10. A SCALE-UP STUDY FOR FOAM BREAKING IN GLCC©

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INTRODUCTION:

TUSTP has completed a study on the use of the GLCC as a foam breaker (Guzman, 2005). The study concluded that the GLCC can operate as a foam breaker or as a foam generator, depending on the operational conditions. The main finding of the Guzman (2005) study is the determination of the operational envelope for foam breaking, which separates the two operational regions: to the left of the operational envelop (lower superficial gas velocities), foam is generated due to the swirling flow at the GLCC inlet section) and is carried-over. On the other hand, to the right of the operational envelop (higher superficial gas velocities) foam is broken due to liquid drainage produced by high centrifugal forces. A model was developed for the prediction of the operational envelope for foam breaking, which compares well with the experimental data.

GAP IN TECHNOLOGY:

The Guzman (2005) study provides the initial study for the GLCC foam breaking project. It is carried out for air/aqueous-foam flow at low pressures. No data have been acquired for different flow conditions, including higher pressures, oil as the liquid-phase, higher liquid viscosities, and the effect of real foamy crudes. The acquisition of such data will enable improvement of the mechanistic model, which will be more suitable for scale up to field conditions. This is the gap that the proposed study will attempt to address.

SCOPE AND OBJECTIVES:

It is proposed to carry out this study utilizing a GLCC facility on a skid, built with Swagelok piping components**.** This will be a flexible and easy to operate facility that will enable fast experimental data acquisition at low cost. When visual observations are not possible (high pressures), the breaking or generating of the foam will be measured by taking samples from the GLCC gas outlet.

PHASE I (2006): During this initial phase of the proposed project, scale up to small desk top facility will be carried out, for air/aqueous-foam flow at low pressures.

DELIVERABLES:

- Portable, flexible and easy to operate facility for foam breaking demonstrations and data acquisitions, which can be used also by the industry.
- Experimental data on the effect of different operational conditions (pressure, type of oil-phase, viscosity foamy crude) on the foam breaking process in the GLCC.
- Design criteria for foam breaking in the GLCC.
- An improved mechanistic model for predicting the operational envelope for foam breaking in the GLCC.

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