



FLUIDIZATION SEMINAR AND WORKSHOP CHICAGO, ILLINOIS, USA SEPTEMBER 26TH – 29TH, 2023

(ALL TIMES CDT)

TUESDAY, SEPTEMBER 26TH, 2023

7:15 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

- 7:15 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**

7:15 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 MODELING EXPANDED WITH CPFD SOFTWARE

11:45 AM LUNCH (PROVIDED)

12:45 PM TOUR OF PSRI RESEARCH FACILITIES

2:30 PM I. STANDPIPES

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

5:00 PM ADJOURN

7:15 AM	BREAKFAST (PROVIDED)
8:00 AM	I. STANDPIPES (CONTINUED) <ul style="list-style-type: none">○ STRIPPING○ NON-MECHANICAL VALVES○ STANDPIPE CALCULATIONS
9:45 AM	BREAK
10:00 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
12:00 PM	LUNCH (PROVIDED)
12:45 PM	K. DENSE-PHASE PNEUMATIC CONVEYING <ul style="list-style-type: none">▪ PACKED BED, FLUIDIZED-BED FLOW▪ SLUG FLOW▪ SELECTION OF EQUIPMENT TYPE
1:30 PM	L. PARTICLE ATTRITION <ul style="list-style-type: none">▪ TYPES OF ATTRITION▪ ATTRITION TESTING AND MODELING
2:30 PM	M. MODELING GRANULAR-FLUID SYSTEMS <ul style="list-style-type: none">▪ TYPES OF MODELS▪ COMMON PITFALLS
3:00 PM	BREAK
3:15 PM	M. MODELING GRANULAR-FLUID SYSTEMS (CONTINUED)
4:30 PM	CONCLUSION OF SEMINAR