Anti-Windup Techniques in Cascade Control System

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Cascade control system has two control loops, and the secondary control loop affects the primary control loop. The anti-windup techniques for cascade control system are developed by considering the two features.

First, the modified-anti-windup techniques are based on the conventional anti-windup techniques, conditional integration and back calculation. They remove overshoot as the integral windup effectively which is not removed in the conventional anti-windup. But modified conditional integration shows that overshoot is remained or settling time is increased in some cases. And modified back calculation demand the static gain of the secondary process, and doesn't reach or pass the set value when the static gain is not within the allowable range.

The other, the new anti-windup technique, predictive anti-windup technique for cascade control system is not to saturate the secondary controller output in the whole time. It shows better control performance than the modified-anti-windup techniques. Also, it is not needed an additional factor for good control performance. So, predictive anti-windup technique for cascade control system is applied to automation software, PROMONICON.