Particulate Solid Research, Inc.

FLUIDIZATION SEMINAR AND WORKSHOP
CHICAGO, ILLINOIS, USA
SEPTEMBER 10TH – 13TH, 2024

(ALL TIMES CDT)

TUESDAY

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)		
1:00 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

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

4:15 PM G. CYCLONE DESIGN

- PRINCIPLE OF OPERATION
- NON-UNIFORM CYCLONES

5:00 PM ADJOURN

THURSDAY

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

11:30 AM **LUNCH (PROVIDED)**

12:30 PM **MODELING EXPANDED WITH CPFD SOFTWARE**

1:30 PM **TOUR OF PSRI RESEARCH FACILITIES**

3:15 PM **I. STANDPIPES**

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

5:00 PM **ADJOURN**

FRIDAY

8:00 AM	I.	STANDPIPES (CONTINUED)

- STRIPPING
- NON-MECHANICAL VALVES
- STANDPIPE CALCULATIONS

9:45 AM	BREAK	
10:00 AM	J.	DILUTE-PHASE PNEUMATIC CONVEYING AND CIRCULATING FLUIDIZED BEDS

- 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

- PACKED BED, FLUIDIZED-BED FLOW
- SLUG FLOW
- SELECTION OF EQUIPMENT TYPE

1:30 PM	L.	PARTICLE ATTRITION

- TYPES OF ATTRITION
- ATTRITION TESTING AND MODELING

2:30 PM	M.	MODELING GRANULAR-FLUID SYSTEMS

- TYPES OF MODELS
- COMMON PITFALLS

3:00 PM	BREAK	
3:15 PM	M.	MODELING GRANULAR-FLUID SYSTEMS (CONTINUED)
4:30 PM	CONCLUSION OF SEMINAR	