



## Building Operator Certification and Building Re-Tuning Training

### Preparing for the Day-to-Day Maintenance of Energy Efficient Systems

Building operators, who manage the day-to-day operations of commercial and multifamily residential buildings, ensuring proper operation of heating, ventilation, and air conditioning (HVAC), lighting, and other building systems, are well situated to promote energy efficient operation of these buildings. A capable workforce of building operators literate in energy efficiency concepts can identify and help to implement low- or even no-cost energy saving strategies. These solutions may involve data collection on existing building system performance as well as subsequent adjustments to these systems to ensure optimal operation at designed levels. Further, knowledgeable operators, because they are routinely engaged with building system performance, are uniquely well-positioned to advise owners about current building system inefficiencies, which when addressed and resolved through energy retrofits can yield high returns on investment.



Images from [video](#) documenting the EEB Hub's first Building Operators Certification program

**Source:** Penn IUR

Building management firms who employ building operators cite a lack of trained building operators as one of their main concerns about meeting building energy efficiency goals [1]. To fill this gap in the labor market, the [National Institute of Standards and Technology Manufacturing Extension Partnership](#) (NIST MEP) awarded \$455,000 to the [Delaware Valley Industrial Resource Center](#) (DVIRC) in consort with the Energy Efficient Buildings Hub (EEB Hub) and several of its partners to train building operators in the commercial, industrial, educational and municipal government sectors to more efficiently and economically operate their facilities. The NIST pilot program, which will take



place over two years, involves Building Re-Tuning Training (BRT). Combined with the Hub's efforts to bring the [Building Operator Certification](#) (BOC) to the Greater Philadelphia region, the main concern of Commercial Building Management firms is being strategically addressed. Until now, neither Building Operator Certification nor Re-Tuning training were offered in the Philadelphia region. The EEB Hub expects that the building professionals and incumbent energy employees who participate in these trainings will disseminate the knowledge and skills they acquire throughout their home-based buildings and local organizations, thereby amplifying the energy saving effects of such building science training throughout the Greater Philadelphia region.

## Building Operator Certification

BOC is a national training and certification program aimed at individuals working in commercial and educational buildings. The certification program includes two levels of training: (1) building systems maintenance; and (2) equipment troubleshooting. Level one targets professional with two or more years of experience in operation and maintenance of commercial facilities and provides a foundational understanding of how buildings use energy and energy accounting practices. Level two training focuses on preventative measures, electrical system diagnostics, HVAC troubleshooting, and control and optimization of building automation systems. The BOC level two target audience includes professionals with a technical college degree and three or more years of work experience, or a BOC level one certification and at least four years work experience. According to consultants evaluating BOC courses, graduates save their organizations between \$12,000 and \$20,000 annually through measures they implement following the training – measures such as optimizing operations, adjusting building system controls, tracking energy consumption, and presenting energy-saving opportunities to their supervisors [2]. Building Re-Tuning Training targets a more diverse audience with varying levels of technical ability to prepare them to monitor, detect, and recommend improvements in observed trends of building automation systems. The EEB Hub is promoting this training in order to develop the local workforce, provide career certifications that can simultaneously upgrade professional skill sets while helping individuals function more effectively at their jobs, provide more value to their employers and be more marketable in their energy efficiency career pursuits. The EEB Hub anticipates the potential financial benefits of the program will incentivize employers to encourage their facility operators to enroll in these training opportunities.



## Building Re-Tuning

BOC, with its focus on the fundamentals of building energy systems, is often considered a prerequisite to enrolling in the BRT training program. The BRT program focuses heavily on automated HVAC and building systems, whereas the BOC trainings tackle the energy literacy needed to understand all building systems and how they interact and function. The BRT was initially developed for large-scale commercial buildings (>100,000 square feet) with full building automation systems. During BRT training, participants are exposed to scenario-based learning situations.

Building re-tuning is a systematic process to identify and correct building operational problems with existing building automation systems that lead to energy waste, such as faulty sensors, insufficient insulation, and door and window leaks. A building re-tuning can often be performed at little or no cost other than the labor required for performing the process.

The initial iteration of the BRT training, developed by the [Pacific Northwest National Lab](#) (PNNL), targeted large commercial facilities and was heavily data-driven to select specific building energy usage trend data to identify operational inefficiencies, abnormalities, or other system integration problems [3]. Large-scale building BRT gives performance-based recommendations for addressing inefficiencies made possible only with the data available from building automation systems. The NIST pilot program is being undertaken to augment and translate BRT analysis for small-and medium-size buildings. Unlike larger buildings, these smaller-scale buildings generally cannot rely on data for recommended operational performance, because they typically don't have building automation systems installed that would make data collection possible. Frequently, smaller buildings operate with less complicated equipment, consisting generally of packaged units for heating and cooling with simple air distribution controlled by thermostats. The recommendations for small to medium commercial spaces can be prescriptive in nature or involve specific data collection through sub-metering to identify and address common equipment inefficiencies.

BOC and BRT trainees can address the need for operational improvement of commercial and institutional buildings of various sizes, which ties directly to the EEB Hub's goal to reduce commercial building energy consumption by 20% by 2020. As these programs become available throughout the region and penetrate the market, they will help to fill the critical objective of growing an energy savvy workforce with the skills to understand and ensure energy efficient building operation.



## References

- [1] Energy Efficient Buildings Hub (2012). Platforms Kickoff Summary Report, from [http://www.eebhub.org/media/files/Platforms\\_Kickoff\\_Summary\\_distribute.pdf](http://www.eebhub.org/media/files/Platforms_Kickoff_Summary_distribute.pdf).
- [2] Putnam, C. (2012). Building Operator Certification: Energy Efficiency through Operator Training [webcast], from <http://www.theboc.info/info-webcast-recording/BOC-Info-Meeting-Talk-7-2012-Nat-Webcast.pdf>.
- [3] Pacific Northwest National Laboratory. (2012). Commercial Building Re-tuning Training, from <http://www.pnl.gov/buildingretuning/training.stm>.