



# FLUIDIZATION SEMINAR AND WORKSHOP CHICAGO, ILLINOIS, USA SEPTEMBER 18<sup>TH</sup> – 21<sup>ST</sup> 2017

(ALL TIMES CDT)

## MONDAY, SEPTEMBER 18<sup>TH</sup> 2017

7:30 AM	BREAKFAST (PROVIDED)
8:00 AM	REGISTRATION
8:20 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 AND MASS TRANSFER
5:00 PM	ADJOURN

- 8:00 AM      **BREAKFAST (PROVIDED)**
- 8:30 AM      **B.      OVERVIEW OF INDUSTRIAL APPLICATIONS**
- 9:30 AM      **C.      GRIDS AND PARTICLE ATTRITION**
- **INTRODUCTION TO GRIDS (PRESSURE DROP ACROSS GRID)**
  - **DESIGN OF VARIOUS TYPES OF GRIDS**
    - **PERFORATED PLATE**
    - **PIPE/SPARGER**
    - **EFFECT OF SHROUDS**
  - **JET PENETRATION**
    - **EFFECTS OF TEMPERATURE AND PRESSURE**
- 10:30 AM     **BREAK**
- 10:45 AM     **C.      GRIDS AND PARTICLE ATTRITION (CONTINUED)**
- **SOURCES OF ATTRITION**
  - **PARTICLE ATTRITION AT SUBMERGED JETS**
    - **GRID DESIGN**
    - **EFFECTS OF TEMPERATURE AND PRESSURE**
  - **PARTICLE ATTRITION IN CYCLONES**
- 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**
  - **CORRELATION FOR BUBBLING & TURBULENT BEDS**
- 3:00 PM      **BREAK**
- **ENTRAINMENT CORRELATION**
  - **EFFECTS OF GEOMETRY**
  - **ENTRAINMENT FROM RISERS**
  - **EFFECTS OF TEMPERATURE AND PRESSURE**
- 4:15 PM      **F.      WORKSHOP ON ENTRAINMENT**
- **FCC/POLYETHYLENE EXAMPLES**
- 5:00 PM      **ADJOURN**

- 7:30 AM            BREAKFAST (PROVIDED)**
- 8:00 AM            G.        CYCLONE DESIGN**
- PRINCIPLE OF OPERATION
  - DIPLEG PRESSURE BALANCE
  - FLAPPER & TRICKLE VALVES
  - NON-UNIFORM CYCLONES
  - EFFECT OF DIFFERENT CONFIGURATIONS
  - EFFECTS OF TEMPERATURE AND PRESSURE
- 10:00 AM            BREAK**
- 10:15 AM            G.        CYCLONE DESIGN (CONTINUED)**
- DESIGN PROCEDURE
  - COLLECTION EFFICIENCY
- 11:30 AM            LUNCH (PROVIDED)**
- 12:30 PM            TOUR OF PSRI RESEARCH FACILITIES**
- 2:45 PM            H.        WORKSHOP ON CYCLONES**
- CYCLONE DESIGN CALCULATION
- 3:00 PM            I.        STANDPIPES**
- THEORY OF OPERATION
  - TYPES OF STANDPIPES
  - AERATION EFFECTS
  - STANDPIPE CAPACITY
  - ANGLED STANDPIPES
  - STRIPPING
  - NON-MECHANICAL VALVES
  - STANDPIPE CALCULATIONS
- 5:00 PM            ADJOURN**

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

- 8:00 AM            J.        DILUTE-PHASE PNEUMATIC CONVEYING**
- 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

**10:15 AM            BREAK**

- 10:30 AM            K.        DENSE-PHASE PNEUMATIC CONVEYING**
- PACKED BED, FLUIDIZED-BED FLOW
  - SLUG FLOW
  - SELECTION OF EQUIPMENT TYPE

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

- 1:00 PM            L1.       PARTICLE ATTRITION**
- TYPES OF ATTRITION
  - ATTRITION TESTING AND MODELING

- 2:00 PM            L2.       MODELING GRANULAR-FLUID SYSTEMS**
- TYPES OF MODELS
  - COMMON PITFALLS

**3:00 PM            BREAK**

- 3:15 PM            L2.       MODELING GRANULAR-FLUID SYSTEMS (CONTINUED)**

**4:30 PM            CONCLUSION OF SEMINAR**