

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Solid Particle Erosion in Slug Flow¹ NETAJI RAVIKIRAN KESANA, JON THRONEBERRY, BRENTON MCLAURY, SIAMACK SHIRAZI, University of Tulsa — Erosion is a common problem faced by oil and gas industries, and the repair of pipeline fittings damaged by erosion is extremely costly. Therefore measuring erosion under different flow conditions and in different flow geometries is important to help better understand the effect of various parameters on erosion and to provide information to develop protective guidelines for the oil and gas producers. Specifically, this work examines solid particle erosion in multiphase slug flow and the transition to annular flow regime in a 3-inch pipe with solid (sand) particles of different average sizes (20, 150 and 300 microns) and with different liquid viscosities (1cP, 10 cP). The metal loss is measured using intrusive Electrical Resistance (ER) probes which work on the principle of resistivity of the sample and reference elements. Erosion is measured at three different locations in the pipe, two in a bend and one in a straight section. Results demonstrate that metal loss increases by increasing the superficial gas velocity, superficial liquid velocity, or particle diameter; however, metal loss decreases by increasing the liquid viscosity.

¹Sponsored by the member companies of Erosion/Corrosion Research Center.

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Date submitted: 05 Aug 2010

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