

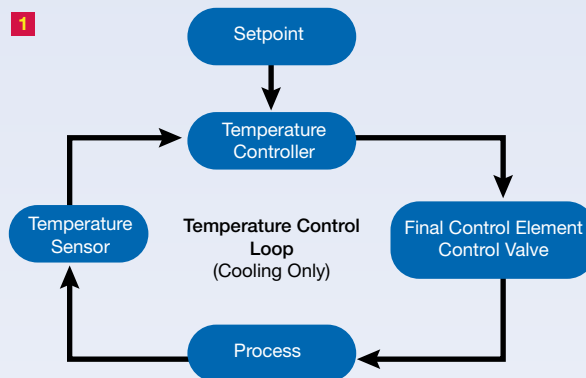
## Look Out for Sluggish Control Systems

Imagine a process temperature that climbs beyond the setpoint. The temperature continues to increase and goes outside of the operating range. The available cooling capacity is sufficient, but the control system is slow to bring the process back into the operating range. Eventually, the control system reacts as it should, and the temperature returns to within the operating range and then to the setpoint.

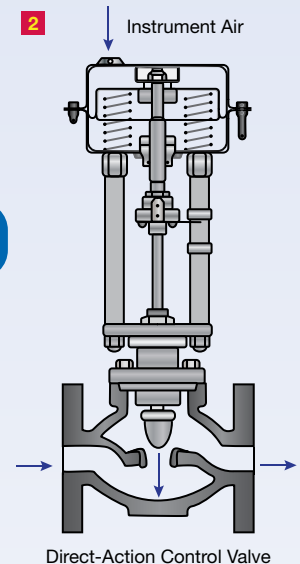
This abnormal chain of events deserves your attention. Well-controlled processes should never leave the operating range, even if they return to acceptable conditions on their own. Control loops that are well designed, tuned, and maintained will operate smoothly, maintaining control with small changes to the valves that regulate coolant, heating, feeds, or other process variables.

A process may have sluggish control because:

- settled solids or corrosion have impaired control valve movement
- the air supply to (or flow within) the control valve is restricted
- the sensor is faulty or blocked
- the control loop tuning is inadequate for the process and needs to be reviewed.



▲ **Figure 1.** A control loop maintains a process variable at a desired setpoint.



▲ **Figure 2.** An air-operated valve can be used to control the coolant flow.

### Did You Know?

- Minor control problems can degrade product quality and may also be an early warning that the system is beginning to fail.
- Any component of the control loop can fail. Check the sensor, control logic, and control devices to rule out any malfunction.
- A control system problem is rarely a random event. The control issue might go away, but if the problem is not resolved, it can return and cause more damage. Random events should not cause the system to leave its safe operating limits.
- If several control loops are experiencing problems, deeper and much more serious problems might be present. Today's sluggish behavior may be tomorrow's failure.

### What Can You Do?

- If a system does not respond as expected, ask others if they have seen the same issue. It is important to determine if the problem is recurring.
- Put a note in the shift log to explain the malfunction. This will warn others to monitor it as well.
- Examine the valve for possible problems. There may be a simple reason that it is not performing as it should — *e.g.*, a leaking air line or a cooling system malfunction.
- Any component of the control loop could be at fault, not just the control valve. If the problem persists, ensure the system is inspected.

**React to your control system problems before a process upset occurs!**

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