

# **STRATEGIC POLYMER DRAG REDUCTION TECHNOLOGY FOR ENERGY CONSERVATION: MODIFICATION OF INJECTION SYSTEM FOR FLUID TRANSPORTATION THROUGH PIPELINE**

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## **ABSTRACT**

Several industrial applications involving fluid transportation through pipelines, such as water, crude oil and hydrocarbons, turbulent friction causes significant reduction in flow rate, resulting in major energy loss. Polymer drag reduction technology is an efficient technique to minimize these losses without altering the pumping system. Injection of parts per million of polymer solution, can enhance the throughput of fluid up to 40% in pipeline. Due to undefined nature of turbulent flow, limitations of industrial function and dependency on parameters of drag reduction technique, strategic methodology of drag reduction technology can promote drag reduction efficiency significantly. In this study, percent drag reduction, using water soluble polymer was investigated in a single phase water pipeline with 10 meter long and 25.4 mm internal diameter. The result showed that the optimization of geometry of nozzle of polymer injection system influences drag reduction efficiency. Similar kind of results observed in two phase pipeline (air combined with water) by Williams et al., (1996) support optimization of injecting system which may influence drag reduction efficiency. Present study was based on optimization of geometry of polymer solution injecting nozzle and pressure in the injection vessel.

**KEYWORDS:** Pipelines, Drag Reduction, Water Soluble Polymer, Injection Method