

Study of Low Loading Heavier Phase in Horizontal Oil-Water Liquid-Liquid Pipe Flow

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Abstract : Production fluids are transported from the platform to tankers or process facilities through transfer pipelines. Water being one of the heavier phases tends to settle at the bottom of pipelines especially at low flow velocities and this has adverse consequences for pipeline integrity. On restart after a shutdown this could result in corrosion and issues for process equipment, thus the need to have the heavier liquid dispersed into the flowing lighter fluid. This study looked at the flow regime of low water cut and low flow velocity oil and water flow using conductive film thickness probes in a large diameter 4-inch pipe to obtain oil and water interface height and the interface structural velocity. A wide range of 0.1-1.0 m/s oil and water mixture velocities was investigated for 0.5-5% water cut. Two fluid model predictions were used to compare with the experimental results.

Keywords : interface height, liquid, velocity, flow regime, dispersed, water cut

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