

Monitoring a steam condensate line

APPLICATION A190

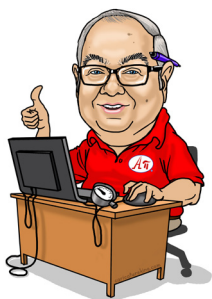
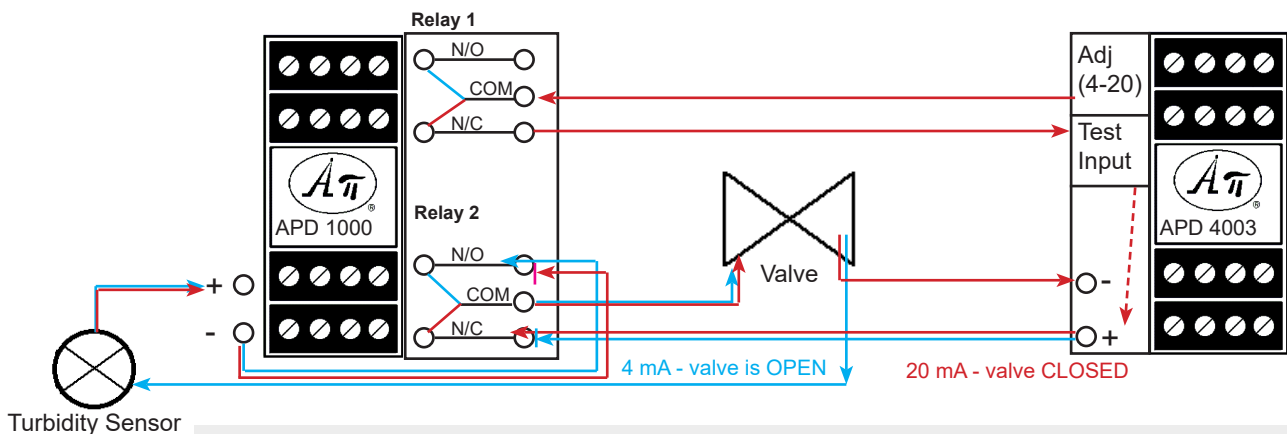
Type of Company: Public Utility
Location: Illinois

The customer is a public utility that uses coal to produce electricity. In a fossil fuel power plant, chemical energy stored in fossil fuels are converted successively into thermal energy, mechanical energy and, finally, electrical energy. Coal travels to a boiler, which heats water to create steam that flows into a turbine. The turbine turns a shaft. On the end of the shaft is a magnet that revolves inside a coil to create electricity. At full load, the boilers can burn 380 tons of coal/hr.



The Engineering Issue

- The engineer has a requirement to monitor the steam condensate line to the boiler. He has installed a turbidity sensor, and needs close a valve when that sensor indicates oil or other contaminants in the line.
- The sensor outputs a 4-20 mA signal.



The engineer used an APD 1000 and an APD 4003. The APD 1000 has two failsafe relay outputs and it monitors the 4-20 mA output from the turbidity sensor. When the process is “safe,” both relay outputs are energized (blue path) and the process runs normally. When the output from the turbidity sensor exceeds the set-point on relay 2, both relays de-energize (red path). This causes the APD 4003 to output a 20 mA signal to the loop, forcing the valve to close fully.

Problem. Solved.