Laboratories for the 21st Century (Labs21®) Introduction to High-Performance, Low-Energy Design and Optimizing Laboratory Ventilation Rates

April 6, 2010
08:00 AM-04:30 PM

To be held at:
AstraZeneca Pharmaceuticals LP
35 Gatehouse Drive
Waltham, MA 02451

Sponsored By:

Training Overview

This course is a full-day workshop that introduces strategies for designing and constructing sustainable laboratories in both new and existing facilities. All are welcome to attend these discussions that will incorporate many aspects of sustainable design in laboratories.

Presenter

Mr. James Coogan, Siemens Building Technologies, registered course instructors with I^2SL. I^2SL has been selected by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) to coordinate Labs21 Workshops

Benefits

- Laboratory professionals will learn sustainable design practices that can be implemented in daily operations.
- Attendees will receive Continuing Education Credits (typically six credits for a full-day workshop and three credits for a half-day workshop) for their participation in any Labs21 Workshop.
- Workshops reinforce an organization's commitment to sustainability.
- If the techniques learned in the workshops are utilized in a design project, there can be direct cost and energy savings.

Who Should Attend

- Plant and Facility Managers
- Energy and Mechanical Engineering staff
- Operation and Maintenance staff
- Energy Professionals
- Institutional, Industrial and Commercial Laboratory Facilities
- Designers and Architects

Agenda

8:00-8:30	**Registration and Continental Breakfast**
8:30-8:40	**Introduction**
	Part 1 – Introduction to High-Performance, Low-Energy Design

8:40-9:00	**Labs21 Video: Improving the Performance of Our Nation's Laboratories**
9:00-9:40	**Session 1: Starting Right: Planning and Programming for High Performance Laboratories**
	• Introduction
	The energy challenge in labs
	Design process considerations for labs
	• Programming and Planning strategies for high-performance labs
	Know the role of codes and standards
	Set verifiable energy efficiency and sustainability goals
	Optimize space requirements for users
	Match exhaust devices and equipment to user needs
	Layout rationally for systems integration
	Select utility distribution scheme for desired flexibility
9:40-10:00	**Session 2: Energy Efficient Lab HVAC**
	• Problem Analysis
	Minimize the Loads
	Determine load variability
10:00-10:15	**Break**
10:15-11:10	**Session 2: Energy Efficient Lab HVAC** (cont'd)
	• Solution Implementation
	Use an adjustable system to match the load
	Maximize HVAC efficiency
	Promote safety relationship
	• Conclusion
	Summary
	Overcoming Barriers
	Right-sizing
11:10-11:40	**Session 3: Lighting and Daylighting**
	• Importance of Proper Lighting
	• Energy-Efficient Lighting Strategies
	• Lighting Controls
	• Daylighting
11:40-12:00	**Concluding Remarks**

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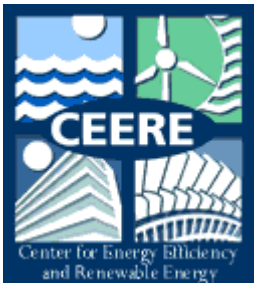

12:00-1:00	**Lunch**
1:00-1:05	**Introduction**

• Present Basic Goal: Optimize ventilation airflow and reduce energy use while maintaining or improving safety.

• Present Objectives to Achieve Goal: This workshop reviews methods to achieve this Goal including: processes, practices, and strategies. It is not intended to be a specification on how to set a lab's ventilation rate – purpose is to highlight methods that are focused on reducing energy use.

Exercise #1: What influences a lab's mixing factor, K?

Entire-group, mini-charrette exercise.

1:05-2:15 **Standard Design Practice**

• Overview of Design Process: Review decisions and priorities that usually lead to standard design practice.

• Process Review Summarize codes and standards in order to provide context for the best practice strategies. Overview of design intent, authority having jurisdiction, design-level support.

• Exercise #2 What are additional goals and issues?

Small-group exercise. Share experiences. Designate person to report-out.

• Choose Design Approach and Apply Standard Design: Briefly described how they are used in standard practice.

2:15-2:30 **Break**

2:30-4:00 **Good Design Practice**

• Main workshop focus.

• Safety Evaluation Relating to Energy Efficiency: Briefly describe how designer balances safety and energy efficiency.

• Exercise # 3: Compare device qualities versus experimental procedures

Small-group exercise. Choose and discuss one experimental procedure. Designate person to report-out.

• Environmental Evaluation Relating to Energy Efficiency: Includes review of exhaust devices and their energy-efficiency attributes.

• Exercise # 4: Compare safety evaluation results versus devices per lab

Entire-group exercise. Discuss relative energy efficiency of possible devices as they relate to experimental procedures discussed in Exercise #3.

• Design Refinements: Good Practice design refinements are presented and discussed.

• Exercise # 5: Develop Good-practice design refinements

Small-group exercise. Choose one design refinement and discuss in detail. Designate person to report-out.

4:00-4:20	**Better Design Practice** • Special design approaches and evaluation methods that include modeling and simulations of lab spaces. • Tracer Gas Evaluations • Neutrally-Buoyant Helium Bubbles Evaluations • Computational Fluid Dynamic (CFD) Models • Exercise # 6: Better Practice: Modeling and simulation discussion Entire-group exercise. Discuss experiences with and expectations from advanced modeling and simulation techniques.
4:20-4:30	**Wrap-up and Conclusion** • Summarize workshop intent • Resolve ventilation rate • Develop laboratory module • Finalize ventilation design • Conclusion

Workshop Cost and Registration

All attendees are asked to pay for registration to reserve a spot. Registration includes: program materials, Continental Breakfast and Lunch.

- Registration cost **$150.00** per person
- Registration must be done before **March 31**, **2010 Due to Security no walks allowed**
- Advance registration is **required**!
- Cancellations 5 days prior to event are non-refundable.
- Payment can be made by credit online or by check
- Checks will be accepted at the door.