

عنوان مقاله:

Influence of Pipeline Operating Pressure on Value Setting of Automatic Control Valves at Different Pressure Drop Rates

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خلاصه مقاله:

When a natural gas pipeline ruptures, the adjacent upstream and downstream automatic control valves (ACV) should close quickly to prevent leakage or explosion. The differential pressure set point (DPS) at each valve location is the main criteria for value setting in ACV actions. If the DPS is not properly adjusted, the ACV may mistakenly close or it may not take any actions at a proper time. In this study, the effect of characteristic parameters such as pipeline operational pressure (POP) and pipeline pressure drop rate (ROD) due to rupture or a major leak was experimentally investigated on DPS. 25 different conditions with the double set of the mentioned typical characteristic parameters were chosen. In each condition, the differential pressure (DP) was measured over a period of 180 s by statistically analyzing the experimental results, so 25 maximum DP values (DPSs) were obtained. The DPS rises by an increase in ROD or a decrease in POP. Because of using nitrogen gas instead of natural gas for safety reasons and the uncertainties, the DPS results can be practically applied by adding a safety factor of 15%. Finally, the diagram of DPS with respect to ROD and that of non-dimensional DPS (DOP) versus non-dimensional ROD (RTP) were provided for different POP's.

کلمات کلیدی:

Automatic Control Valve, Gas Pipelines, Operating Pressure, Pressure Drop Rate

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