

Course Number: BOC 200

Course Title: Building Operator Certification Level II

Course Hours: 61 hours, or 6.1 CEU's

Course Description

To earn a Level II Training Certificate of Completion, participants must attend five core classes and one supplemental class, complete class tests and assigned projects. The projects include a culminating short presentation to classmates and the instructor on a scoping report for their building (BOC 2005).

BOC Level II coursework prepares building operators to evaluate the operational performance of their buildings with a focus on improving energy efficiency. Through their project assignments, operators learn how to collect and analyze building data in order to prepare a building walk-through plan to identify opportunities to improve performance. Optimizing HVAC control systems for energy efficiency is highlighted with an emphasis on equipment sequence of operation and functional testing. Students apply the data collection and analysis steps to their own building through a 5-part set of project assignments completed between class sessions. Specific building information is required in order to complete project assignments.

Weeks 1 and 2: BOC 2001 Building Scoping for Operational Improvements

In this two-week class, participants will learn about the Building Operator Certification Level II training program and the requirements for earning the Level II Certificate. Participants will also learn how to gather building data and create a building walkthrough plan to find opportunities for improving their building's efficiency and operational performance. Topics include the characteristics of high-performance buildings, data gathering tools such as a building operations map and occupant interview guide, four common opportunities for operational improvement, and the steps for completing a building walkthrough.

Week 3: BOC 2002 Optimizing HVAC Controls for Energy Efficiency

Participants will learn about strategies for controlling the operation of HVAC systems to improve building comfort and energy efficiency. Topics include optimization strategies, reviewing and writing sequences of operation (SoO) for

HVAC system components, procedures for functionally testing the control system, and future trends in building controls. A combination of lecture, class discussion, and small group activities will prepare operators to write a SoO for an HVAC system in their building and to develop a procedure for testing the control system.

Week 4: BOC 2003 Introduction to Building Commissioning

This course introduces the building commissioning process for new and existing buildings with an emphasis on existing building commissioning and the building operator's role. Topics include an overview of commissioning types, the elements of a successful project, working with a commissioning service provider, and the building operator's role in a commissioning project. At the completion of this class, students will understand the range of commissioning; when, where and what type of commissioning may be appropriate for their building or project; how building operators can reduce commissioning costs through active participation in the process; establish a list of expected work products (deliverables) from a third-party commissioning service provider; and access the available resources.

Week 5: BOC 2004 Water Efficiency for Building Operators

Students will identify water savings measures in their building through detection and repair of leaks, operational changes, and low-cost equipment improvements. The class will start with an examination of water/sewer bills for savings opportunities. Other subjects will include deduct meters, leaks, faucets, showerheads, toilets, urinals, cooling towers, garbage disposals, and landscapes.

Week 6: BOC 2014 Enhanced Automation and Demand Reduction

This class introduces technologies to help building personnel better manage their energy use, reduce electrical demand, and maintain or even improve the comfort of building occupants. Topics covered include how to screen buildings to assess enhanced automation (EA) potential, lighting and HVAC technologies and control strategies, energy management and information systems, as well as EA implementation strategies. Upon completion, students will understand the complexities of enhanced automation and the role of the building operator in making EA really work in facilities.

Week 7: BOC 2005 Project Peer Exchange: Present Your Final Report

Students will make short presentations to classmates and the instructor on a scoping report for their building. The report documents building operating conditions and provides a set of recommendations for improving performance with a focus on energy efficiency. Presentations offer students the opportunity to practice communication skills and to share feedback with their peers. Following presentations, the class will wrap up with a discussion of effective strategies for presenting their reports to management and winning support for their recommendations. Students attending this class will understand how to prepare and deliver an informative and coherent presentation on their building's performance.

Prerequisites

It is highly recommended that program participants have a high school diploma or GED, and:

- A technical degree and three years of experience working in operations and maintenance of a commercial or institutional facility, OR
- a union membership at journey level and three years of experience, OR
- BOC Level I Training Certificate of Completion or Certification and four years of experience.

The following textbooks/materials are required for successful completion of this course:

- BOC Level II Project Workbook
- BOC 2001 Student Handbook
- BOC 2002 Student Handbook
- BOC 2003 Student Handbook
- BOC 2004 Student Handbook
- BOC 2005 Student Handbook
- BOC 2014 Student Handbook

Course Rationale

Trained and motivated building technicians can reduce utility costs at facilities by at least 5 to 15 percent. One of the key jobs to ensure energy efficiency in buildings is through building maintenance and operations.

This requires in-depth training from an established program that has proven success.

Instructional Strategies

This course may employ the following instructional strategies to present information:

- Lectures
- Demonstrations
- Small group exercises and “report outs”
- Q&A sessions
- Questions are always encouraged

Course Outline

The parts/modules and their learning objectives are:

BOC 2001A: Building Scoping for Operational Improvements

After this class, an operator should be able to:

- Explain requirements for completing the Level II training certificate
- Describe components of the Level II project assignment
- Summarize characteristics and benefits of a high-performance building
- Calculate an energy use intensity (EUI) for a case study building
- Analyze seasonal trends for a case study building
- Prepare for completing the Week 1 project assignment
- *Assignment 1: Assemble Utility Data for Building Scoping*

BOC 2001B: Building Scoping for Operational Improvements

After this class, an operator should be able to:

- Review and discuss answers to Day 1 test
- Report your findings from the Day 1 project assignment
- Explain the purpose of the building scoping interview guide
- Describe four common opportunities for improving building energy performance
- Practice using O&M tune-up checklists
- Prepare for a building walkthrough
- Describe the Day 2 project assignment
- *Assignment 2: Assemble Building Operation Data for Scoping*

BOC 2002: Optimizing HVAC Controls for Energy Efficiency

After this class, an operator should be able to:

- Refresh knowledge of HVAC controls fundamentals
- Describe control strategies for optimizing building performance
- Write a sequence of operation for HVAC

- Explain a procedure for testing the control system
- Identify maintenance requirements for controls
- Identify future trends in building controls
- Prepare to complete the project assignment

- *Assignment 3: HVAC Control System Sequence of Operation and Functional Test Procedure*

BOC 2003: HVAC Controls Fundamentals

After this class, an operator should be able to:

- Comprehend the range of commissioning types including new construction commissioning, retrocommissioning, recommissioning and continuous commissioning
- Identify when, where and what type of commissioning may be appropriate for their building or project and what elements make up a successful project
- Understand the role of a building operator in the commissioning process and how they can reduce cost through active participation in the process
- Establish a list of expected work products (deliverables) from a third-party commissioning service provider that enhance operating and maintaining buildings
- *Assignment 4: Building Walkthrough Plan*

BOC 2004: Water Efficiency for Building Operators

After this class, an operator should be able to:

- Develop an action plan for applying water efficiency concepts back on the job
- Discuss the rationale of using water efficiently
- Discuss how national industry standards, federal and local requirements, guidelines and programs address water efficiency
- List the phases in a facility water assessment
- Discuss case studies and resources for water efficiency technologies and best management practices
- List sources of water and water-using equipment in commercial and institutional facilities
- Describe common water efficiency opportunities for at least three types of equipment or processes
- Conduct a walkthrough audit and discuss efficiency opportunities with colleagues
- Describe strategies for facility water reclamation and reuse
- *Assignment 5: Building Scoping Report*

BOC 2014: Supplemental Course

After this class, an operator should be able to:

- Know the terminology of enhanced automation (EA)

- Recognize the enhanced automation options available
- Examine his/her facility to determine a suitable plan of action
- Be able to perform a cost benefits analysis of EA options to gain approval for action
- Be able to implement an appropriate EA system at his/her facility

BOC 2005: Project Peer Exchange: Present your Final Report

After this class, an operator should be able to:

- Describe the elements of an effective presentation
- Present one or more elements of a building scoping report to classmates
- Participate as a peer member during report presentations
- Set a goal for delivering a scoping report to management back on the job

Course Structure

Series duration is 7 weeks of live, instructor-led online class. Individual classes will occur twice a week, and each class lasts approximately three hours.

Grading System and Procedures

A training certificate of completion will be issued to learners that complete an application, meet the attendance requirements, and receive a score of 70% or higher on each of the open-book exams. Students are permitted to miss no more than one week of class. Participation in class discussions and group exercises is highly encouraged.

Need for accommodations

If a student has need for specific accommodations to complete the course, please contact our training center at 570-327-4768 or cleanenergy@pct.edu.

Course Policies and Procedures

Location:

TBD based on client preference

Clean Energy Center Office Hours:

8 a.m. to 4:30 p.m. daily

Phone: 570-327-4768

E-mail: cleanenergy@pct.edu