

Five Rules

1. To keep coupled or cascade loops from fighting among themselves, these loops should be tuned to provide closed loop responses that differ by more than a factor of five. For cascade control, the closed loop response of the secondary loop should be at least five times faster than the response of the primary loop.
2. When step testing, the step size should be at least five times greater than the valve dead band, or measurement noise band.
3. The resolution of the measurement and valve should be better than one-fifth of the control band of the process variable and controller output for upsets.
4. The total scan or execution time of asynchronous digital devices or controllers should be less than one-fifth of the process dead time or time constant, whichever is largest. To prevent A/D chatter, set the scan or execution time just large enough to see a true process variable change greater than the A/D resolution limit.
5. The process variable filter time or transmitter dampening time should be less than one-fifth of the process dead time or time constant, whichever is largest. To prevent valve dither, set the filter time just large enough keep the controller output fluctuations from noise exceeding the valve's resolution limit.

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