

Standard (S) control point:

The standard (S) regulation signal point that is used for steam and other slower responding units is derived from the ACE which has both frequency and a tie error component. The frequency error is calculated from the filtered actual frequency and the scheduled frequency. The interchange error is calculated from the actual net interchange and the scheduled interchange. The scheduled interchange is the sum of the EES schedule, the total dynamic schedule and the total shared reserve schedule. The frequency and interchange errors are summed and then filtered using a standard proportional – integral (PI) controller. The PI controller output is then filtered using a first order exponential filter to produce the standard REGA signal. This filtered signal is used to accommodate the slower ramp rates of the steam units.

FO regulation control point: not currently a production signal

The frequency only (FO) regulation signal point is based only on the frequency component of the ACE. The FO regulation signal point will be calculated by taking the AGC frequency minus the scheduled frequency multiplied by the RTO frequency bias. To ensure that the FO regulation signal does not conflict with the S regulation signal, it will only be active when the frequency and ACE are either both positive or both negative.

FO regulation control point with hold: not currently a production signal

The FO regulation signal point will be calculated by taking the AGC frequency minus the scheduled frequency multiplied by the RTO frequency bias. To ensure that the FO regulation signal does not conflict with the S regulation signal, it will only be active when the frequency and ACE are either both positive or both negative. In addition, the slope of each the ACE and Frequency will be compared. If the two points are in conflict and either the magnitude and/or slope of one is positive and other one negative, then the FO with hold regulation point will be held at the current value.

Dynamic regulation control point:

The Dynamic (D) regulation signal point that is used for fast-responding resources is derived from the ACE, which has both frequency error and a tie error component. The frequency error is calculated from the filtered actual frequency and the scheduled frequency. The tie error is calculated from the actual net interchange and the scheduled interchange. The scheduled interchange is the sum of the EES schedule, the total dynamic schedule and the total shared reserve schedule. The frequency and interchange errors are summed and then filtered using a standard proportional – integral (PI) controller. This signal is then normalized and RTO Treg limited. This regulation signal takes into account the RTO frequency and tie error.