

## ***8. PERFORMANCE ANALYSIS OF LIQUID CARRY-OVER IN GLCC<sup>®</sup> FOR 3-PHASE FLOW***

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**SPONSOR:** NSF-I/UCRC, TUSTP

### **INTRODUCTION:**

There have been very few studies in the past investigating the liquid carry-over phenomena in GLCC<sup>®</sup>. Earlier studies were basically on 2-phase flow of either pure water-air or pure oil-air only. The effect of oil properties and the effect of watercut on the liquid carry-over phenomena in GLCC have not been explored.

### **OBJECTIVES:**

- To study the effect of water cut and oil properties on the operational envelop for liquid carry-over
- To develop a mechanistic model for predicting the operational envelop for liquid carry-over in GLCC for 3-phase flow

### **COMPLETED WORK:**

- Experimental Investigations have been carried out for different watercuts of 0%, 25%, 50%, 75%, and 100% with light oil of viscosity 20 cp at 77°F and heavy oil of 750 cp at 77°F.
- Experimental Investigations have been conducted on Zero-Net Liquid Hold up for pure oil and pure water i.e. 0% and 100% watercuts at 25 psia.
- Mechanistic model for predicting the annular mist velocity has been completed and verified with the above mentioned experimental data.

### **CURRENT WORK:**

- A mechanistic model to capture the effects of physical phenomena in the churn region of the operational envelop is currently under development.

### **FUTURE WORK:**

- Develop a design criteria for operational envelop for liquid carry-over in GLCC for 3-phase flow

### **DELIVERABLES:**

- Experimental Data Base
- Video clips taken during the experiments
- Mechanistic model
- Design Criteria
- Semi Annual Advisory Board Meeting Reports
- Final Report

**ANTICIPATED GRADUATION DATE:** December 2006