

Manual Time Error Correction

Purpose:

Interconnection frequency is normally scheduled at 60.00 Hz and controlled to that value. The control is imperfect and over time the frequency will average slightly above or below 60.00 Hz resulting in mechanical electric clocks developing an error relative to true time. This Standard specifies the procedure to be used for reducing the error to within acceptable limits of true time.

Applicability:

Balancing Authorities, Interconnection Time Monitor

Definitions:

Balancing Authority (BA) – The entity responsible for integrating resource plans ahead of time, maintaining load-interchange-generation balance within a Balancing Authority Area, and supporting Interconnection frequency in real time.

Balancing Authority Area - An electrical system bounded by interconnection (tie-line) metering and telemetry, where the Balancing Authority controls (either directly or by contract) generation to maintain its Interchange Schedule with other Balancing Authority Areas and contributes to frequency regulation of the Interconnection.

Frequency Bias Setting - A value, in MW/0.1 Hz, set into a Balancing Authority's AGC equipment to represent a Balancing Authority's response to a frequency deviation.

Interchange Schedule - The planned energy exchange between two adjacent Balancing Authorities.

Interconnection – Any one of the three major electric system networks in North America: Eastern, Western, and ERCOT.

Interconnection Time Monitor – An entity that monitors Time Error and initiates and terminates Time Error Corrections.

Leap Second - A Leap Second is a second of time added to Coordinated Universal Time to make it agree with astronomical time to within 0.9 seconds. Historically, Leap Seconds are implemented as needed on June 30th or December 31st. (National Institute of Standards and Technology)

Time Error – Accumulated time difference between time based on Interconnection frequency and the National Bureau of Standards time.

Time Error Correction - An offset to the Interconnection’s scheduled frequency to correct for accumulated Time Error.

WECCNet – a messaging system used by the Western Electric Coordinating Council (WECC) for use by participating utility’s dispatchers and network administrators.

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.
2. An Interconnection Time Monitor shall exist for each Interconnection.
3. The Interconnection Time Monitor shall calibrate its time error device at least annually against the National Bureau of Standards time.
4. Time Error initiation. Time error corrections shall start and end on the hour or half-hour, and notice shall be given at least one hour before the time error correction is to start or stop. Time Error corrections shall last at least one hour, unless terminated by a Reliability Coordinator. Time Error corrections for fast time shall not be initiated between 0400-1100 Central Time. All Balancing Authorities within an Interconnection shall make all Time Error corrections directed by the Interconnection Time Monitor for its Interconnection. All Balancing Authorities within an Interconnection shall make Time Error Corrections at the same rate.
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

6. Time Error Correction labeling. Time error correction notifications shall be labeled alphabetically on a monthly basis (A-Z, AA-AZ, BA-BZ,...).
7. Time correction offset. Each Balancing Authority, when requested, shall participate in a Time Error Correction by one of the following two methods:

- 7.1. Frequency offset. The Balancing Authority may offset its frequency schedule in accordance to the directives of the Interconnection Time Monitor, leaving the Frequency Bias Setting normal,
- 7.2. Schedule offset. If the frequency schedule cannot be offset as directed by the Interconnection Time Monitor, the Balancing Authority may offset its net Interchange Schedule (MW) by an amount equal to the computed bias contribution during an equivalent frequency deviation`.
8. Interconnection Time Error notification. On the first day of each month, the Interconnection Time Monitor shall issue a notification of time error accurate to within 0.01 second to all Reliability Coordinators within the Interconnection to assure uniform calibration of time standards.
9. Western Interconnection time error notification. Within the Western Interconnection, the Interconnection Time Monitor shall provide the accumulated time error (accurate to within 0.001 second) to all Balancing Authorities on a daily basis at 1400 PDT/PST using the WECCNet. The alphabetic designator shall accompany time error notification if a time error correction is in progress.
10. After the premature termination of a manual time correction, a slow time correction can be reinstated after the frequency has returned to 60 Hz or above for a period of ten minutes. A fast time correction can be reinitiated after the frequency has returned to 60 Hz or lower for a period of ten minutes. At least one hour shall elapse between the termination and re-initiation notices.
11. Time correction on reconnection. When one or more Balancing Authorities have been separated from the Interconnection, upon reconnection, they shall adjust their time error devices to coincide with the time error of the Interconnection Time Monitor. The Balancing Authorities shall notify the Interconnection Time Monitor they are ready to receive the necessary adjustment to time error as soon as possible after reconnection.
12. Leap Seconds. Balancing Authorities using time error devices that are not capable of automatically adjusting for Leap Seconds shall arrange to receive advance notice of the Leap Second and make the necessary manual adjustment in a manner that will not introduce an improper Interchange Schedule into their control system.