

NECESSITY OF INSTALLATION AN AUTOMATIC VALVE IN HIGH RISK BRANCHES OF GAS MAINLINES

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ABSTRACT

Main Gas Pipelines include a great number of valves along their entire length. These valves work like gateways; they are usually open and let natural gas to flow freely, but they can be used to stop gas flow along a certain section of pipe. There are many reasons that a pipeline may need to restrict gas flow in certain areas, including emergency shutdown and maintenance. These large valves can be placed in every 5 to 20 miles along the pipelines. They are the subject of the regulations such as ASME B31.8.

According to ASME B31.8-2020, "Onshore block valves shall be installed in new transmission pipelines at the time of construction to isolate the pipeline for maintenance and for response to operating emergencies". "Valve shall be installed in high pressure distribution systems in accessible location to reduce the time to shut down a section of main in an emergency". "This Code does not require the use of automatic valves nor does the code imply that the use of automatic valves presently developed will provide full protection to a piping system". The code just implicated that "Their use and installation shall be at the discretion of the operating company".

Regarding to National Iranian Gas Company (NIGC) regulations, all gas mainlines shall be equipped with Automatic Line Break Valves (ALBVs) to reduce the severity of accident. The company experience shows that this equipment works very well in emergencies. According to NIGC standards, there is no obligation to have ALBV at the beginning of the branches.

In order to managing and securing natural gas pipeline network to ensure minimal disruption, this study investigates the factors involved conservation of the natural gas and continuity of gas service by using an ALBV at the initial point of branches from gas mainlines. A dynamic simulation of pipeline crash has been developed by using ASPEN HYSYS software. Using this approach, thirty two mainlines branches have been analyzed.

Based on the analysis of the selected branches, this essay argues that determining the priority of ALBV installation by proposed approach is needed in combination with a Risk Assessment. Since the selection of automatic valve installation on gas mainlines branches is one of the designers` responsibilities, this study helps pipeline designers to determine where using the ALBV has more priority. It can also reduce methane emissions into the atmosphere, thus helping to reduce environmental pollution in the natural gas transmission process.