

APPLICATION NEWSLETTER

PROBLEM: Insuring Complete Burning of Flare Gas

The environmental process engine at a chemical company had a process where several monomers were mixed to form a polymer. A by-product of this mixing process was a flammable monomer vapor that collected at the top of the reactor. The vapor was purged from the reactor by an inert gas mixture of nitrogen and carbon dioxide injected into the reactor at 80 PSIG.

The monomer vapor was piped off with the inert gas to a flare stack where it was burned. To compensate for the fire suppressing effect of the nitrogen and carbon dioxide, natural gas is added before the gas is burned. When mixed at a ratio of 2 parts reactor/inert gas to 1 part natural gas, the reactor gas is completely burned.

The EPA wanted the engineer to verify that the

monomer vapor was burned completely. To do this, he needed to install a flow measurement system that could measure and control flow rates of both gases at relatively low pressures with high accuracy.

SOLUTION: An LFE model 50MJ10-9 was installed in the natural gas line and a 50MW20-1 was put in the purge gas line. Draft range DP transmitters, pressure transmitters and RTD's were installed on each line as well. These sent signals to two model 1900 Flow Totalizers that recorded the cumulative flow in each line. The flow totalizers then sent a 4-20 mA signal, proportional to the flow rate, to a Dual Loop PID Controller. The PID controller compared the flow rates on the two lines and sent a signal to a 1" globe style control valve with a positioner and I/P. This opened and closed the valve to increase or decrease the natural gas flow in proportion to increases and decreases in the purge gas flow.

