

# MACHINERY and TECHNOLOGIES MASTERED

## Stephen Randolph, P.E.

- Agitation
- Chromatographic separation
- Conveyors and conveying
  - Bucket
  - Drag
  - Pneumatic
    - ✓ Dense phase
    - ✓ Light phase
    - ✓ Pressure
    - ✓ Vacuum
  - Screw
- Couplings
  - Flexible
  - Hydraulic
  - Rigid
- Distillation
- Dryers
  - Flash
    - ✓ Column
    - ✓ Ring
- Dryers (continued)
  - Rotary
    - ✓ Shell/tube
      - Stationary shell
      - Rotating shell
    - ✓ Shell
- Environmental regulatory equipment
- Enzymatic conversion
- Evaporation
- Failure analysis
- Fermentation
- Filtration
  - Pressure
  - Vacuum
  - Static
  - Rotary
- Hazardous chemical storage/handling
- Heat exchangers and heat transfer
  - Shell/tube
  - Plate
  - spiral

# MACHINERY and TECHNOLOGIES MASTERED

## Stephen Randolph, P.E.

- Hydraulics
- Hydroclones
- Ion exchange
  - Mixed Bed
  - Six Bed
- Isomerization
- Machine design
- Materials of construction
  - Inorganic chemicals
  - Organic chemicals
  - Some biological environments
- Materials handling
  - Automated guided vehicles
  - Conveyors
  - Stacker cranes
- Milling
- Pumps, piping and valving
  - Authored very comprehensive standards
  - High and low pressure
- High speed equipment
  - Mills
    - ✓ Horizontal
    - ✓ Vertical
  - Basket centrifuges
    - ✓ Horizontal
    - ✓ Vertical
- Low speed equipment
  - Rotary steam tube dryers
  - Direct-fired dryers
  - Presses
- Sifting and screening
- Stress analysis
- System integration, incl. automation
- Utilities
  - High pressure boilers
  - Cooling towers
  - Cogeneration
- Pressure vessels and tanks
  - ASME pressure
  - Atmospheric and vacuum
  - Some DIN and BS