

ASME Early Career Technical Journal
2012 ASME Early Career Technical Conference, ASME ECTC
November 2 – 3, Atlanta, Georgia USA

**DESIGN OF SPILL TUBE WITH FEATURES
FOR CONTROLLING AIR BUBBLE GENERATED
FOR AIRCRAFT APPLICATION'S**

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ABSTRACT

In this spill tube research paper, an analytical model is to be created of the distribution of pressure of the air trapped in the spill tube system, where fuel transfer from the sealed tank to the adjacent tanks occurs. This research is a part of a large fuel tank research project. A series of experiments were performed in order to characterize the flow of fluid in the entire spill tube with tubes of different diameters. The experiments were based on a test matrix, and results were kept in increasing order so as to obtain a simple conclusion. Also, trends can be drawn in the form of analytical models that were based on the equations obtained from fluid mechanics books. The experiments performed per spill tube were of two types: first, 0% downstream quantity was taken, and second, 50% downstream quantity was taken. An analytical model was developed using Simulink on the completion of the test matrix. The equations implemented in Simulink were compared with the experimental data so as to ensure the accuracy of the presentation. For various bell mouth geometries, the pressure was optimized with respect to the input flow of mass.

KEYWORD: *Experiment Design and Demonstration, spill tube, air bubble, pressure*

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