005	8	56	36	20	12	8	2	1	1	1	1	10
2005	9	33	20	9	4	2	1	1	1			8
2005	10	43	21	12	5	2	2	1	1	1	1	11
2005	11	58	26	14	5	4	1					6
2005	12	41	18	5	4	2	2	1				7
2006	1	43	20	7	2	2	1					6
2006	2	39	17	4	2	1	1					6
2006	3	50	23	4	2							4
2006	4	58	30	10	5	2						5
2006	5	54	30	15	10	4	4	1	1			8
2006	6	41	22	11	4	1						5
2006	7	34	18	9	4	2	1	1	1	1		9
2006	8	50	26	15	8	3						5
2006	9	38	21	11	4	3	1					6
2006	10	51	26	9	6	2	1					6
2006	11	47	22	10	8	4						5
2006	12	34	14	3	1							4
2007	1	44	21	10	7	3	2	1				7
2007	2	33	13	2								3
2007	3	76	39	18	10	3	2	2	1	1	1	15*
2007	4	45	18	7	4	3						5
2007	5	64	32	10	7	3						5
2007	6	48	24	12	6	2	1					6
2007	7	32	19	8	4	2	1					6
2007	8	31	16	9	3	2	1					6
2007	9	41	27	12	6	4	2	2	1			8
2007	10	73	25	15	8	1						5
2007	11	60	23	10	2							4
2007	12	38	13	4	2	1	1					6
2008	1	34	21	11	4	2	1	1	1			8
2008	2	46	27	8	4	1	1	1	1			8
2008	3	55	27	10	7	2	1					6
2008	4	60	28	11	4	3						5
2008	5	63	31	9	3							4
SUM		1645	808	341	170	76	30	13	9	4	3	

This chart lists the number of times that the duration of the FTL_{Low} exceedance was greater than or equal to 1 minute, 2 minutes, 3 minutes and so on, with the maximum duration for the month noted in the right column. *The 15-minute duration in March 2007 was for the Monday morning after the change to the new Daylight Saving Time.

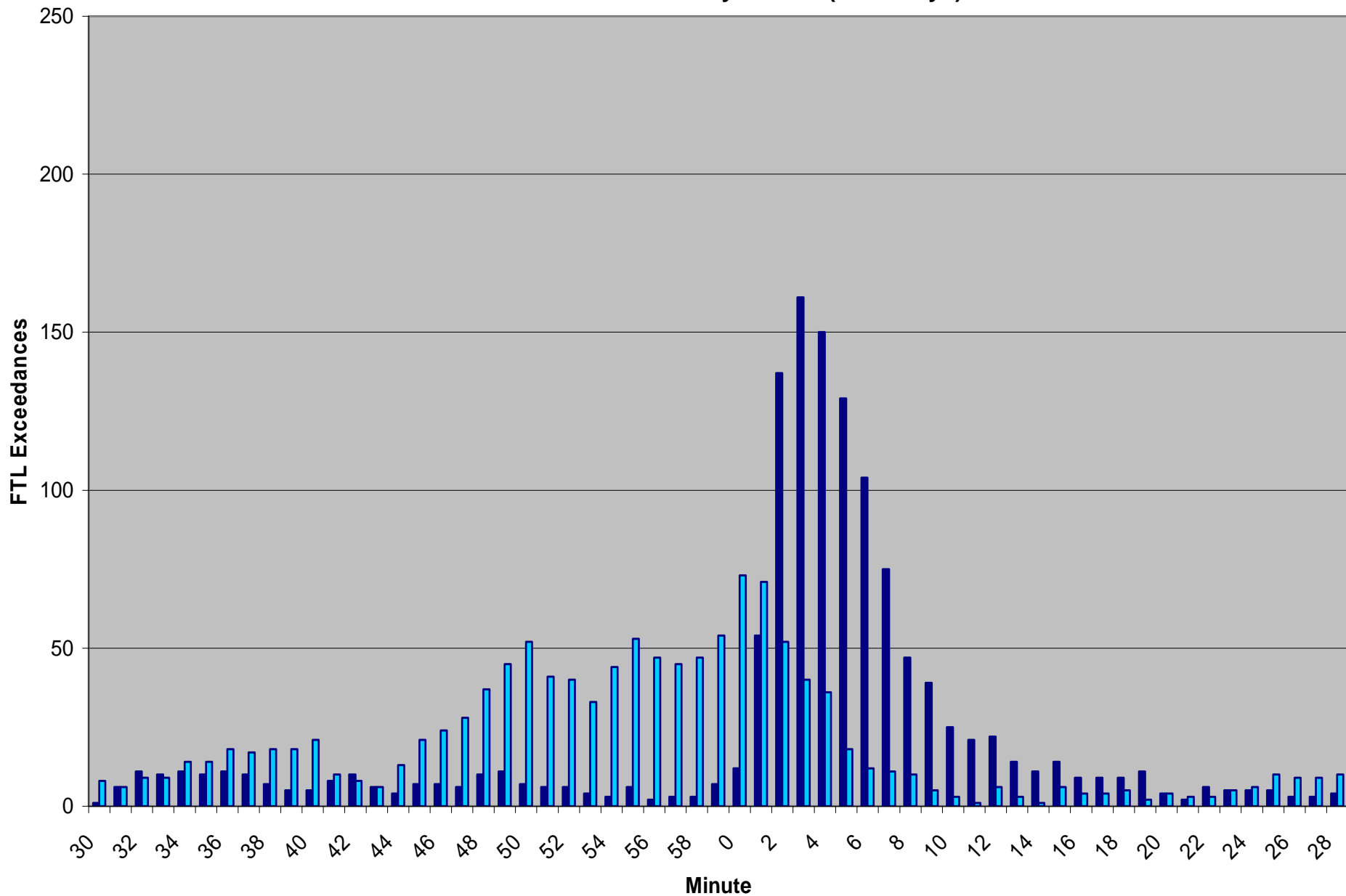
Clock-Minutes of Actual Frequency >= FTL_High												
Year	Month	>=1 Min	>=2 Min	>=3 Min	>=4 Min	>=5 Min	>=6 Min	>=7 Min	>=8 Min	>=9 Min	>=10 Min	Max_Duration
2005	7	11	4	1								3
2005	8	21	7	4	2	1						5
2005	9	21	9	3	2	2	1	1				7
2005	10	23	6	2	1	1						5
2005	11	22	7	4	1	1	1	1				7
2005	12	19	6	2								3
2006	1	27	15	11	6	2						5
2006	2	24	10	7	5							4
2006	3	33	12	4	2	1	1	1	1			8
2006	4	46	22	3	1	1	1	1	1			8
2006	5	39	20	9	4	1						5
2006	6	24	10	7	4	4	3	3	2	1	1	10
2006	7	29	11	8	2							4
2006	8	26	13	10	5	1	1	1	1			8
2006	9	33	14	4	2							4
2006	10	28	14	4	3	2	1	1	1			8
2006	11	22	11	4								3
2006	12	29	12	7	3	2	1					6
2007	1	31	14	5	2	1	1	1				7
2007	2	21	13	4	1							4
2007	3	39	21	10	4	2	1	1	1			8
2007	4	30	15	8	4							4
2007	5	49	20	11	7	4	4	1				7
2007	6	25	14	7	2	1	1	1				7
2007	7	20	12	8	2							4
2007	8	32	14	7	3	2						5
2007	9	17	7	5	2	1						5
2007	10	35	15	3	1	1						5
2007	11	24	7	5	2	1						5
2007	12	38	16	7	2							4
2008	1	24	16	8	1							4
2008	2	24	11	6	3	3	2	1	1			8
2008	3	34	6									2
2008	4	33	12	8	3	3	1					6
2008	5	20	10	6	4	1						5
SUM		973	426	202	86	39	20	14	8	1	1	

This chart lists the number of times that the duration of the FTL_{HIGH} exceedance was greater than or equal to 1 minute, 2 minutes, 3 minutes and so on, with the maximum duration for the month noted in the right column.

Count of FTL Exceedances by Minute (Weekdays)

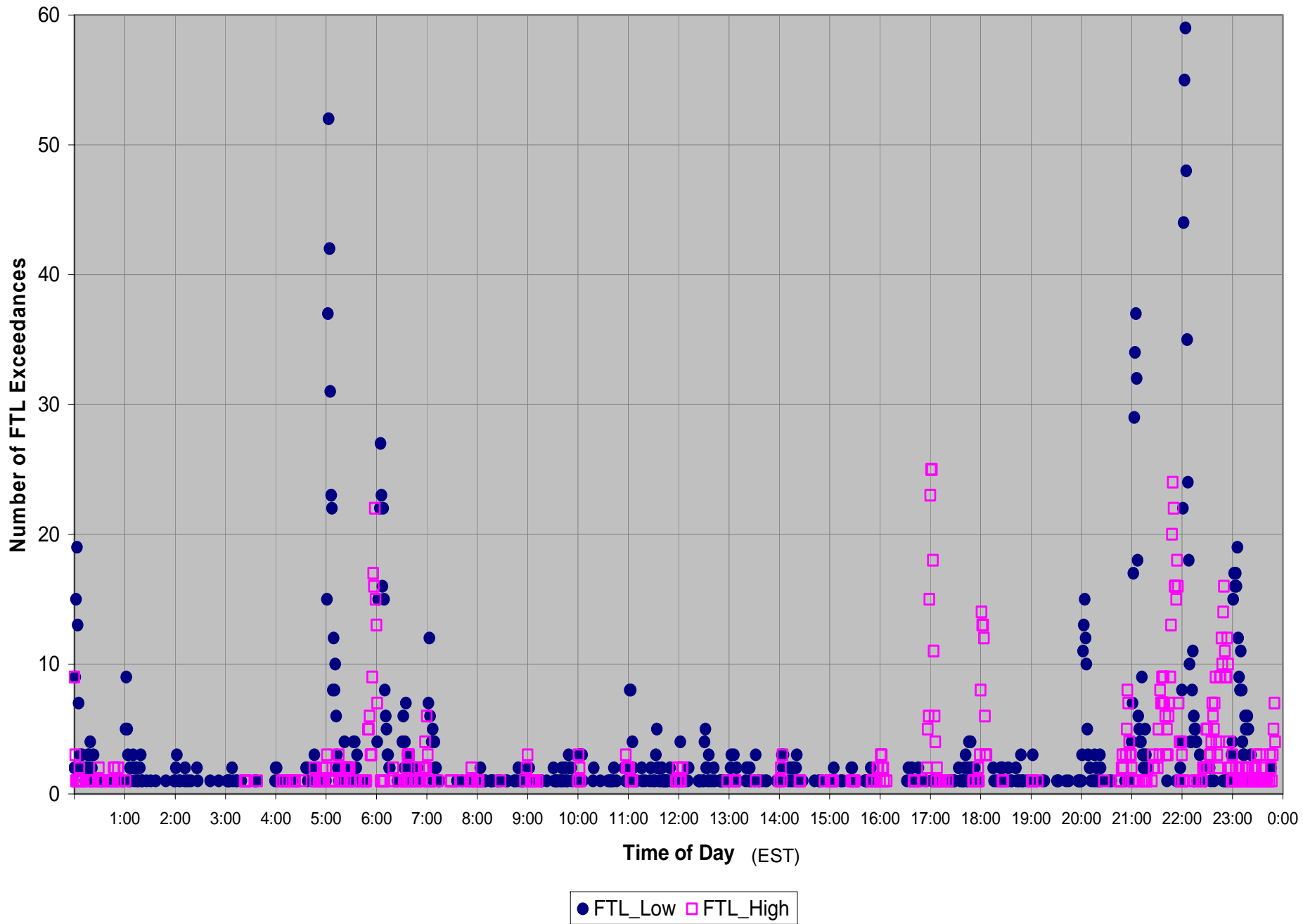


Count of FTL Exceedances by Minute (Weekdays)

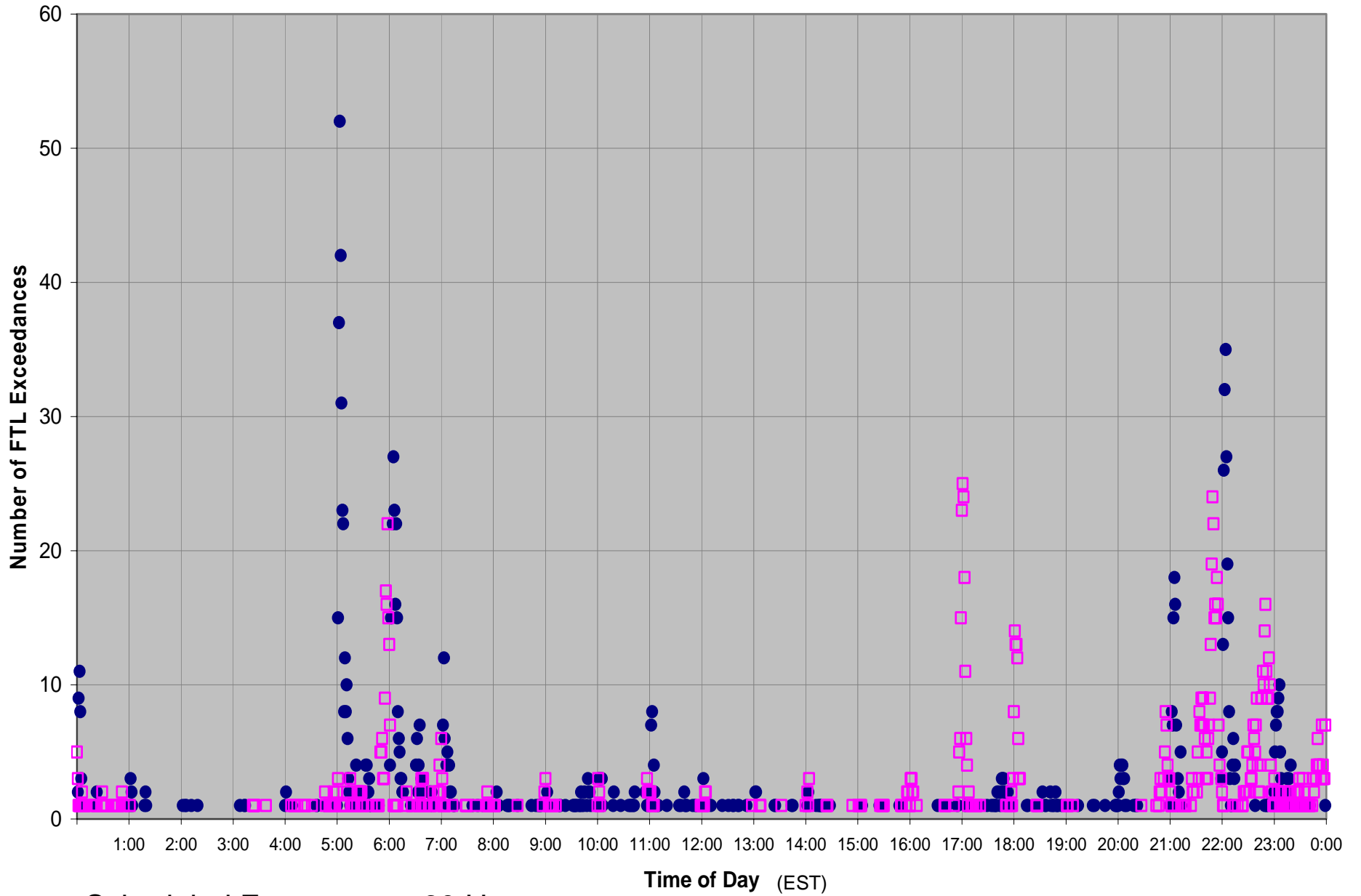


■ FTL_Low ■ FTL_High

Count of Frequency Trigger Limit (FTL) Exceedances (Weekdays)



Count of Frequency Trigger Limit (FTL) Exceedances (Weekdays)



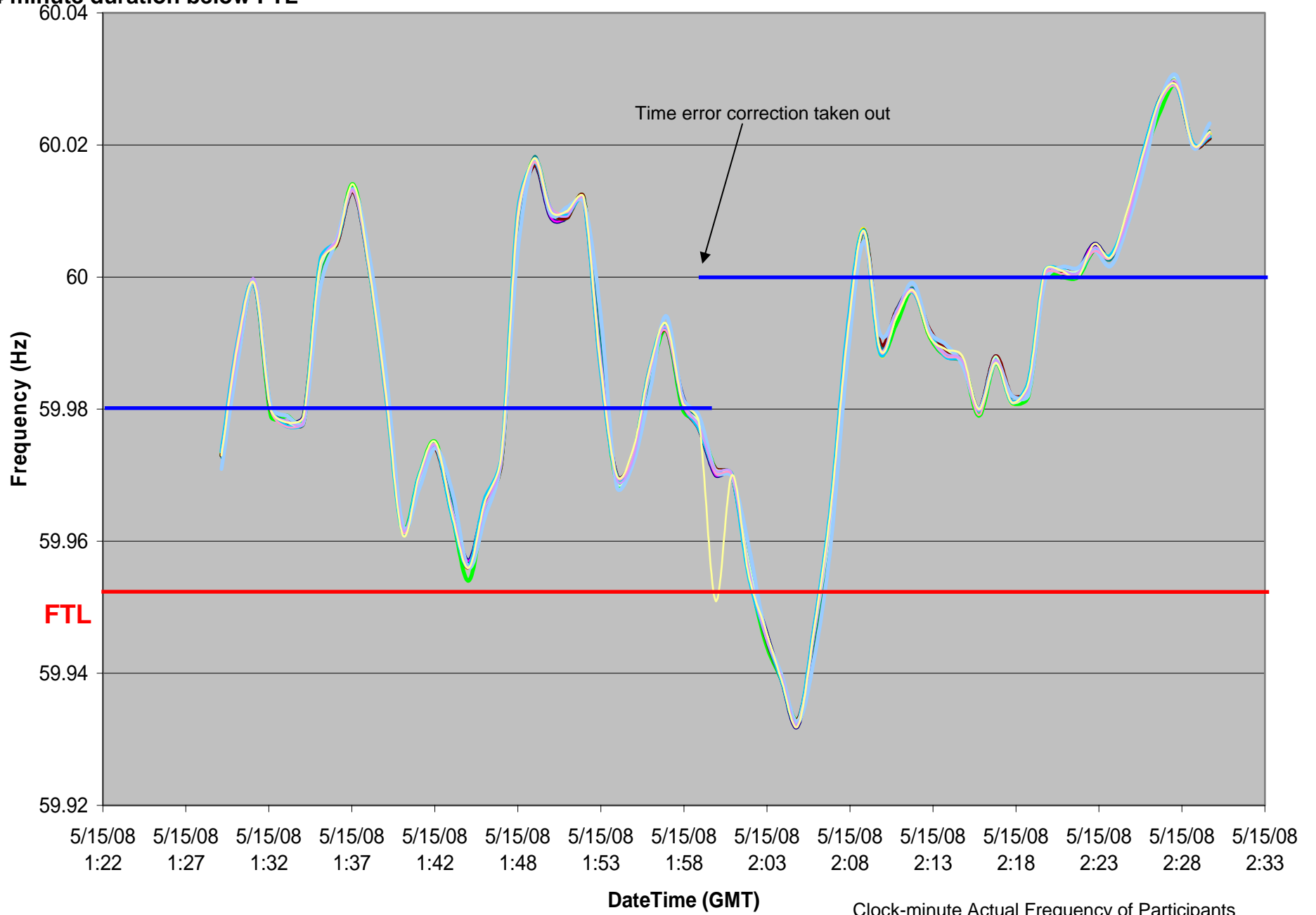
Scheduled Frequency = 60 Hz

● FTL_Low □ FTL_High

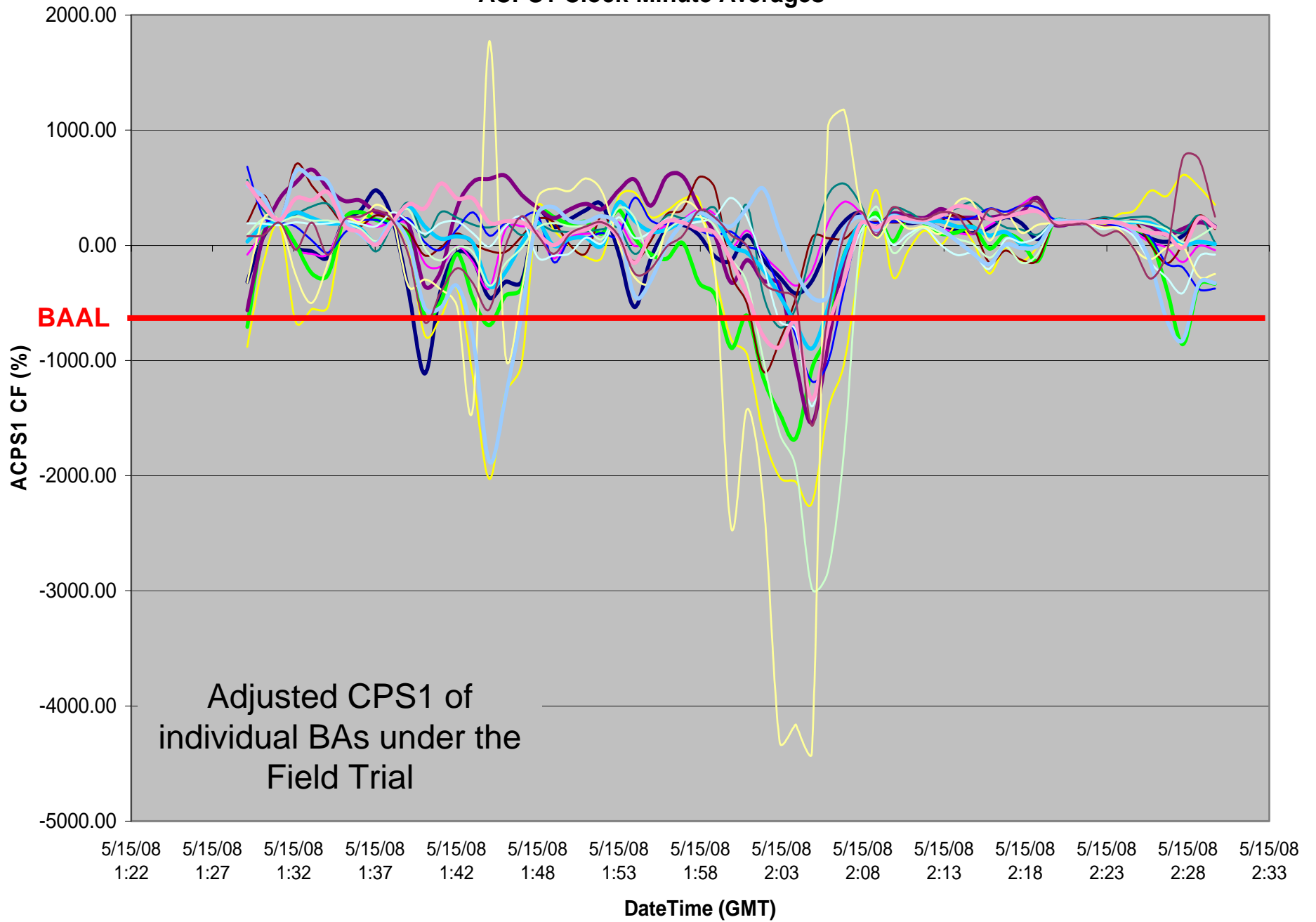
5/14/2008 21:03-21:06 EST

4 minute duration below FTL

Clock-Minute Average Frequency

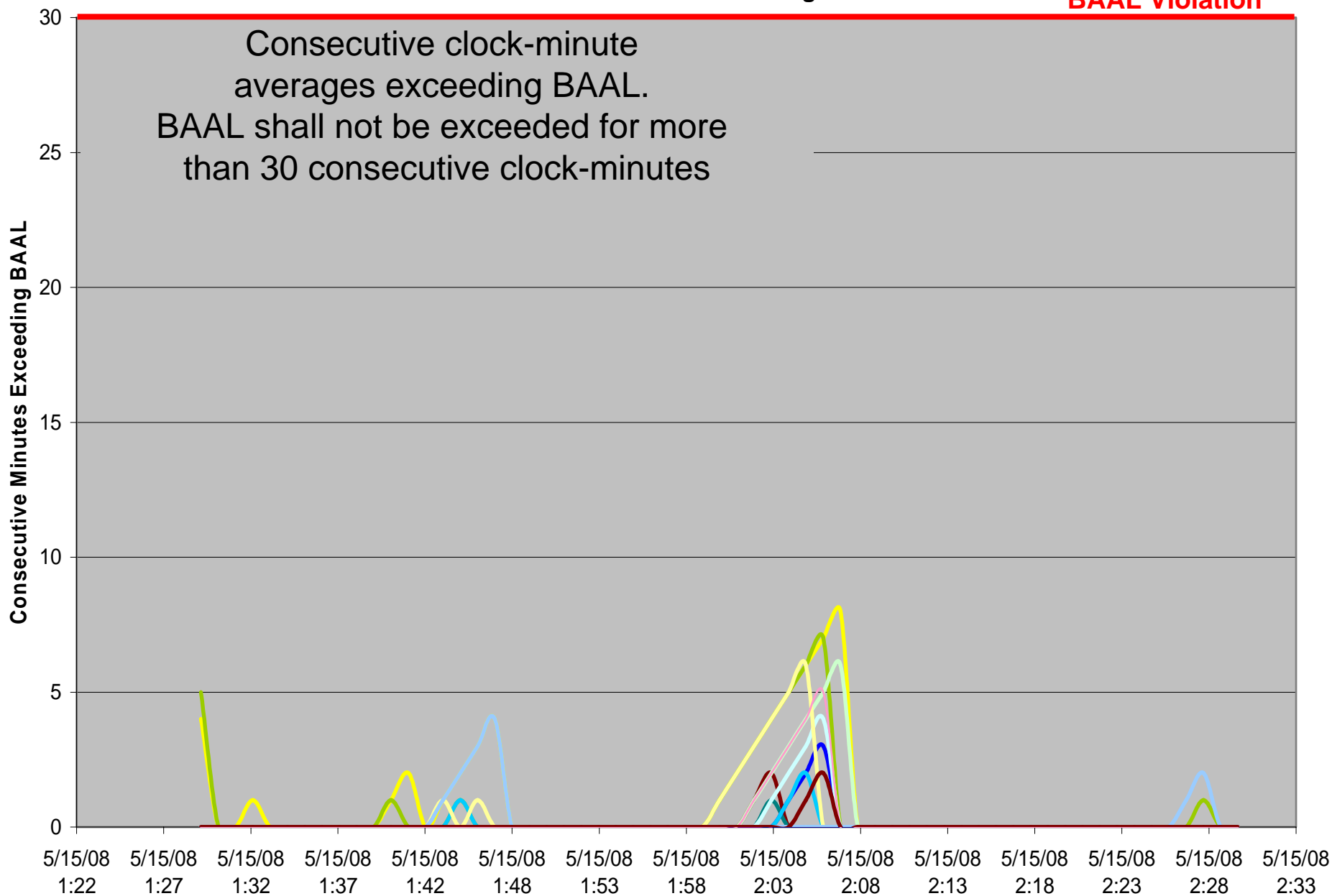


ACPS1 Clock-Minute Averages



Consecutive Minutes Exceeding BAAL

BAAL Violation*



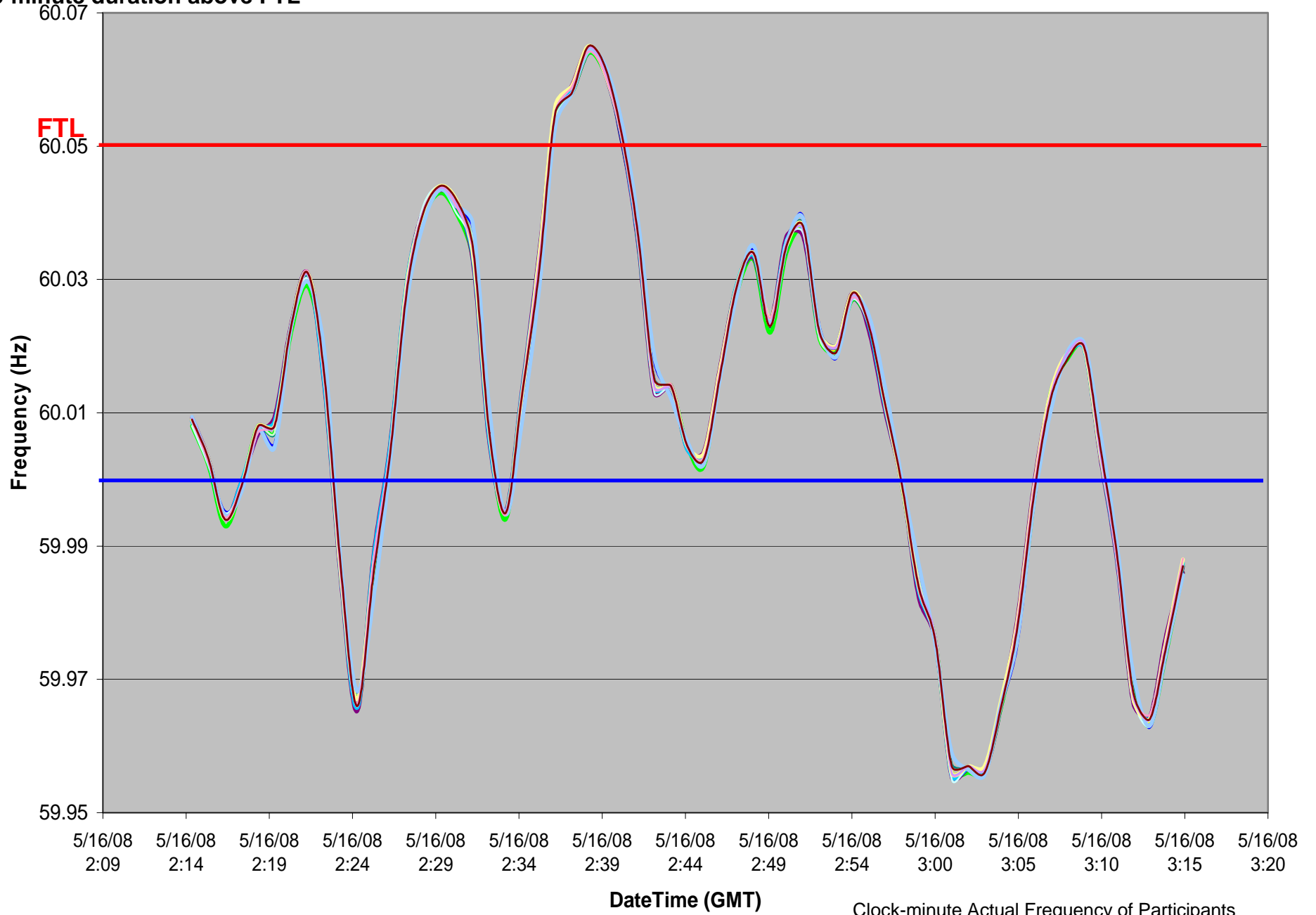
DateTime (GMT)

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5/15/2008 21:37-21:41 EST

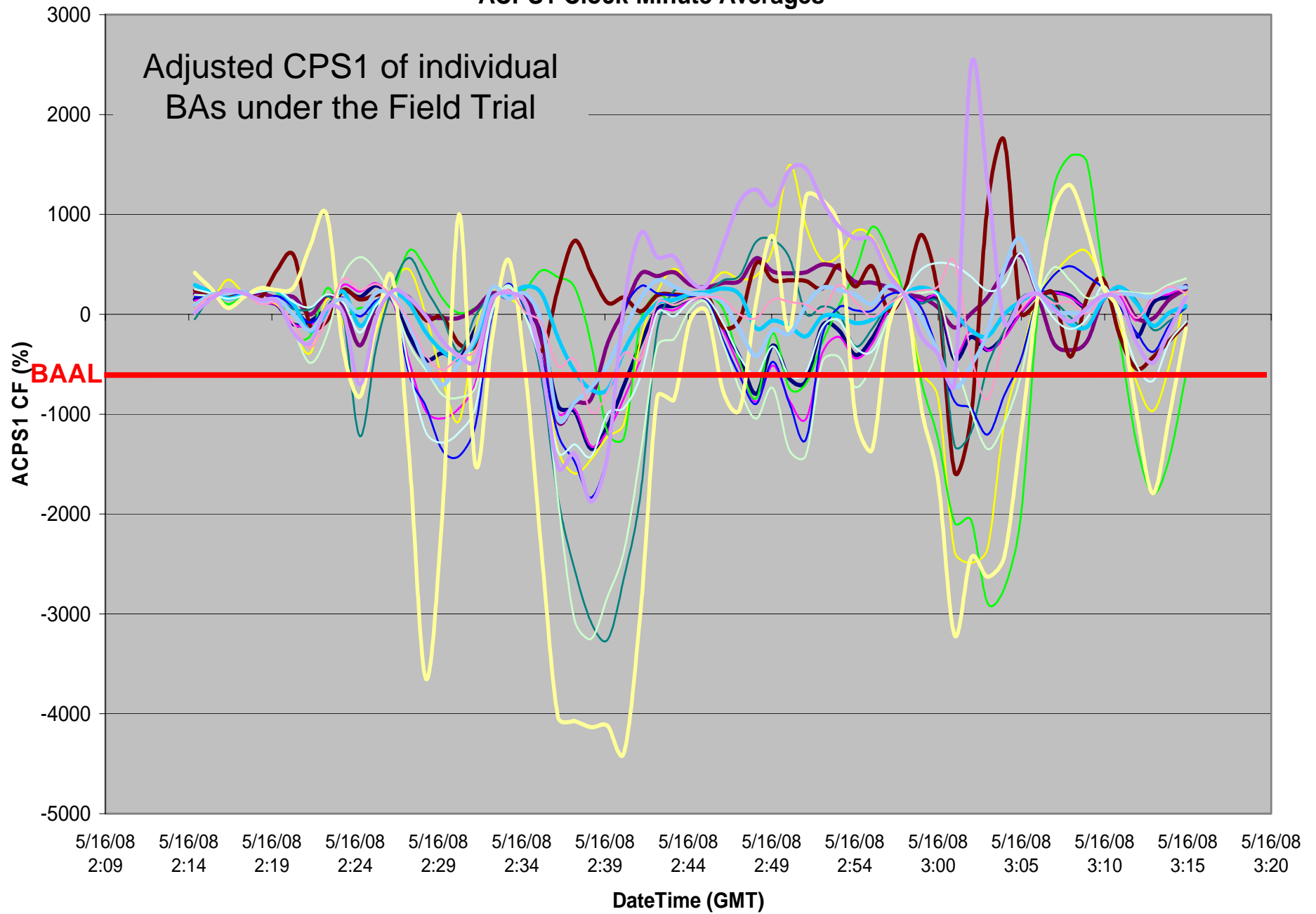
5-minute duration above FTL

Clock-Minute Average Frequency



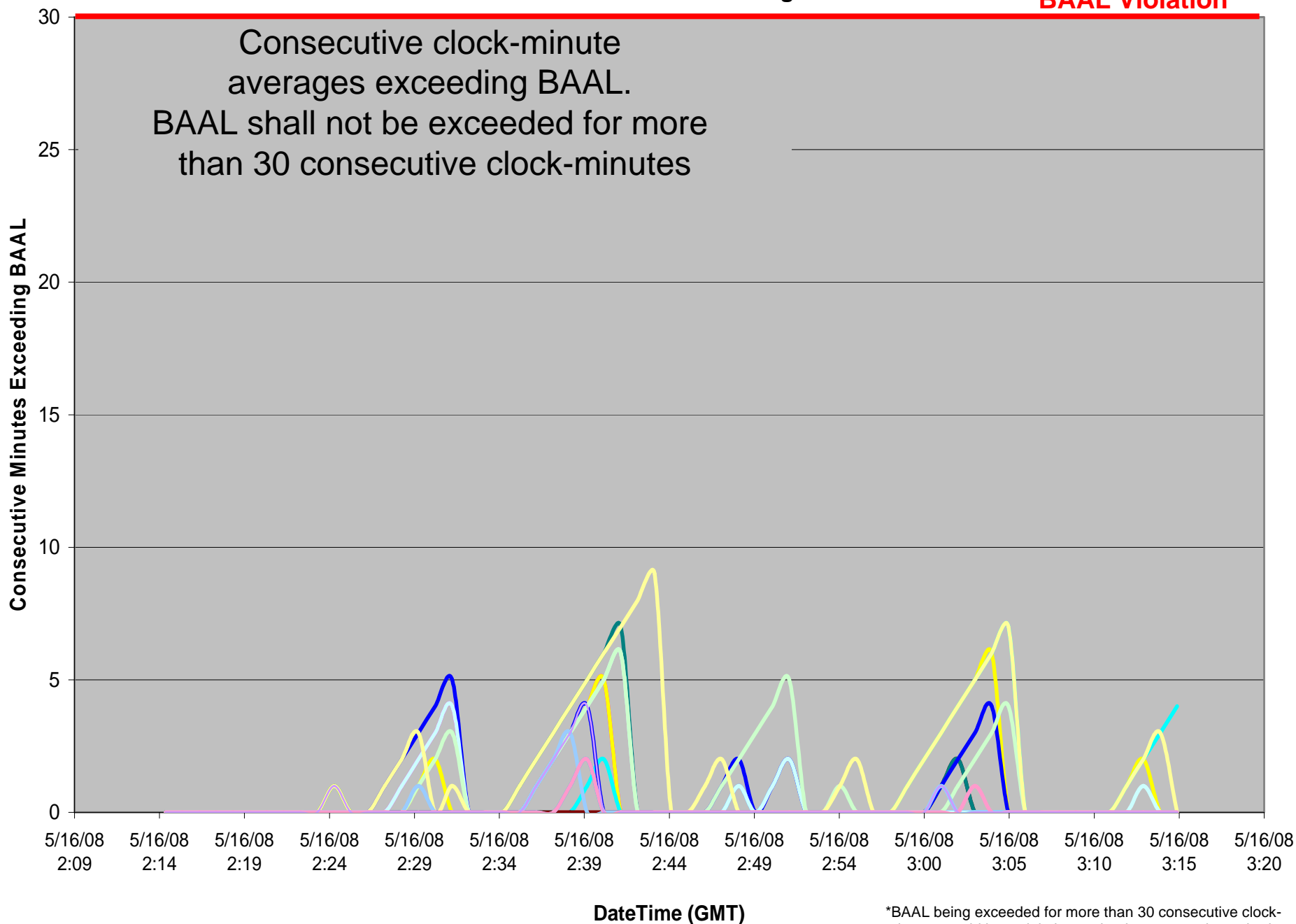
Clock-minute Actual Frequency of Participants

ACPS1 Clock-Minute Averages



Consecutive Minutes Exceeding BAAL

BAAL Violation*

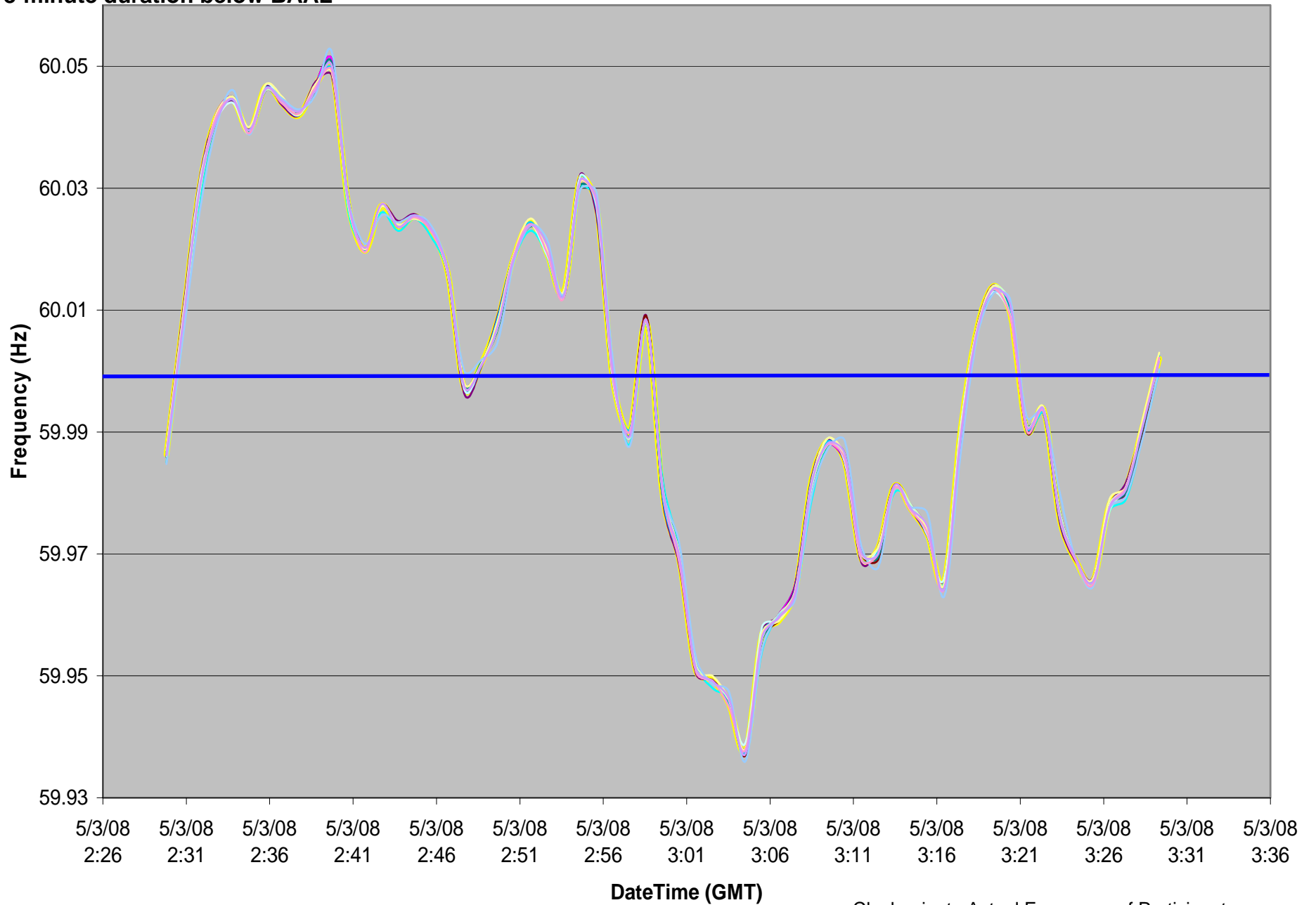


*BAAL being exceeded for more than 30 consecutive clock-minutes would be a violation under the proposed standard.

05/02/2008 22:01-22:18 EST

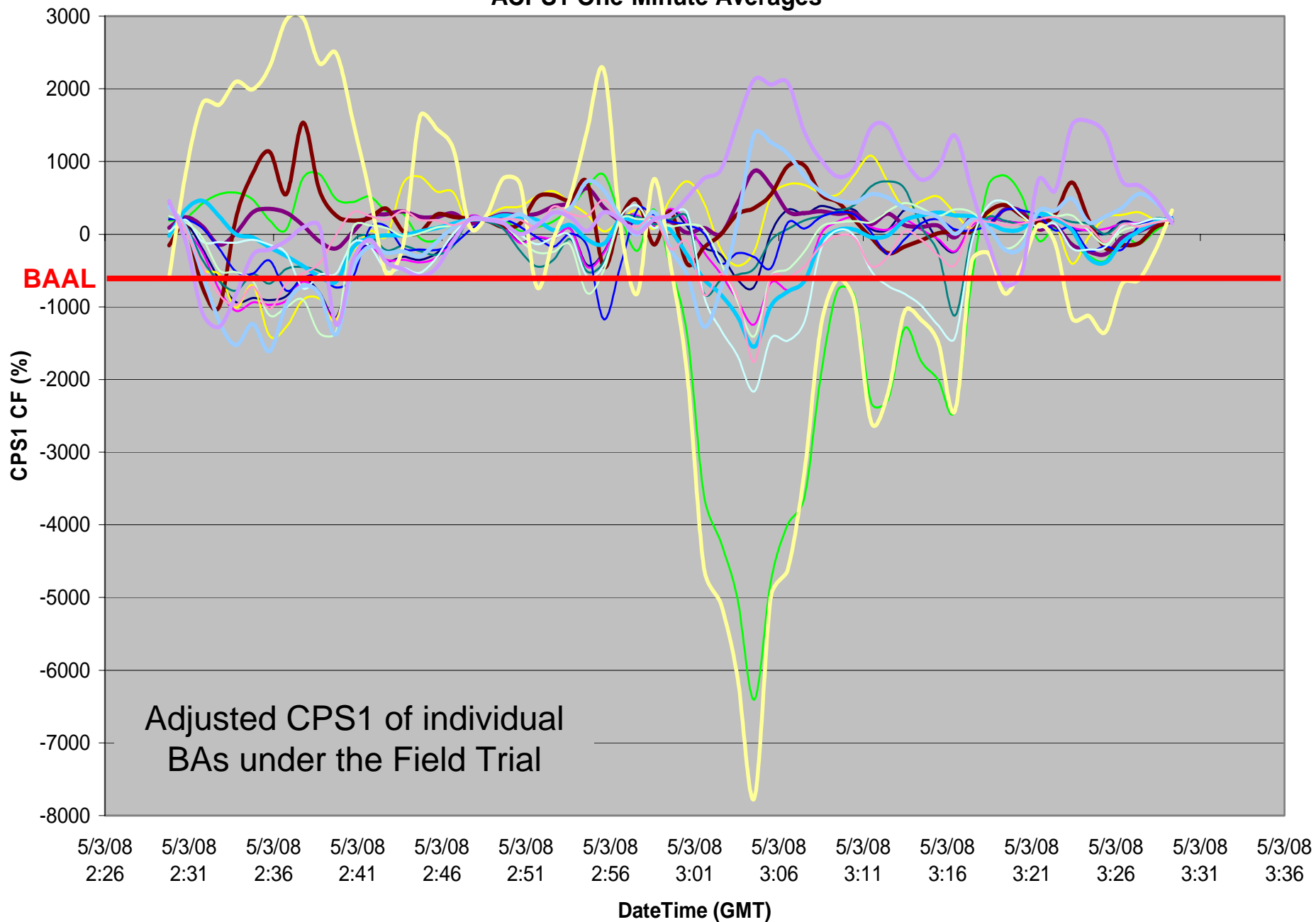
18-minute duration below BAAL

Frequency



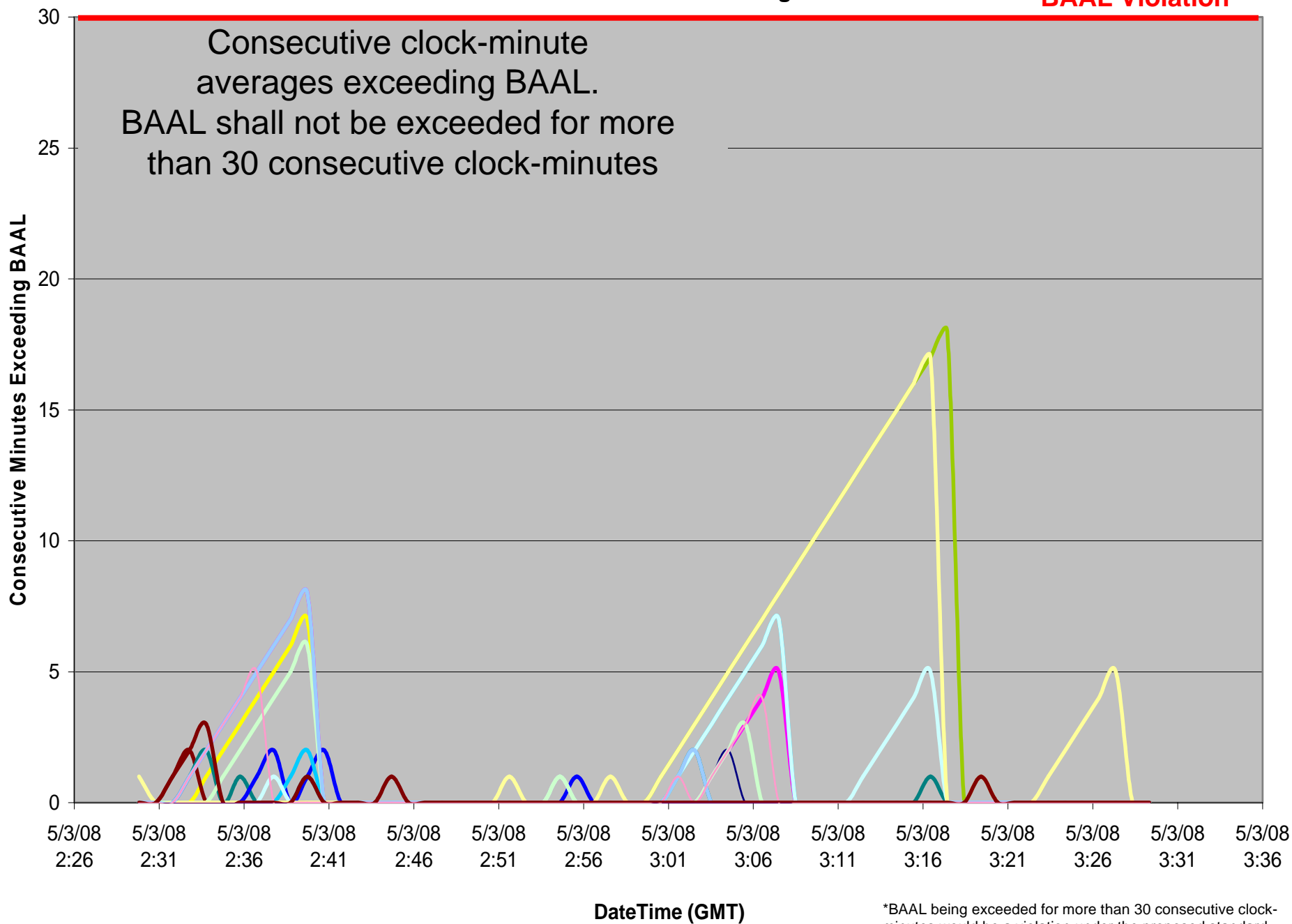
Clock-minute Actual Frequency of Participants

ACPS1 One-Minute Averages



Consecutive Minutes Exceeding BAAL

BAAL Violation*



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