



FLUIDIZATION SEMINAR AND WORKSHOP

SPRING, TEXAS

NOVEMBER 14TH-17TH, 2023

(ALL TIMES CDT)

TUESDAY

7:30 AM	BREAKFAST (PROVIDED)
8:00 AM	REGISTRATION
8:15 AM	INTRODUCTION TO PSRI AND ITS TECHNICAL PROGRAMS
8:30 AM	A. INTRODUCTION AND OVERVIEW
	1. INTRODUCTION, TERMINOLOGY, AND PARTICULATE PROPERTIES
	2. FLUIDIZATION REGIMES AND TRANSITIONS
10:30 AM	BREAK
10:45 AM	3. HYDRODYNAMICS OF FLUIDIZED BEDS
	▪ EFFECTS OF TEMPERATURE AND PRESSURE
12:00 PM	LUNCH (PROVIDED)
12:45 PM	4. GAS AND SOLIDS MIXING
2:45 PM	BREAK
3:00 PM	5. GAS SOLIDS CONTACTING, REACTION, MODELLING AND SCALE-UP
	6. HEAT TRANSFER
5:00 PM	ADJOURN

WEDNESDAY

- 7:30 AM** **BREAKFAST (PROVIDED)**
- 8:00 AM** **B. OVERVIEW OF INDUSTRIAL APPLICATIONS**
- 9:00 AM** **C. GRIDS – GAS DISTRIBUTORS**
- INTRODUCTION TO GRIDS (PRESSURE DROP ACROSS GRID)
 - DESIGN OF VARIOUS TYPES OF GRIDS
 - PERFORATED PLATE
 - PIPE/SPARGER
 - EFFECT OF SHROUDS
- 10:00 AM** **BREAK**
- 10:15 AM** **C. GRIDS – GAS DISTRIBUTORS (CONTINUED)**
- JET PENETRATION
 - EFFECTS OF TEMPERATURE AND PRESSURE
- 11:30 AM** **D. WORKSHOP ON GRID DESIGN**
- 12:00 PM** **LUNCH (PROVIDED)**
- 1:00 PM** **E. PARTICLE ENTRAINMENT & ELUTRIATION**
- INTRODUCTION
 - MECHANISMS OF EJECTION INTO FREEBOARD
 - SOLID FLUX PROFILE AND TDH
 - ENTRAINMENT CORRELATION FOR BUBBLING & TURBULENT BEDS
- 2:00 PM** **BREAK**
- 2:15 PM** **E. PARTICLE ENTRAINMENT & ELUTRIATION (CONTINUED)**
- EFFECTS OF GEOMETRY
 - ENTRAINMENT FROM RISERS
 - EFFECTS OF TEMPERATURE AND PRESSURE
- 2:45 PM** **F. WORKSHOP ON ENTRAINMENT**
- FCC/POLYETHYLENE EXAMPLES
- 3:15 PM** **G. CYCLONE DESIGN**
- PRINCIPLE OF OPERATION
 - NON-UNIFORM CYCLONES
- 5:00 PM** **ADJOURN**

THURSDAY

7:30 AM **BREAKFAST (PROVIDED)**

8:00 AM **G. CYCLONE DESIGN (CONTINUED)**

- **DIPLEG PRESSURE BALANCE**
- **FLAPPER & TRICKLE VALVES**
- **EFFECT OF DIFFERENT CONFIGURATIONS**
- **EFFECTS OF TEMPERATURE AND PRESSURE**
- **DESIGN PROCEDURE**
- **COLLECTION EFFICIENCY**

9:30 AM **BREAK**

9:45 AM **H. WORKSHOP ON CYCLONES**

- **CYCLONE DESIGN CALCULATIONS**
- **CYCLONE VIDEOS**

10:30 AM **I. STANDPIPES**

- **THEORY OF OPERATION**
- **TYPES OF STANDPIPES**
- **AERATION EFFECTS**
- **STANDPIPE CAPACITY**
- **ANGLED STANDPIPES**

12:00 PM **LUNCH (PROVIDED)**

1:00 PM **MODELING EXPANDED WITH CPFD SOFTWARE**

2:15 PM **BREAK**

2:30 PM **I. STANDPIPES (CONTINUED)**

- **STRIPPING**
- **NON-MECHANICAL VALVES**
- **STANDPIPE CALCULATIONS**

5:00 PM **ADJOURN**

FRIDAY

7:30 AM	BREAKFAST (PROVIDED)	
8:00 AM	J.	DILUTE-PHASE PNEUMATIC CONVEYING AND CIRCULATING FLUIDIZED BEDS <ul style="list-style-type: none">▪ VERTICAL & HORIZONTAL FLOW PHASE DIAGRAMS▪ PRESSURE DROP CALCULATIONS▪ CALCULATION OF CHOKING, SALTATION, AND SLIP VELOCITIES▪ FAST FLUIDIZATION, CIRCULATING FLUIDIZED BEDS▪ BENDS▪ EFFECT OF DIAMETER▪ EFFECT OF PRESSURE▪ FEEDING CONSIDERATIONS
10:00 AM	BREAK	
10:15 AM	K.	DENSE-PHASE PNEUMATIC CONVEYING <ul style="list-style-type: none">▪ PACKED BED, FLUIDIZED-BED FLOW▪ SLUG FLOW▪ SELECTION OF EQUIPMENT TYPE
12:00 PM	LUNCH (PROVIDED)	
1:00 PM	L.	PARTICLE ATTRITION <ul style="list-style-type: none">▪ TYPES OF ATTRITION▪ ATTRITION TESTING AND MODELING
2:00 PM	M.	MODELING GRANULAR-FLUID SYSTEMS <ul style="list-style-type: none">▪ TYPES OF MODELS▪ COMMON PITFALLS
2:45 PM	BREAK	
3:00 PM	M.	MODELING GRANULAR-FLUID SYSTEMS (CONTINUED)
4:00 PM	CONCLUSION OF SEMINAR	