PiControl Solutions LLC

Course Name: Energy Balances

Course #: CHE400C (Self-Paced Computer-Based Training Course)

Duration:	**Self-paced**
Audience:	**Control Room Operators, Process Engineers, Technicians, Application Engineers, Instrument Engineers and Supervisors**
Prerequisites:	**None**
Course Material:	**CBT (computer-based training) software**

Course Description and Objectives:
This course is an excellent refresher for process engineers, control engineers and managers – those who took college classes but now need a refresher to review and remember important concepts. This course is also an excellent introduction and knowledge-booster for operators and technicians who want to learn more about the academic theory and principles of energy balances.

Learning Outcomes:
Master the concepts on energy balances which are so critical and useful in process design and plant operation. Use the knowledge to perform calculations and interact more intelligently during design and troubleshooting meetings at the plant. The knowledge and skills will be of immediate value and use on the job in the control room or a design office.

Course Chapters:

1. Heat Effects
    a. Without Phase Change
    b. With Phase Change
    c. With Water & Steam
2. General Energy Balance Equation
    a. First Law of Thermodynamics
    b. Application To Processes
    c. Mechanical Energy Balance
3. Energy Balances With Reaction
    a. Enthalpy of Formation
    b. Enthalpy of Reaction
    c. Enthalpy of Combustion
    d. Adiabatic Flame Temperature
    e. Application To Processes
4. Enthalpy of Solution & Mixing
5. Application To Processes

6. Heating Values of Fossil Fuels
    a. Coal
    b. Petroleum
    c. Gas