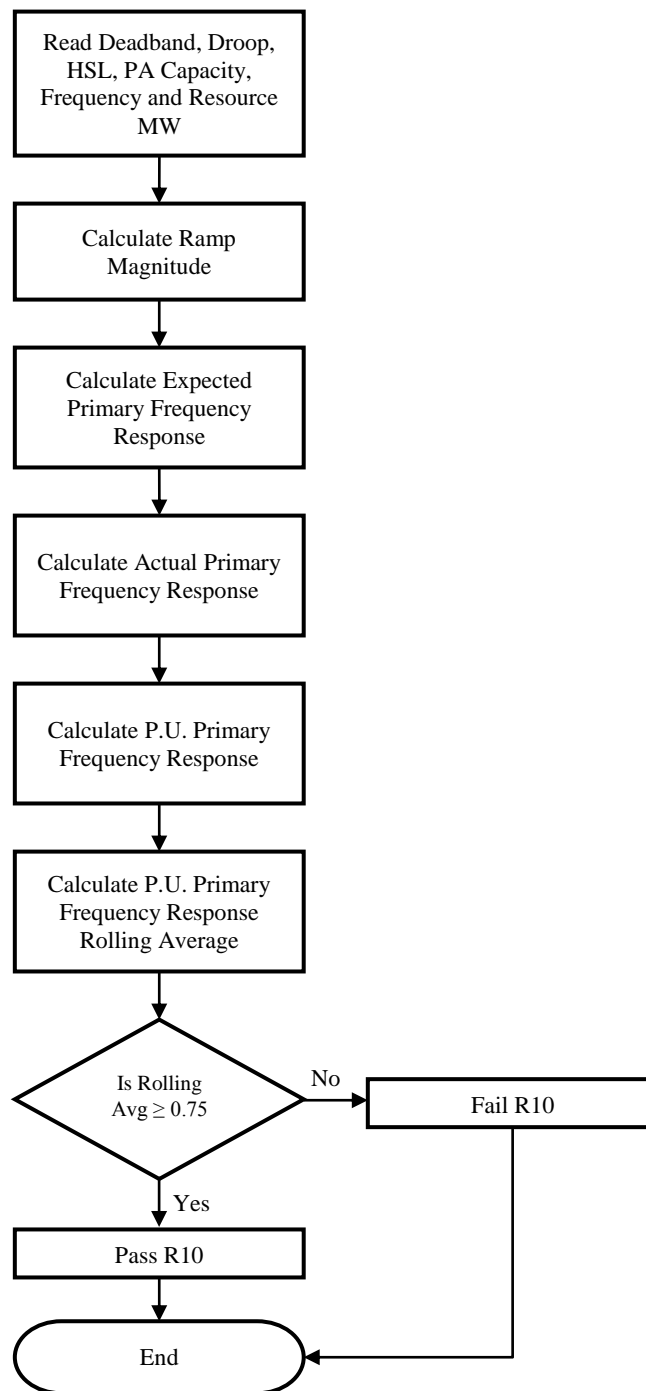


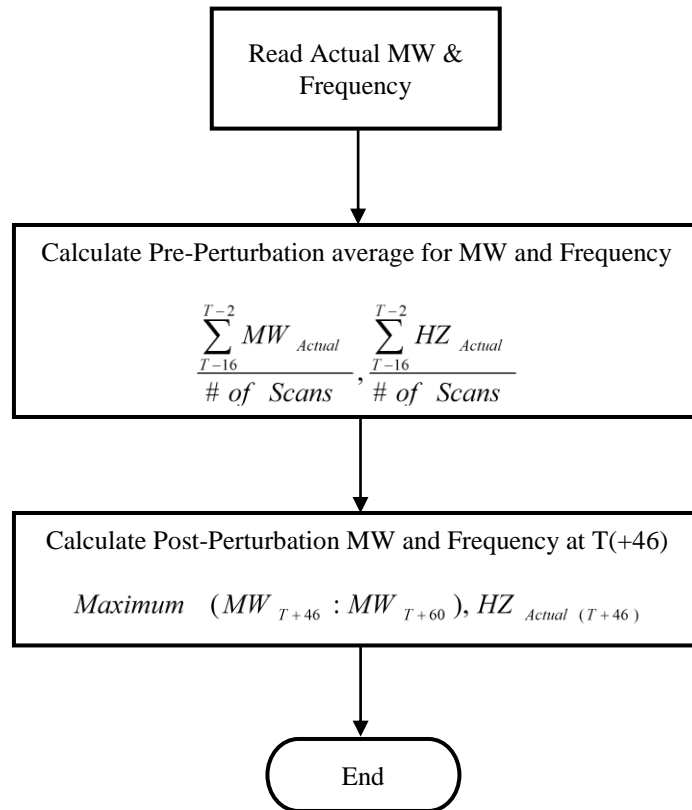
**Attachment B to
Primary Frequency Response Reference Document**

**Sustained Primary Frequency Response Methodology for
BAL-001-TRE-1**

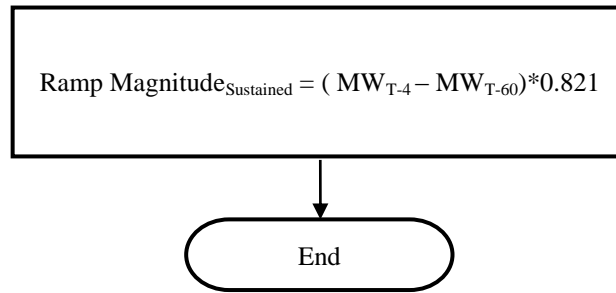
Primary Frequency Response Measurement and Rolling Average Calculation - Sustained Response



Pre/Post-Perturbation Average MW and Average Frequency Calculations



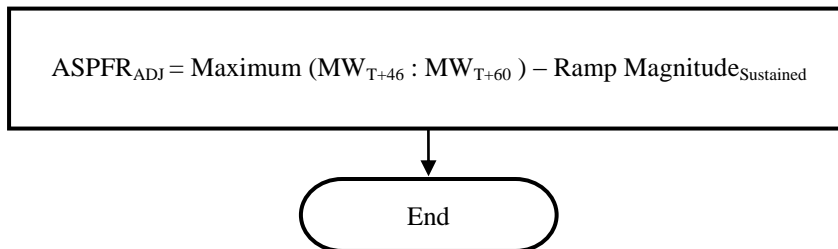
Ramp Magnitude Calculation – Sustained



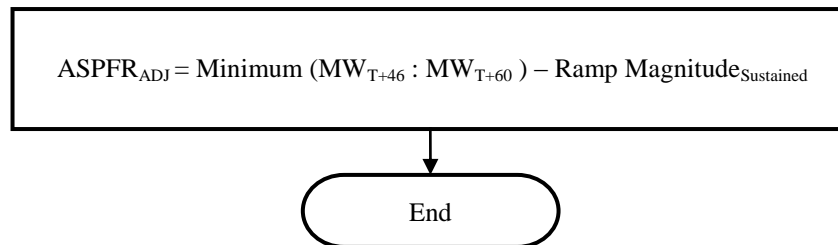
$(MW_{T-4} - MW_{T-60})$ represents the MW ramp of the generator resource/generator facility for a full minute prior to the event. The factor 0.821 adjusts this full minute ramp to represent the ramp the generator would have changed the system had it been allowed to continue on its ramp to T+46 unencumbered.

Actual Sustained Primary Frequency Response (ASPFR_{adj})

For low frequency events:

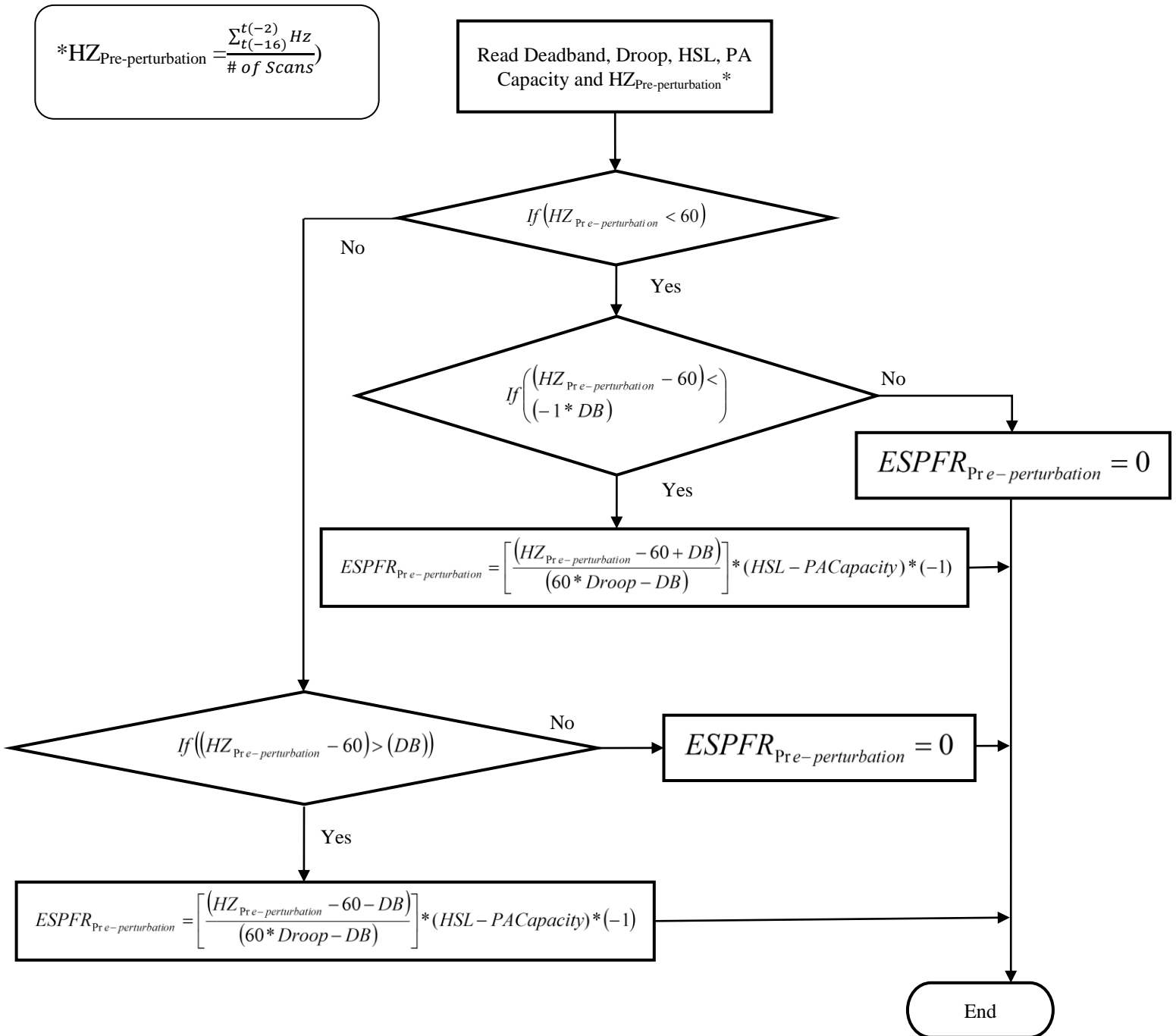


For high frequency events:

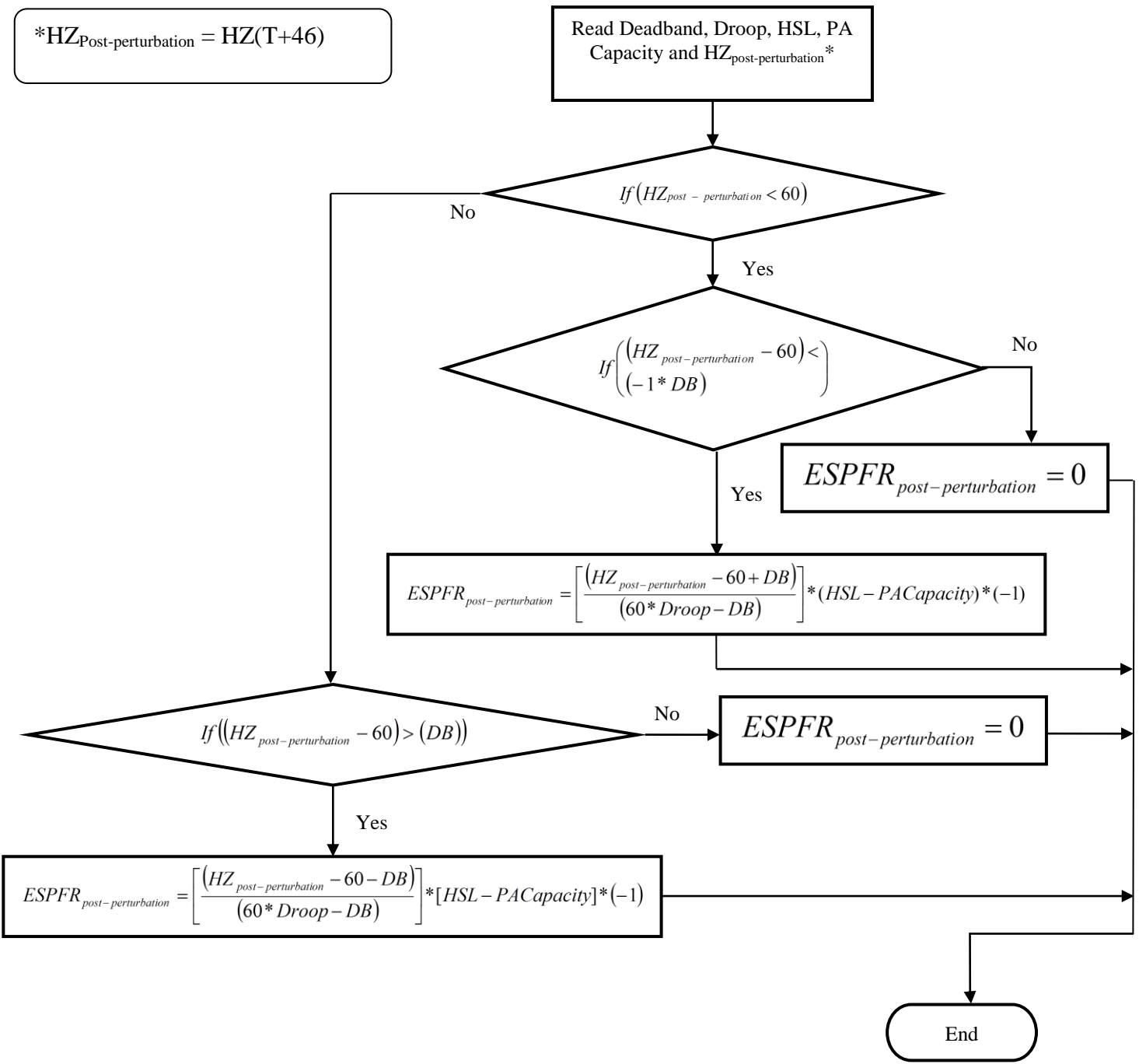


Expected Sustained Primary Frequency Response Calculation

Use the droop and deadband as required by R6. For Combined Cycle Facility evaluation as a single resource (includes MW production of the steam turbine generator), the EPFR will use 5.78% droop in all calculations.



$$*HZ_{\text{Post-perturbation}} = HZ(T+46)$$

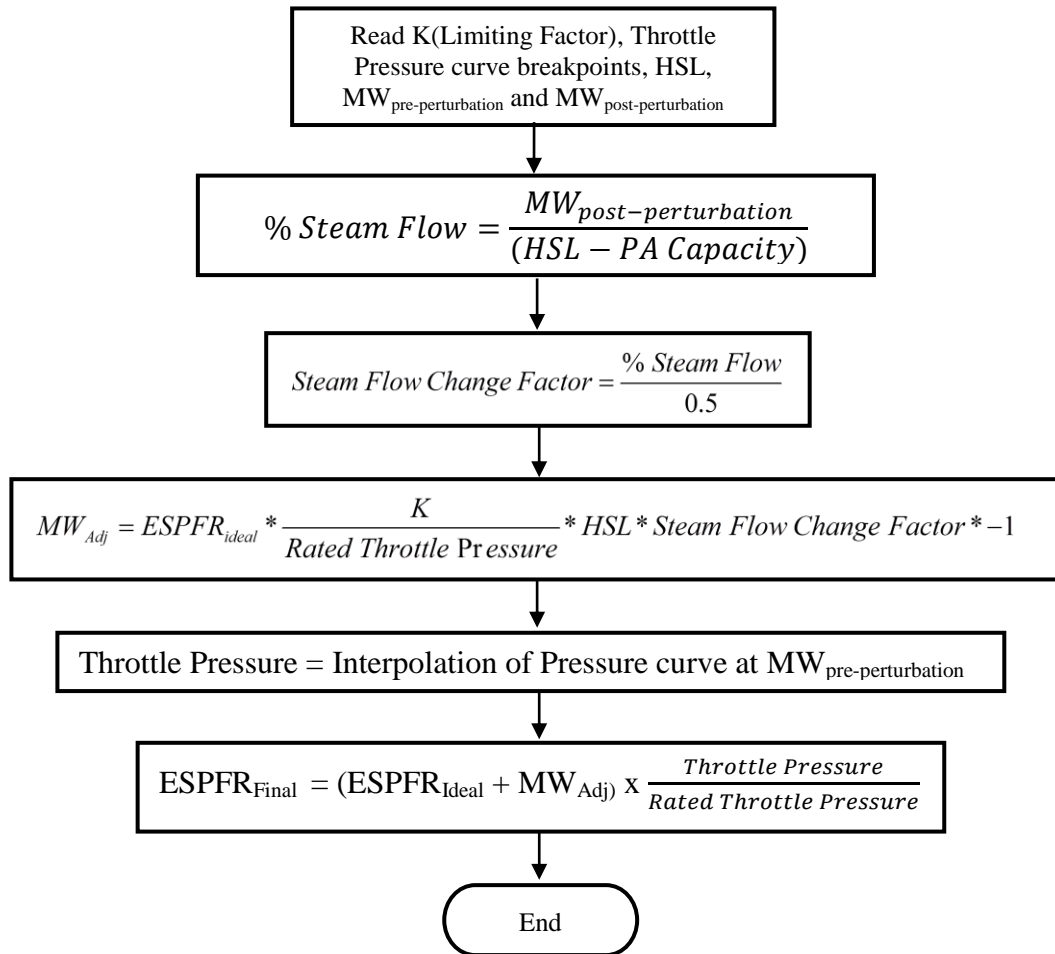


$$ESPFR_{ideal} = ESPFR_{post-perturbation} - ESPFR_{pre-perturbation}$$

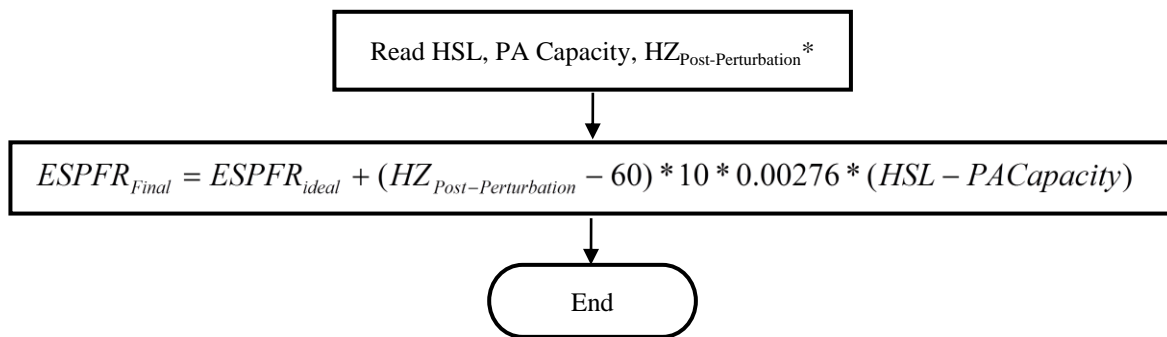
Adjustment for Steam Turbine

$MW_{\text{Post-perturbation}} = \text{Maximum} (MW_{T+46} : MW_{T+60})$ for low frequency events.

$MW_{\text{Post-perturbation}} = \text{Minimum} (MW_{T+46} : MW_{T+60})$ for high frequency events.

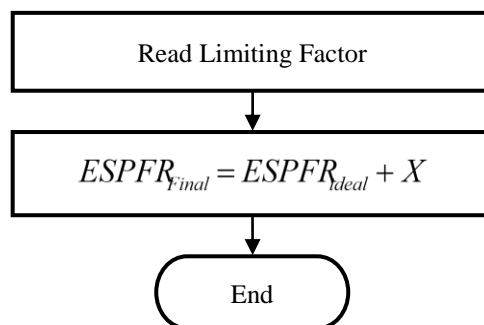


Adjustment for Combustion Turbine and Combined Cycle Facilities



0.00276 is MW/0.1 Hz change per MW of Capacity and represents the MW change in generator output due to the change in mass flow through the combustion turbine due to the speed change of the turbine during the post-perturbation measurement period. (This factor is based on empirical data from a major 2003 event as measured on multiple combustion turbines in ERCOT.)

Adjustment for Other Units

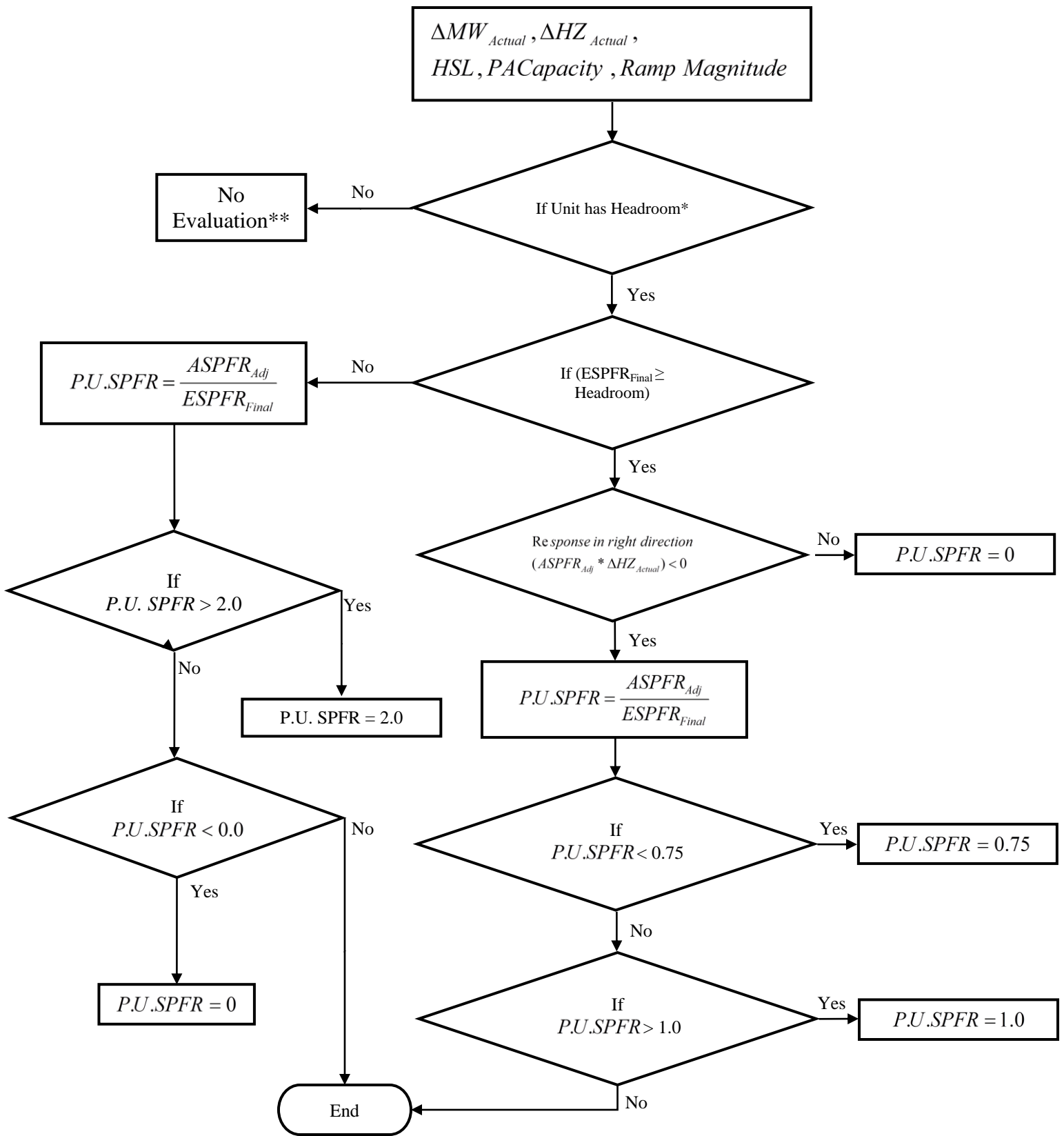


* $HZ_{Actual} = HZ(T+46)$

This adjustment Factor X will be developed to properly model the delivery of PFR due to known and approved technical limitations of the resource. X may be adjusted by the BA and may be variable across the operating range of a resource.

P.U. Sustained Primary Frequency Response Calculation

* $HZ_{Actual} = HZ(T+46)$



* Check for adequate up headroom, low frequency events. Headroom must be greater than either 5MW or 2% of (HSL less PA Capacity), whichever is larger. If a unit does not have adequate up headroom, the unit is considered operating at full capacity and will not be evaluated for low frequency events.

Check for adequate down headroom, high frequency events. Headroom must be greater than either 5MW or 2% of (HSL less PA Capacity), whichever is larger. If a unit does not have adequate down headroom, the unit is considered operating at low capacity and will not be evaluated for high frequency events.

For low frequency events:

$$\text{Headroom} = \text{HSL} - \text{PA Capacity} - \text{MW}_{T-2}$$

For high frequency events:

$$\text{Headroom} = \text{MW}_{T-2} - \text{LSL}$$

**No further evaluation is required for Sustained Primary Frequency Response. This event will not be included in the Rolling Average calculation of either Initial or Sustained Primary Frequency Response.

T = Time in Seconds