Pilot Plant and Laboratory Safety
February 23–25, 2015
Houston, Texas

A course designed specifically for safety personnel, engineers, scientists, contractors, supervisors, and operators who need to understand the basics of pilot plant and laboratory safety.

“THIS COURSE IS VERY VALUABLE TO ANYONE IN THE SAFETY FIELD.”

- Learn how to develop and implement an effective safety program for your labs and pilot plants, including safety reviews, inspections, and standards
- Examine applicable safety codes, including OSHA, NFPA, and ASME
- Focus on code compliance
- Review hazard analysis and risk assessment principles
- Examine safety system design and use

A valuable course for anyone involved in academic, corporate, and government research and training laboratories and pilot plants

Please share this brochure with colleagues who may benefit from attending this course.
Examine Practical Concepts
This detailed course is designed for safety personnel, engineers, scientists, contractors, supervisors, and operators who are involved in the safe design and operation of laboratories and pilot plants. You will learn how to develop and implement an effective safety program for your labs and pilot plants. You will gain a comprehensive overview of:
- Applicable safety codes, including OSHA, NFPA, and ASME
- Flammability basics and how they influence safety and safety programs
- Safety systems and interlocks
- Gas monitoring systems

Learn How To
- Perform risk assessments and identify hazards
- Balance space requirements and safety
- Achieve code compliance
- Implement effective and reliable safety reviews, inspections, and standards
- Design safety procedures that meet your goals

Explore Critical Issues
This course provides information that you can put to work immediately, including how to:
- Establish effective safety reviews, inspections, and standards
- Perform risk assessments and identify hazards
- Select and install the proper instrumentation, including interlocks and gas monitoring systems
- Understand and implement applicable safety codes, including:
  - NFPA
  - OSHA
  - ASME
- Balance space and safety requirements
- Anticipate potential problem areas

Attend and Benefit
Engineers and scientists who are involved in pilot plant and laboratory safety will learn the essentials and critically examine ways to implement meaningful safety procedures—including reviews, inspections, and standards—to achieve code compliance and safe operation. The course will be especially valuable to those responsible for safe procedures and operation in the design, construction, and operation of pilot plants and laboratories in the following industries:
- Chemical, petrochemical, agrichemical, and specialty chemical
- Biotechnology, biochemical, and fermentation
- Pharmaceuticals and cosmetics
- Food processing
This course will be valuable to those involved in academic, private, and government research and training laboratories.
This course will be especially valuable to those who are:
- New to the pilot plant and laboratory and need to learn the codes and equipment applicable to safety in these units
- Responsible for designing safe pilot plants and laboratories
- Managing the safety aspects of pilot plants and laboratories
The novice will be brought up to speed quickly and will benefit from the breadth and detail of the course. More experienced personnel will find the overall approach and breadth will help them better understand the complex interrelations between all of the different areas.

Your Instructor
Richard P. Palluzi is a Distinguished Engineering Associate at ExxonMobil Research and Engineering where he is responsible for the design, construction, and support of pilot plants and laboratories for ExxonMobil’s research site in Clinton, New Jersey. Palluzi also is a consultant on issues related to pilot plants throughout ExxonMobil worldwide. He has a bachelor of engineering degree and a master of engineering degree in chemical engineering from Stevens Institute of Technology. He is the author of two books, 30 articles, and 40 presentations on all phases of pilot plant and laboratory safety and operations. Palluzi is a past chair of the American Institute of Chemical Engineers (AIChE) Pilot Plant Committee and the Clinton site’s Safe Operations Team and was responsible for reviewing and approving all pilot plant and laboratory installations and operations. He chaired Exxon Mobil’s Pilot Plant and Laboratory Safety Standards Committee and is responsible for the development and dissemination of more than 100 internal company standards on pilot plant design and construction. He has consulted for the Department of Energy and the Department of Defense on research-related issues. Palluzi is a member of the AIChE, the International Society for Automation, the American Society of Safety Engineers, and the National Fire Protection Association where he serves on the committees on NFPA-45 Fire Protection for Laboratories Using Chemicals and NFPA-55 Industrial and Medical Gases.

“I received new ideas and information specifically on safety in the lab. I am more aware of what needs to be done when constructing a new pilot plant.”
Laboratory Supervisor

“I gained a lot of knowledge regarding NFPA codes, safety reviews, and hazard assessments.”
Senior Scientist

“By far, one of the best courses. This course is very valuable to anyone in the safety field.”
Research Scientist

“This course brought many things to my attention. It exposed my organization’s weaknesses with safety audits and hazard analysis.”
Research Engineer

ENROLL ONLINE TODAY! Or visit our website.
Welcome and Introduction
Elaine M. Bower, FAIChE
Program Director
Department of Engineering
Professional Development
University of Wisconsin–Madison

Safety Reviews
• Types of safety reviews and their purposes
• Problems with safety reviews
• Ensuring safety reviews meet their goals

Safety Inspections
• Types of safety inspections and their purposes
• Problems with safety inspections
• Developing an effective safety inspection program

Safety Standards
• Typical safety standards
• Problems with safety standards
• Developing effective safety standards

Flammability Basics
• NFPA classification of flammable and combustible liquids
• Flash points
• Autoignition temperatures
• Explosive limits
• Oxygen-enriched atmospheres

Interlocks and Safety Systems
• Different safety system approaches
• Types of interlocks
• Failsafe design approaches

Hazard Analysis and Risk Assessments
• Types of hazard analysis
• Principles of risk assessment

Gas Monitoring Systems
• Types of monitoring systems
• Problems with gas monitoring systems
• Ensuring an effective installation

Code Compliance
• Code overview
• Consensus standards
• Legal standards
• Resolving code disputes

NFPA-70: National Electric Code
• Overview
• Definitions of hazardous areas
• Determining hazardous areas
• Summary of hazardous area requirements

NFPA-30: Flammable and Combustible Liquids Code
• Detailed review by section
• Implications for research operations

NFPA-496: Electrical Enclosures in Hazardous Locations
• Overview
• Implications for research operations
• Purged enclosure design considerations
• Control room design considerations
• Problem areas

NFPA-45: Safety in Laboratories Using Flammable Materials
• Detailed review by section
• Implications for research operations

Space Considerations
• Types of research space
• Safety considerations for each type of surface
• Interior vs. exterior locations
• Laboratory vs. pilot plant areas
• Barricades vs. other measures
• Barricade design and operational considerations

Specific Safety Problems
• Gas cylinders
• Relief devices
• Glass equipment
• Hoods and ventilated boxes
• Flexible metal hoses
• Flow limiting devices
• Sight glasses
• Pressure testing
• Pressure gauges
• Aisles

Summary

Course Schedule
Registration and course will be held at The Courtyard by Marriott Houston NASA/Nassau Bay 18100 Saturn Lane Houston, TX
Day 1
8:00 a.m. to 8:15 a.m. Registration
8:15 a.m. to 4:30 p.m. Class
Day 2
8:00 a.m. to 4:30 p.m. Class
Day 3
8:00 a.m. to 12:00 p.m. Class
Midmorning and midafternoon refreshment breaks and noon lunch are provided day 1 and 2.

Pilot Plant Certificate Series
The Pilot Plant Certificate (PPC) series features practical, problem-solving courses that help new and experienced professionals keep pace with the latest innovations, codes, and technology in industrial pilot plants, laboratories, and research facilities.

You can earn your PPC by attending four core courses and one elective from the course list. Attend as many courses as you wish, in any order, without obligation to the certificate. The choice is yours.

Core Courses
• Pilot Plant Design, Construction, and Operation
• Pilot Plant Equipment
• Pilot Plant and Laboratory Safety
• Hazard Analysis and Risk Assessment for Pilot Plants, Laboratories, and Research

Elective Courses
• Laboratory Design
• Process Safety: The Technical Basis

How You’ll Benefit
The PPC offers top-quality training for pilot plant professionals, researchers, project engineers, EHS professionals, supervisors, operators, and professionals with related research, product, process, or facility responsibilities. Courses cover relevant pilot plant and laboratory topics including safety, codes, equipment, design, construction, start-up, and operations.

Take the Next Step
Industry experts and faculty with firsthand experience guarantee you a dynamic learning experience at an affordable price. Discuss challenges, get answers, share ideas, and return to your job a more knowledgeable and valuable professional.

For more information, email Elaine Bower or call her at 800-462-0876.
Four Easy Ways to Enroll

Internet:
epd.engr.wisc.edu/webR146

Phone:
800-462-0876 or
608-262-1299 (TDD 265-2370)

Mail to:
The Pyle Center
Attn: Engineering Registration
702 Langdon Street
Madison, Wisconsin 53706

Fax:
800-442-4214 or
608-265-3448

Course Information

☐ Please enroll me in Pilot Plant and Laboratory Safety
Course #R146 February 23–25, 2015 in Houston, Texas Fee: $1795

☐ Team Discount: $1650 per person when two or more enroll
from the same organization.

☐ I cannot attend at this time. Please send me brochures on future courses.

Limited Enrollment

Personal Information (Please print clearly.)

Name ________________________________
Title _________________________________
Company ______________________________
Address ________________________________
City/State/Zip ____________________________
Phone (_____) ____________________ Fax (_____) __________
E-mail ________________________________

Additional Enrollees

Name ________________________________
Title _________________________________
E-mail ________________________________

Billing Information

☐ Bill my company ☐ P.O. or check enclosed (Payable in U.S. funds to UW–Madison)

Cardholder's Name ________________________________
Card No. ____________________ Expire ___/___/___

UW# ____________________ From mailer panel.

Future Courses

For information about the following courses, contact Elaine Bower, Program
Director, at 800-462-0876 or e-mail her at bower@engr.wisc.edu

Successful Liquid Mixing Scale-up Methods
February 10–12, 2015
Course #R035

Spray Technology for Chemical and
Petrochemical Applications
February 26, 2015
Course #R147

The Art and Science of Industrial Mixing
April 14–16, 2015
Course #R035

Dryer Technology
April 28–29, 2015
Course #R024

Atomization and Spray Technology: Focus on Spray Drying
April 30, 2015
Course #R025

Need to Know More?

Call toll free 800-462-0876 and ask for
Program Director: Elaine M. Bower
bower@engr.wisc.edu

Program Associate: Theresa Rodger
roger@epd.engr.wisc.edu

Or e-mail custserv@epd.engr.wisc.edu

General Information

Fee of $1795 Covers
Notebook, course materials, break refreshments, lunches, and certificate. We do not publish proceedings. Course materials are distributed only to participants.

Cancellation If you cannot attend, please notify us by February 16, 2015, and we will refund your fee. Because this course has limited enrollment, cancellations received after this date and no-shows are subject to the full course fee of $1795. You may enroll a substitute at any time before the course starts.

Location and Accommodations This course will be held at the Courtyard by Marriott Houston NASA/Nassau Bay, 18100 Saturn Lane, Houston, TX. We have reserved a block of guest rooms (rates starting at $121) at Courtyard by Marriott Houston NASA/Nassau Bay, located at 18100 Saturn Lane, Houston, TX. Call toll free 888-236-2427 or ask for group code PPP. Room requests after February 9, 2015 will be subject to availability. Other fees and restrictions may apply.

Earn Continuing Education Credits

By participating in this course, you will earn 20 Professional Development Hours (PDH) or 2.0 Continuing Education Units (CEU)