

Building Operator Certification: A Regional Market Transformation Venture Grows Nationally

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ABSTRACT

Building Operator Certification (BOC) was developed as a market transformation venture with funding from the Northwest Energy Efficiency Alliance (Alliance). In 2000, the program was spun off from the Alliance to operate as a self-supporting business venture under the administration of the Northwest Energy Efficiency Council (NEEC). NEEC's business plan entailed growing the program nationally to serve regions beyond the Northwest. BOC was packaged as a turnkey program and licensed to interested organizations. Today, five organizations hold licenses and are offering BOC to customers across thirteen states. This paper describes market response to the BOC program in the Northwest and how partner organizations in other regions are adapting BOC to serve their customers. It discusses the common issues partners face adapting the program to their markets, and the lessons NEEC has learned in working with partners to expand the program nationally.

Introduction

Building Operator Certification (BOC) is a competency-based training and certification for building operators designed to improve the energy efficiency of commercial buildings. Operators earn certification by attending training sessions and completing project assignments in their facilities. The certification provides a credential for professional development while also offering employers a way to identify skilled operators.

BOC began life as a utility-funded training program with no certification component. It was led by state agencies in the Northwest – the Idaho Department of Water Resources and the Washington State Energy Office – and launched in 1988 with a series of single classes focused on improving the operation and maintenance of HVAC and lighting systems in commercial buildings. Participation was strong with an annual attendance of 800 operators. Demand for classes spurred interest in developing the “training only” program into a full-fledged professional certification for building operators.

Professional certification is an established practice in many professions, but for building operators it was new and needed testing in the marketplace. In 1997, the Northwest Energy Efficiency Alliance (Alliance) set out to do that by providing funding to develop

Building Operator Certification and bring it to market in the Northwest states of Idaho, Montana, Oregon and Washington.¹

For the next four years, BOC grew regionally to register 1,000 operators in training course series. By 2000, over 700 operators had been certified and awareness of BOC had grown to 35 percent among employers of building operators in the Northwest (Peters 2001). Also in 2000, Alliance funding for BOC came to an end in Washington and Oregon. The program spun off from the Alliance and began to operate independently through NEEC.

Market Transformation Goals for BOC

NEEC established three goals for the BOC venture in the marketplace. These included: 1) making the program a financially self-supporting enterprise in three years, 2) achieving market transformation impacts in the Northwest in five to seven years, and 3) expanding the program to other regions beyond the Northwest. Each is discussed below.

Financially Self-Supporting in Three Years

BOC's progress towards the first goal of financial viability was reported by the authors in a 2000 ACEEE Summer Study paper (Putnam, et al. 2000). That paper discussed the creation of a business plan which provided a legal and organizational structure within NEEC for operating BOC that would enable it to execute an exit strategy within three years of implementation. The plan outlined a marketing strategy and a financial program for accurately tracking expenses and phasing in tuition pricing to reach a breakeven point. Third party evaluation of the NEEC BOC conducted by Research Into Action, Inc. under contract to the Alliance contributed to NEEC's tuition pricing decisions by providing information on willingness to pay gathered from interviews with employers. A baseline survey of the 4-state region (Peters, et al. 1999b) found that more than one-fifth of supervisors were willing to pay \$950 per course series which was NEEC's "break even" price. NEEC increased tuition pricing from \$550 per course series in 1997 to \$850 in 1999. By 2000, the first year of operation without Alliance funding, the price rose to \$950 allowing BOC to operate as a self-supporting venture. Satisfaction with BOC and strong marketing of BOC's benefits enabled NEEC to raise prices and continue to fill seats in course series.

Market Transformation Impacts in Five to Seven Years

Achieving market transformation impacts in five to seven years was the second goal for NEEC's BOC venture. NEEC identified two measures for evaluating progress towards market transformation: formal accreditation of BOC by licensing and education institutions, and recognition of BOC in the professional development programs of major employers and facility associations. Accreditation means to offer continuing education hours for BOC classes. Recognition means that the organization has publicly attributed value to BOC as a professional development opportunity for its employees or members. For example, BOC is

¹ The Alliance provided funding to the Northwest Energy Efficiency Council (NEEC), a business association of the energy efficiency industry, to develop and implement BOC in Washington and Oregon, and to the Northwest Building Operators Association, an operators membership association, to implement in Idaho and Montana.

identified as a component of a comprehensive professional development plan for employees of Washington State General Administration (Washington State, 1998). Six organizations have accredited BOC and eight have recognized it as a professional development program for their members as shown below (Peters, et al, 2001):

BOC Recognition

- Washington State General Administration
- Washington Association of Maintenance and Operations Administrators
- Washington State Society of Health Care Engineers
- International Union of Operating Engineers (Washington)
- U.S. Navy, Naval Station Everett, Everett, WA
- Tri-Met Transit, Portland, OR
- Oregon Air National Guard
- National Association of Power Engineers

BOC Accreditation

- Washington Department of Labor & Industries
- Oregon Department of Consumer and Business Services, Building Codes Division
- Lower Columbia Community College (Washington)
- Lane Community College and Rogue Community College (Oregon)
- Oregon State Board of Examiners for Engineers and Land Surveyors (OSBEELS)
- International Facility Management Association (IFMA)

Third party evaluation by the Alliance looked at additional indicators of market transformation effects of BOC. These included employer regard for the BOC credential; employer plans to send staff to BOC; student plans to include BOC on resumes; student increases in job responsibility and compensation; and student engagement in energy efficiency practices at their facility.

- Look for BOC Credential: Eighty-two percent of supervisors report they will look for BOC on resumes in the future. (Peters, et al. 2001)
- Send Staff to BOC: Forty six percent of all supervisors and 60% of all BOC-aware supervisors indicate they are considering sending staff to the BOC in the next year. (Peters, et al. 2001)
- Put BOC on Resume: Most students (96%) plan to put BOC on their resume when they have one. (Peters, et al. 2000)
- Increase in Compensation: For BOC students who had increases in compensation or increased responsibilities after the BOC, close to 50% attribute these changes to the BOC. (Peters, et al. 2000)
- Energy Efficiency Practices: BOC trained building operators are more likely than untrained operators to engage in efficient building operation and preventive maintenance activities. They are also more likely to read energy meters and bills monthly, and to provide supervisors with an idea for energy savings opportunities at least three to four times a year. (Peters, et al. 2001)

Expansion to Regions Beyond Northwest

In 1999, the final year of Alliance funding, NEEC pursued a business strategy to grow BOC nationally. The strategy involved licensing BOC as a turnkey program for other organizations to implement in their service areas. A standard license agreement was developed to grant partners (license holders) the use of the BOC trademark and program materials. Accompanying the agreement was a turnkey package of curriculum, marketing, and administrative materials to enable licensees, with initial training from NEEC, to implement a high-quality BOC program in their service areas. The license agreement and turnkey package formed the building blocks for expanding the program nationally. With these in place, NEEC was now able to respond to interest from prospective partners.

The Northeast Energy Efficiency Partnerships, Inc. (NEEP)² was the first organization to enter into a license agreement for BOC. The following year, the Northwest Energy Education Institute (NEEI), the Energy Center of Wisconsin (ECW) and San Diego Gas & Electric (SDG&E) signed license agreements and began offering BOC in their service areas. In the same year, the Sacramento Municipal Utility District (SMUD) offered a pilot BOC course series with assistance from NEEC. In early 2002, the Midwest Energy Efficiency Alliance signed an agreement to offer BOC in Ohio, Minnesota and Illinois.

Table 1 shows BOC partners and their territory. By early 2002, BOC was serving 1,748 building operators in fourteen states.

Table 1. BOC's National Reach: Partner Organizations and Service Areas

Program Inception	BOC Partner	Service Area
Northeast Energy Efficiency Partnerships	2000	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont
Northwest Energy Education Institute	2000	Oregon
Sacramento Municipal Utility District ³	2001	Sacramento, CA
Energy Center of Wisconsin	2001	Wisconsin
San Diego Gas & Electric	2001	San Diego County
Midwest Energy Efficiency Alliance	2002	Illinois, Minnesota, Ohio

² NEEP is a non-profit entity based in Lexington, MA supporting regional energy efficiency initiatives.

³ Currently in pilot phase.

Adapting BOC to Local Markets

Implementation of BOC in new markets involves a series of prescribed steps to adapt the program to local markets. This section describes the steps and discusses common adaptation issues experienced by BOC partners. Four partners are reporting data: Northeast Energy Efficiency Partnerships, Inc., Sacramento Municipal Utility District, Energy Center of Wisconsin, and San Diego Gas & Electric.⁴ NEEP and SMUD have one or more years experience operating BOC while ECW and SDG&E are in their first year. The general population of their service areas ranges in size from one million (SMUD) to 20 million (NEEP). Each has large commercial centers which serve as the focus of their implementation efforts.

Key Implementation Activities

NEEC provides an implementation training session for BOC partners at the outset of program implementation. Thereafter, NEEC is responsible for maintaining and updating the curriculum, reviewing and approving instructors, and marketing BOC at the national level. Partners carry full responsibility for implementation in their service areas. This includes seven key steps: Establishing an organizational structure; Setting targets; Building an instructor pool; Modifying curriculum; Developing a marketing plan; Delivering training and administering certification; and Evaluation. These activities form the basis for successful operation of the program. They are summarized with descriptions in Table 2.

Market Response to BOC in Partner Territories

BOC partners have been successful in meeting their implementation targets for BOC, and in some cases, targets have been exceeded. NEEP and ECW doubled and tripled their first year targets for course series, respectively. All course series that were scheduled and promoted by partners were subscribed by a sufficient number of registrants, generally 18 or more per series. None had to be cancelled due to lack of registration. Registrants also represent a broad range of facility sectors including education, manufacturing, health, hospitality, government, utility, and property management. One exception to this sector diversity was SDG&E, which formed a strategic alliance with the City of San Diego Energy Management Office to offer the BOC program to a group of senior building operators working in city facilities. This alliance enabled the city to evaluate the merits of the program and SDG&E to fill seats and accelerate awareness and value with a significant market sector. Success with this sector will be used to expand the service to other sectors in the future.

⁴ Note that data on NEEI's program in Oregon is excluded. NEEI served as a contractor to NEEC to implement BOC training in Oregon prior to acquiring a license to operate the program as a full partner. While the program is achieving success in the Oregon market (Peters, 2001), their implementation history as a contractor prior to establishment of the turnkey program makes their experience unique.

Table 2. BOC Implementation Activities

Implementation Activity	Description
Establish Organizational Structure	Define organizational structure for implementation including responsibilities for management, registration and certification, marketing, instruction, site coordination, and evaluation.
Setting Implementation Targets	Determine the number of course series to be offered annually; number of registrants to recruit; number of operators certified; accrediting institutions; and recognition by employers and associations.
Build Instructor Pool	Recruit high quality, experienced local instructors to teach BOC curriculum in seven topic areas. Building systems overview, energy conservation, HVAC systems and controls, efficient lighting, codes, electrical systems, and indoor air quality. Feed and maintain pool over time.
Modify “Codes” Curriculum	Modify BOC class titled “Maintenance & Related Codes” to reflect state and local building maintenance codes.
Develop Marketing Plan	Adapt turnkey BOC marketing plan to local market. Phase I: Recruit sponsors and fill seats in classes. Phase II: Build awareness and value among employers, and earn accreditation.
Deliver Training & Administer Certification	Set annual schedules and coordinate on-site with facility host, instructors, students, and sponsors. Set price for tuition. Issue certifications, manage renewal process, maintain list of certified operators.
Evaluation	Develop evaluation plan for customer feedback.

Table 3 summarizes BOC partner targets for program activity and the actual market response. Territory size and program inception dates account for differences between partner accomplishments. Larger territories such as New England, and older programs such as NEEC’s in the Northwest, have higher numbers in most categories than younger programs or those in smaller territories.

Table 3. Projected v. Actual Targets for BOC Activity

Activity	NEEC	NEEP	ECW	SDG&E	SMUD	TOTAL (Actual)
Year of Inception	1997	2000	2001	2001	2001	1997-present
Territory Size (population millions)	8	20	5	3	1	40 million
Course Series (projected/actual)	45/48	10/20	1/3	1/1	1/1	73 course series (126% of target)
Registrants (projected/actual)	1000/ 1200	225/463	25/40	25/25	30/20	1,748 registrants (134% of target)
Certified Operators ⁵ (projected/actual)	450/470	158/258	18/NA	20/18	27/18	764 certified (115% of target)
Recognition by Employers & Associations	5/7	1/1	NA	1/1	1/1	10 facility assns
Accrediting Institutions	3/5	NA	NA	NA	NA	5 institutions

Common Adaptation Issues

BOC partners face adaptation issues in each of the implementation areas discussed above and summarized in Table 2. Of the seven areas, partners have adaptation issues in common in three: building an instructor pool, developing the market plan, and delivering training. These issues are discussed below.

Building an Instructor Pool

Finding qualified instructors is particularly difficult in regions without a history of providing training to a non-academic, building operator audience (e.g., Sacramento and San Diego). Topic expertise is available within the consulting engineering community, but not all consultants and engineers have the teaching skills to deliver an effective, full-day classroom session. Partners are finding it takes six to twelve months to build a solid instructor pool for BOC. Once built, the pool needs to be replenished annually due to attrition. Instructor recruitment and retention requires ongoing effort by partners.

⁵ About 70% of registered operators earn certification. Registration figures reflect all past and currently registered students working towards certification.

Developing the Marketing Plan

Marketing the value of BOC is a challenge common to all partners. Partners have been very successful in the first phase of marketing BOC, which involves filling seats in classes. No course series has been cancelled due to low enrollment. Moving beyond the first phase of marketing to build brand equity and value of BOC among employers has been more challenging. Second phase activities involve a bigger, longer term commitment to building recognition of BOC. Partners must work with new, often unfamiliar organizations such as facility associations and accrediting institutions, licensing agencies, and technical colleges. NEEP, in its third year of operation, is turning its attention to second phase marketing activities. Early on in the program, they pursued accreditation of BOC with local colleges and licensing agencies but found the process too costly. They have also introduced BOC to local chapters of influential organizations such as the International Union of Operating Engineers (IUOE) with limited success. This year, they committed in-house staff to market BOC to facility associations. They plan to make presentations on BOC at chapter meetings, attend chapter conferences and trade shows, and write articles for association newsletters. SMUD and ECW have also made early strides with facility associations. The local IUOE chapter in Sacramento has offered assistance marketing BOC to its members. In Wisconsin, the local chapter of the National Association of Power Engineers (NAPE) has approached ECW and NEEC with a plan to promote BOC to members locally and nationally.

Delivering Training

A final issue in common is pricing of tuition for BOC course series. BOC is designed to operate as a cost recovery program where student tuitions support the cost of delivering training and issuing certificates. Pricing tuition to achieve some, if not full, cost recovery is a goal shared by all partners. In markets such as New England and Wisconsin, years of subsidized training by utilities and state energy offices conditioned operators to expect below-market prices for classes. NEEP and ECW are working to re-condition their markets for BOC by setting low initial prices, then phasing in price increases over time. For example, NEEP has increased tuition from \$1,200 to \$1,400 in two years. ECW started at \$845 and is increasing to a price above \$900 in the coming year. SMUD and SDG&E are working to re-condition their markets in California. SMUD received feedback from students that their price of \$1,200/course series was too high for the market. SDG&E offered its first course series at no cost to the City of San Diego.⁶

Another issue these two face is one of consistent pricing for a program offered in different territories within the same state. They are working to coordinate pricing for their next round of course series. The common adaptation issues are summarized in Table 4.

⁶ SDG&E offered a test pilot of BOC as an alternative to an operator training program they had offered in 1998 and 1999 through the University of California San Diego. While well developed and effectively presented, the UC program involved a three-semester commitment to training which was prohibitive for many operators.

Table 4. Common Adaptation Issues for BOC Partners

Implementation Activity	Common Adaptation Issues
Build Instructor Pool	Most partners spend 6-12 months building a solid instructor pool. Topic expertise is available for BOC curriculum, but high quality, experienced instructors are difficult to find.
Develop Marketing Plan	Phase II marketing (build BOC awareness and value) is challenging for all partners despite overall good success with Phase I (filling seats and securing sponsors). Phase II activities involve working with new, often unfamiliar organizations such as facility associations and accrediting institutions. It also requires a commitment of time, resources, and marketing expertise.
Schedule & Deliver Training	Pricing BOC tuition to achieve cost recovery is a goal shared by all partners. NEEP, ECW, SMUD & SDG&E are working to re-condition their markets away from subsidies to prices that are market-based. SMUD and SDG&E are also seeking price consistency within their state.

Lessons Learned

Marketing the value of BOC remains a challenge for new partners. In the early stages of program implementation, new partners lack local, tangible results to share with prospective student and employers to make the case for BOC. While new partners are working to get their own positive results, they should draw on data from NEEC’s experience in the Northwest with students, employers, and energy savings. This is well documented in third party evaluation reports by the Alliance⁷. This data (described earlier in this paper) demonstrates positive regard by employers for the BOC credential; employer plans to send staff to BOC; student plans to include BOC on resumes; student increases in job responsibility and compensation; and student engagement in energy efficiency practices at their facility.

NEEC can also play an effective role at the national level by stepping up marketing efforts with national facility associations and large employers with facilities across the country.

New partners should also integrate program evaluation components into their BOC implementation plans. Evaluation will help them understand how the market is responding to their efforts and identify modifications they can make to improve program delivery. The Alliance’s market progress reports offer a model for how this data can be gathered. Data collection forms developed by the Alliance’s evaluation team can be adopted by partners to conduct ongoing assessments.

NEEC’s implementation training for partners should be modified to cover these challenges and solutions for addressing them.

⁷ The Northwest Energy Efficiency Alliance published seven market progress evaluation reports on the BOC program from 1997 through 2001. The reports were prepared by Research Into Action, Inc. Several are listed under “References” at the end of this paper.

Building and maintaining a solid instructor pool is a part of daily life for BOC implementation. Partner experiences demonstrate that local expertise is available, but finding the talent takes time. NEEC is devoting more time in its partner training to offer guidance for instructor recruitment. It also makes its own instructors available to partners to instruct first rounds of BOC classes and to assist with train-the-trainer sessions in partner territories. As the program grows nationally, NEEC and partners should explore opportunities for sharing instructors between regions in proximity such as California and the Northwest states and Wisconsin and the Midwest states.

Pricing tuition to achieve cost recovery for BOC also poses a challenge for partners. NEEC's experience in the Northwest shows that employers are willing to pay tuition prices that allow NEEC to recover the cost of delivering BOC training. BOC's ability to operate as self supporting venture enhances the likelihood of its sustainability in the marketplace to the extent that it can weather ups and downs in energy efficiency fund sources. NEEC should screen prospective partners to ensure their business objectives for BOC are compatible with the goal of achieving cost recovery. NEEC might also offer partners support preparing a business plan that defines a roadmap for achieving cost recovery. Finally, NEEC might also explore opportunities to encourage defined pricing plans for cost recovery through its license agreements with partners.

Summary

BOC has grown in five years from serving a territory of 9 million in the Northwest to serving 40 million in regions across the country. Since 1997, 1,748 operators have registered for BOC course series and 764 have been certified. Market response to BOC in the Northwest, as documented through third party evaluation, shows that employers are willing to pay tuition prices that enable BOC to operate as a self-supporting business venture. The evaluation also points to market transformation effects in the form of employer and student regard for the BOC credential, and student engagement of energy efficiency behaviors following training and certification. BOC is recognized by major employers and facility associations, and accredited by licensing agencies and colleges in Northwest.

BOC partner organizations are adapting BOC to their regions with the expectation of similar market effects. They face common challenges building qualified instructor pools, raising awareness of the value of BOC, and pricing tuitions to achieve cost recovery goals. As they work to address these issues, NEEC is identifying ways it can better prepare partners in implementation training for the challenges ahead. As it grows BOC nationally, NEEC will focus on national marketing initiatives to build BOC awareness while also playing a key role in helping partners achieve their regional market transformation goals.

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