means -- is the difference between the PV or SP getting smaller or larger as time goes on.

When there is a "process upset", meaning, when the process variable or the setpoint quickly changes - the PID controller has to quickly change the output to get the process variable back equal to the setpoint. If you have a walk-in cooler with a PID controller and someone opens the door and walks in, the temperature (process variable) could rise very quickly. Therefore the PID controller has to increase the cooling (output) to compensate for this rise in temperature.

Once the PID controller has the process variable equal to the setpoint, a good PID controller will not vary the output. You want the output to be very steady (not changing). If the valve (motor, or other control element) are constantly changing, instead of maintaining a constant value, this could case more wear on the control element.

So there are these two contradictory goals. Fast response (fast change in output) when there is a "process upset", but slow response (steady output) when the PV is close to the setpoint.

Note that the output often goes past (over shoots) the steady-state output to get the process back to the setpoint. For example, a cooler may normally have it's cooling valve open 34% to maintain zero degrees (after the cooler has been closed up and the temperature settled down). If someone opens the cooler, walks in, walks around to find something, then walks back out, and then closes the cooler door - the PID controller is freaking out because the temperature may have raised 20 degrees! So it may crank the cooling valve open to 50, 75, or even 100 percent to hurry up and cool the cooler back down -- before slowly closing the cooling valve back down to 34 percent.