



Manual TEC Analysis

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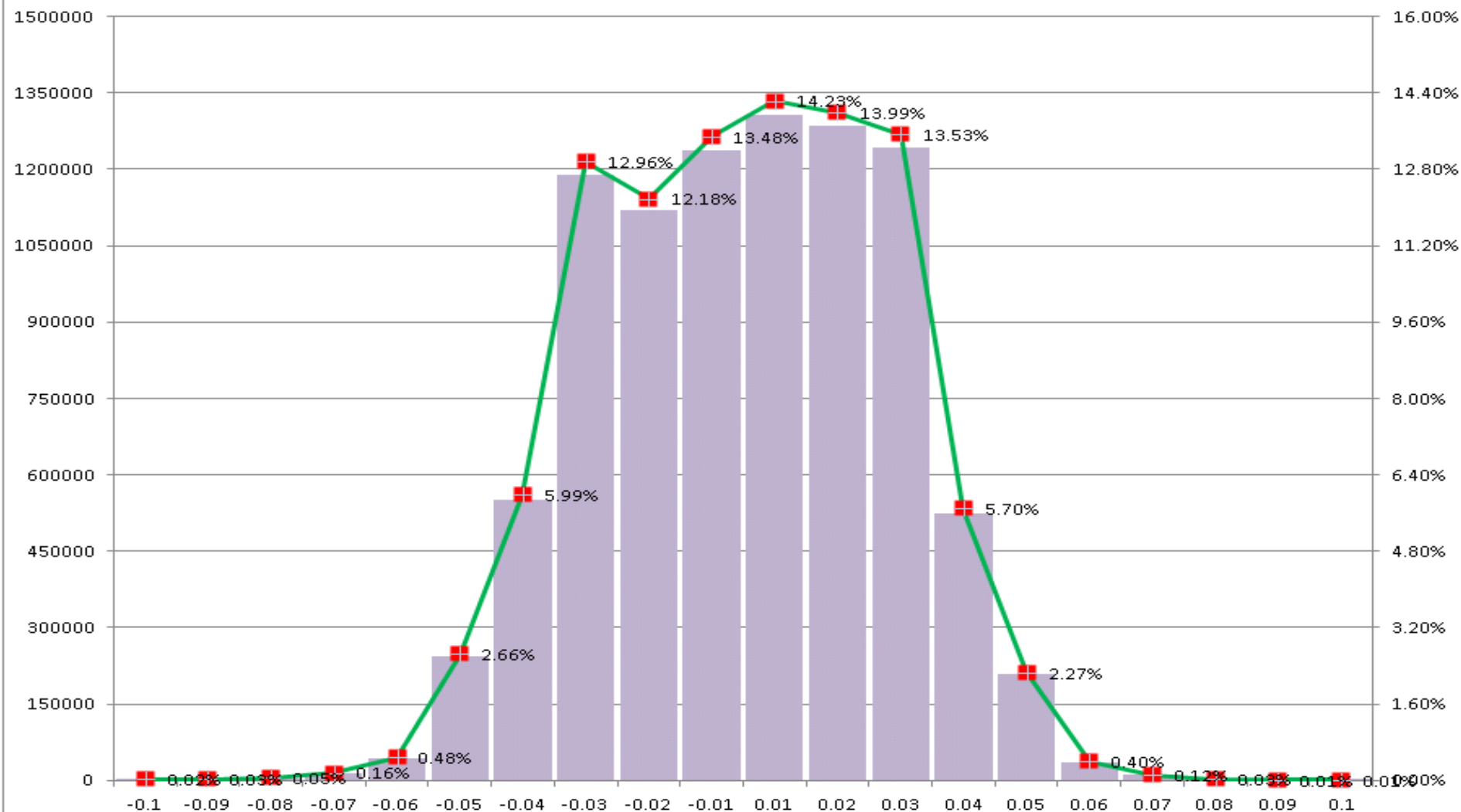
Discussion point

- ERCOT Frequency Profile
- Manual Time Error Correction
 1. Manual TECs from Jan -2011 to March-2012(March 30th)
 2. Plot of Regulation during Manual TECs
- Manual Time Error Correction Procedure
- NERC BAL-004 Standard
- NAESB Manual-Time Error Correction procedure
- Next Steps

Frequency Profile and Duration Jan-2011 to Feb-2012

4-Sec Sample

Duration in %

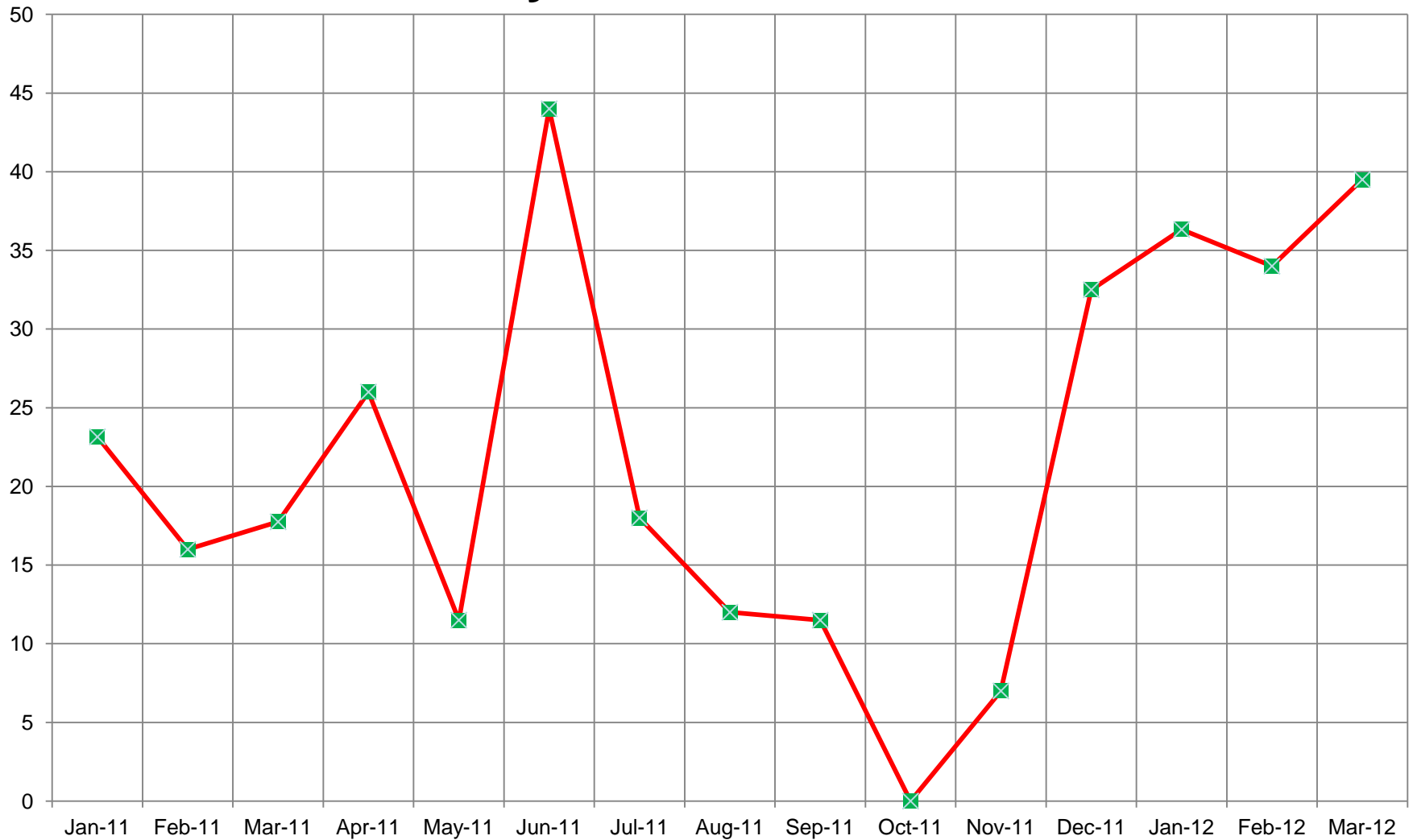


Frequency Profile – Table

Delta Frequency	4-Sec Sample	Duration in %	Frequency above and Below 60 Hz
-0.15	250	0.00%	
-0.14	463	0.01%	
-0.13	577	0.01%	
-0.12	869	0.01%	
-0.11	950	0.01%	
-0.1	2058	0.02%	
-0.09	3049	0.03%	
-0.08	4735	0.05%	
-0.07	14964	0.16%	
-0.06	44345	0.48%	
-0.05	243769	2.66%	
-0.04	549639	5.99%	
-0.03	1189906	12.96%	
-0.02	1118180	12.18%	
-0.01	1237401	13.48%	48.05%
0.01	1306495	14.23%	50.31%
0.02	1284363	13.99%	
0.03	1242434	13.53%	
0.04	523284	5.70%	
0.05	208267	2.27%	
0.06	36652	0.40%	
0.07	11179	0.12%	
0.08	3179	0.03%	
0.09	1363	0.01%	
0.1	757	0.01%	
0.11	331	0.00%	
0.12	181	0.00%	
0.13	56	0.00%	
0.14	50	0.00%	
0.15	42	0.00%	

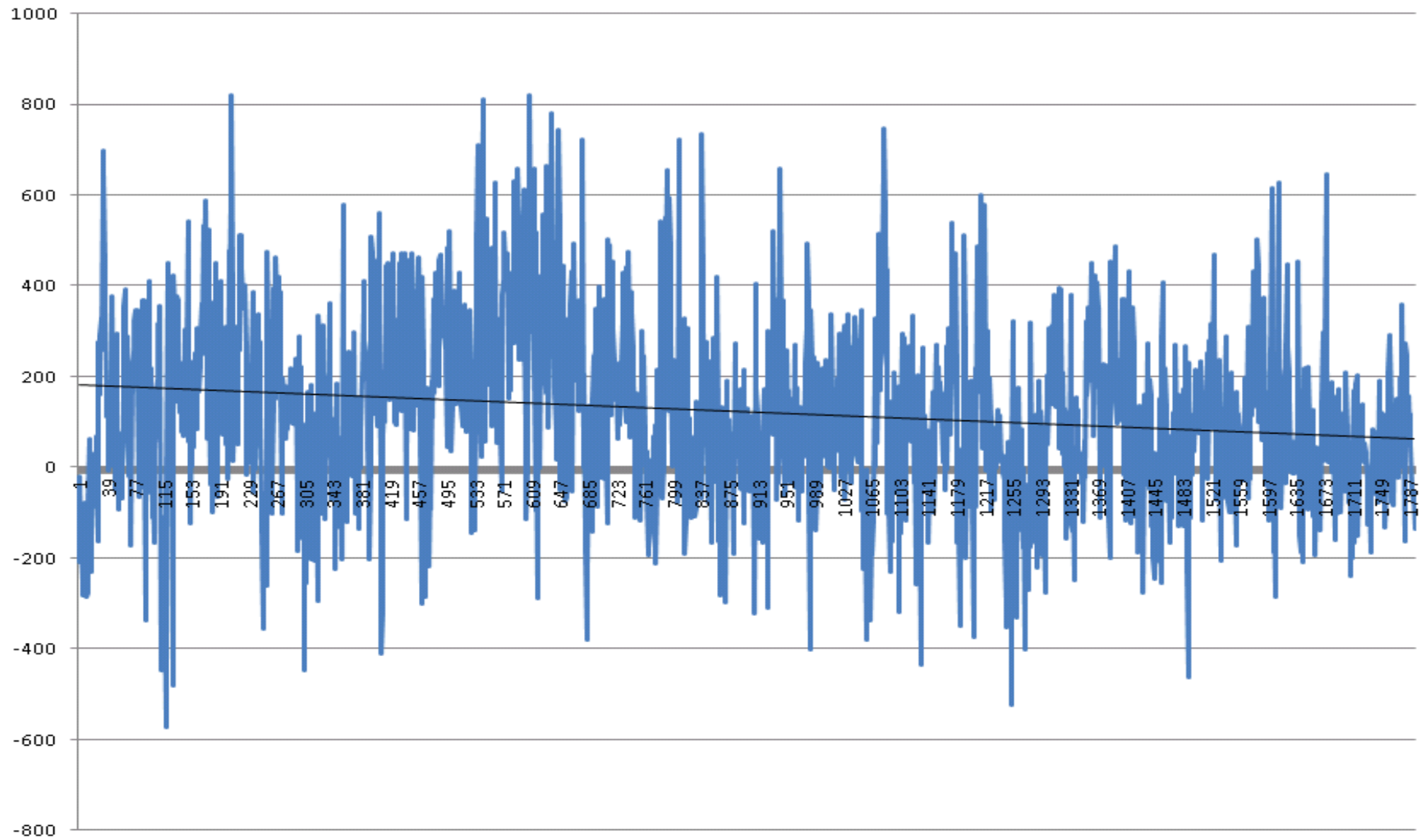
Monthly manual TEC Hours

Monthly manual TEC Hours



ERCOT Regulation during Manual TEC

— ERCOT Regulation Deployed
— Linear (ERCOT Regulation Deployed)



Manual Time Error Correction Procedure

1. When time error is equal to or greater than ± 30 seconds, ERCOT may initiate a time correction
2. Time Error Corrections normally start and end on the hour or half-hour
3. The Time Error Correction will be ended when the error is less than ± 27.5 seconds.
4. The time correction may be postponed if it is determined that load patterns in the immediate future will result in the desired time correction
5. However, the accumulated time error should not be allowed to exceed thirty-two (32) seconds.
6. ERCOT will not take any action if accumulated time error is trending towards zero

R1. Only a Reliability Coordinator shall be eligible to act as Interconnection Time Monitor.

R2. Each Balancing Authority, when requested, shall participate in a Time Error Correction by one of the following methods:

R2.1. The Balancing Authority shall offset its frequency schedule by 0.02 Hertz, leaving the Frequency Bias Setting normal; or

R2.2. The Balancing Authority shall offset its Net Interchange Schedule (MW) by an amount equal to the computed bias contribution during a 0.02 Hertz Frequency Deviation (i.e., 20% of the Frequency Bias Setting).

R3. Any Reliability Coordinator in an Interconnection shall have the authority to request the Interconnection Time Monitor to terminate a Time Error Correction in progress, or a scheduled Time Error Correction that has not begun, for reliability considerations. R3.1. Balancing Authorities that have reliability concerns with the execution of a Time Error Correction shall notify their Reliability Coordinator and request the termination of a Time Error Correction in progress.

Business Practices Requirements:

1. Each Balancing Authority shall participate in Time Error Correction unless it is operating asynchronously to its Interconnection.

1.1. Balancing Authorities operating asynchronously who establish their own time error control bands, shall notify the Interconnection Time Monitor of the bands being utilized, and shall also provide notification if they are changed.

5. Interconnection time monitoring. Each Interconnection Time Monitor shall monitor time error and shall initiate or terminate corrective action orders according to the following table:

<u>Time</u> <u>(seconds)</u>	<i>Initiation</i>			<i>Termination</i>		
	East	West	ERCOT	East	West	ERCOT
Slow	-10	-2	-3	-6	±0.5	±0.5
Fast	+10	+2	+3	+6	±0.5	±0.5

Next Steps

1. Update the NAESB Manual Time Error Procedure
2. Update ERCOT Control Room Procedure
3. Send out the market notice with the start date

Questions??