

## OPERATIONS AND MAINTENANCE ESSENTIALS COURSE OUTLINE

### Chapter 1: What is High Performance Building?

- The definitions of sustainability and high performance building.
- The value proposition for green buildings and the potential for green jobs.

### Chapter 2: Connection Between Buildings & Climate

- The connection between building energy and climate change.
- The effects of climate change and the consequences of not taking immediate action.

### Chapter 3: Working Towards Solutions

- Environmental solutions that the US and partner countries have implemented.
- The difference between mitigation and adaptation as responses to climate change.
- The definition and importance of environmental justice.

### Chapter 4: Integrated Systems are Key

- The holistic strategies required for the Whole Building Approach and Integrated Project Delivery.
- The eight strategies for high performance buildings that are the basis of the rest of the O&M course.

### Chapter 5: Operations & Maintenance in Green Buildings

- How simple practices like the 4Ms, keeping logbooks, and asking probing questions are the backbone of green building operations.

### Chapter 6: Performance Metrics

- The common metrics and tools used in measuring building performance, and the operator's role in monitoring building performance and evaluating which information is important.
- The ways building operations can impact utility costs and consumption.

### Chapter 7: The Building Envelope

- The building science concepts that explain how heat flows, how air moves in buildings and simple ways to prevent heat loss/gain through the envelope.
- How to identify and manage moisture to prevent mold and indoor air quality issues.
- No- and low-cost opportunities to save energy and improve comfort by reducing movement of air and heat and fixing common sources of air and moisture leakage.

### Chapter 8: Water Use

- Sources of water leakage and straightforward conservation solutions.
- The largest end uses of water in Residential and Commercial buildings, and how to implement common improvements to conserve water.

### Chapter 9: Heating, Cooling & Hot Water

- Overview of a variety of heating and cooling systems and the most common configurations of HVAC systems.
- How to incorporate best practices into schedules and checklists for daily rounds and regular maintenance.
- Common areas of inefficient operation, tips for troubleshooting and repair, and strategies to optimize the performance of building systems.

## Chapter 10: IAQ

- How to measure IAQ and recognize the common causes of poor IAQ.
- The relationship between good IAQ and improved occupant health and performance.
- How to implement IAQ best practices.

## Chapter 11: Lighting

- Key terminology used in the lighting industry, including key performance outputs of lighting.
- How to select appropriate lamps and controls for common applications and take advantage of enormous advances in lighting.
- How to develop an implementation plan for energy-saving lighting strategies and calculate the cost effectiveness of a simple lighting retrofit.

## Chapter 12: Waste Reduction

- The most common waste streams found in buildings and which ones have financial value.
- How to conduct a building waste audit and use the results to reduce waste.

## Chapter 13: Resilience

- The environmental threats that buildings may face due to climate change.
- Steps to lessen the impact of catastrophes like heavy storms, flooding, and blackouts.

## Chapter 14: Commissioning Existing Buildings

- The differences and similarities between an energy audit and existing building commissioning, as well as the Operator's role in each.
- The financial paybacks of energy conservation measures included in an energy audit and their operational implications.

## Chapter 15: Action Plan

- Opportunity for students to finish assembling a comprehensive list of action items.
- How to prioritize and select three action items to accomplish immediately.
- How to convince others of the benefits of implementing these action items.

