



FLUIDIZATION SEMINAR AND WORKSHOP

HOUSTON, TEXAS, USA

JANUARY 7TH – 10TH, 2020

TUESDAY, JANUARY 7TH 2020

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|-----------------|---|
| 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 |

- 7:30 AM **BREAKFAST (PROVIDED)**
- 8:00 AM **B. OVERVIEW OF INDUSTRIAL APPLICATIONS**
- 9:00 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**
- 10:00 AM **BREAK**
- 10:15 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**
- 3:15 PM **E. PARTICLE ENTRAINMENT & ELUTRIATION (CONTINUED)**
- **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**
- **DIFFERENT CYCLONE TYPES**
- **EFFECT OF DIFFERENT CONFIGURATIONS**
- **EFFECTS OF TEMPERATURE AND PRESSURE**
- **DESIGN PROCEDURE**
- **COLLECTION EFFICIENCY**

10:00 AM BREAK

10:15 AM G. CYCLONE DESIGN (CONTINUED)

- **DESIGN PROCEDURE**
- **COLLECTION EFFICIENCY**
- **CYCLONE DESIGN CALCULATION**

11:15 AM H. WORKSHOP ON CYCLONES

12:00 PM LUNCH (PROVIDED)

1:00 PM I. STANDPIPES

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

3:00 PM BREAK

3:15 PM I. STANDPIPES (CONTINUED)

- **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 & CIRCULATING FLUIDIZED BEDS**
- VERTICAL & HORIZONTAL FLOW
 - PRESSURE DROP CALCULATIONS
 - CALCULATION OF CHOKING, SALTATION
 - BENDS
 - EFFECT OF DIAMETER
 - EFFECT OF PRESSURE
 - FEEDING CONSIDERATIONS
- 10:00 AM** **BREAK**
- 10:15 AM** **K. DENSE-PHASE PNEUMATIC CONVEYING**
- PACKED-BED FLOW
 - FLUIDIZED-BED FLOW
 - SLUG FLOW
- 11:30 AM** **LUNCH (PROVIDED)**
- 12:30 PM** **MODELING EXPANDED WITH CFPD SOFTWARE**
- 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)**
- 5:00 PM** **CONCLUSION OF SEMINAR**