

Market Progress Evaluation Report
Building Operator Certification, No. 6

prepared by
Research Into Action
report #E01-077
March 2001



NORTHWEST ENERGY EFFICIENCY ALLIANCE
www.nwalliance.org

529 SW Third Avenue, Suite 600
Portland, Oregon 97204
telephone: 503.827.8416 • 800.411.0834
fax: 503.827.8437

MARKET PROGRESS EVALUATION REPORT: REGIONAL BUILDING OPERATOR CERTIFICATION

Funded By:



NORTHWEST ENERGY EFFICIENCY ALLIANCE
www.nwalliance.org

Submitted To:

Jane Gordon, Ph.D.

Northwest Energy Efficiency Alliance

Prepared By:

Jane S. Peters, Ph.D.
Marjorie R. McRae, Ph.D.
A.G. Flynn



research/into/action^{inc}

March 2001

ACKNOWLEDGEMENTS

We would like to thank Cynthia Putnam and John Doyle of the Northwest Energy Efficiency Council and Connie Searles of the Northwest Building Operators Association for their support in doing this project. We also wish to thank the BOC instructors for their time and thoughtful responses during our interviews.

In addition, our thanks go to the building operators and their supervisors who responded to our questions about the BOC courses. These men and women are seldom recognized for the significant contribution they make to the daily comfort and safe working environment of workers throughout the region. We found them consistently generous with their time and thoughtful about the issues of building operations and maintenance.

Finally, we would like to thank Jane Gordon and Andy Ekman of the Alliance. They have provided a working environment that assured the evaluation was both timely and thorough.



Acknowledgements

TABLE OF CONTENTS

EXECUTIVE SUMMARY	I
A BRIEF HISTORY OF THE BUILDING OPERATOR CERTIFICATION (BOC) VENTURE.....	I
EVALUATION OVERVIEW	II
PURPOSE OF THIS REPORT.....	III
PROGRAM STATUS AND KEY EVALUATION FINDINGS	III
Program Goals and Achievements.....	IV
Regionalization.....	VI
Transfer of NEEC Curriculum to Other Education Providers	VI
Implications for Long-Term Viability.....	VII
RECOMMENDATIONS	VIII
1. INTRODUCTION.....	1
PROGRAM OVERVIEW	1
NEEC BOC	2
IBOA/NWBOA BOC.....	4
EVALUATION APPROACH.....	6
Objectives	6
Previous Reports	7
Interview Guide Development	7
Sample Framework and Data Collection Approach	7
KEY FINDINGS AND RECOMMENDATIONS FROM PREVIOUS MARKET PROGRESS EVALUATION REPORTS.....	8
Key Findings and Recommendations from the Washington State MPER #1.....	8
Key Findings and Recommendations from the Washington State MPER #2.....	10
Key Findings and Recommendations from MPER #1 (Region-Wide Program).....	11
Key Findings and Recommendations from MPER #2 (Region-Wide Program).....	13
Key Findings and Recommendations from MPER #3 (Region-Wide Program).....	15
ORGANIZATION OF THE REPORT	17

Table of Contents

2. 1999-2000 PROGRAM STATUS.....	19
NEEC BOC	19
Objectives	19
Implementation.....	20
Teaching Process.....	21
Transfer of the Curriculum	22
Database	23
NWBOA BOC	23
Objectives	23
Implementation.....	24
Regional Coordination	24
Curriculum Efforts.....	25
Program Delivery Methods	26
Continuing Education and Promotion of the BOC	26
Database	28
3. NEEC LEVEL 2 COURSE SERIES.....	29
NEEC LEVEL 2 STUDENTS.....	29
Program Benefits	29
Student Satisfaction	31
Future Interest in the NEEC BOC Program	33
NEEC LEVEL 2 EMPLOYERS	35
Program Benefits	35
Employer Satisfaction.....	37
Future Interest in the NEEC BOC Program	38
4. NWBOA LEVEL 1 COURSE SERIES	41
NWBOA LEVEL 1 STUDENTS.....	43
Program Benefits	43
Student Satisfaction	47
Future Interest in the NWBOA BOC Program.....	49
NWBOA LEVEL 1 EMPLOYERS.....	52
Program Benefits	52
Employer Satisfaction.....	54
Future Interest in the NWBOA BOC Program.....	55

5. NWBOA LEVEL 2 COURSE SERIES	59
NWBOA LEVEL 2 STUDENTS.....	60
Program Benefits	60
Student Satisfaction	62
Future Interest in the NWBOA BOC Program.....	63
NWBOA LEVEL 2 EMPLOYERS.....	65
Program Benefits	65
Employer Satisfaction.....	66
Future Interest in the NWBOA BOC Program.....	66
6. INSTRUCTOR AND STAFF PERSPECTIVES.....	69
NEEC	69
Evolving the Level 2 Training.....	69
Ensuring Continued Market Success	72
Licensing the Curriculum Outside of the Region	74
NWBOA	76
Revising the Curriculum	76
Conducting Cost-Effective Training of a Rural Population	77
Selling to the Target Market.....	78
7. CONCLUSIONS AND RECOMMENDATIONS.....	81
CONCLUSIONS.....	81
NEEC BOC.....	81
NWBOA BOC	82
RECOMMENDATIONS	84

Table of Contents

APPENDIX A: SURVEY INSTRUMENTS

NWBOA BOC PROGRAM STAFF 2000 NWBOA INTERVIEW GUIDE.....A-1
NEEC BOC PROGRAM STAFF (LEVEL 2) 2000 INTERVIEW GUIDEA-5
NEEC & NWBOA BOC INSTRUCTORS 2000 INTERVIEW GUIDE.....A-9
NEEC LEVEL 2 BOC PROGRAM TRAINEES 2000 INTERVIEW GUIDE.....A-11
NEEC LEVEL 2 BOC TRAINEE'S EMPLOYERS 2000 INTERVIEW GUIDE.....A-19
NWBOA LEVEL 1 BOC PROGRAM TRAINEES 2000 INTERVIEW GUIDEA-25
NWBOA LEVEL 1 BOC TRAINEE'S EMPLOYERS 2000 INTERVIEW GUIDEA-33
NWBOA LEVEL 2 BOC PROGRAM TRAINEES 2000 INTERVIEW GUIDEA-39
NWBOA LEVEL 2 BOC TRAINEE'S EMPLOYERS 2000 INTERVIEW GUIDEA-47
NEEP BOC PROGRAM STAFF 2000 INTERVIEW GUIDEA-53
NWBOA BOARD OF DIRECTORS 2000 INTERVIEW GUIDE.....A-57

EXECUTIVE SUMMARY

A BRIEF HISTORY OF THE BUILDING OPERATOR CERTIFICATION (BOC) VENTURE

In 1987, the Washington State Energy Office developed the region's first course in energy maintenance practices for building operators and facility managers, called the Building Operators Training (BOT) program. The course aimed to improve the energy management skills of building operators, but did not offer certification.

Independent of the BOT, agencies in Idaho developed the region's first certification program for building operators, the Building Operators Certification (BOC) program. In 1990, the Idaho Department of Water Resources (IDWR) and the Idaho Building Operators Association (IBOA) brought a group together to begin development of a training program. IBOA began offering a course series and a one-year building operator's certification in 1993. Its successor agency—the Northwest Building Operators Association (NWBOA)—continues to offer the BOC program.

As a result of the success of the Idaho BOC, the BOT staff and steering committee recognized that certification would be a more effective long-term strategy than training alone for improving building operations. They redesigned the BOT from a single course to a multi-course BOC program leading to a three-year certification. After the closure of the Washington State Energy Office in 1996, the Washington BOC found a home with the Northwest Energy Efficiency Council (NEEC).¹

In 1996, the NEEC BOC was the first operator certification program to be funded by the Northwest Energy Efficiency Alliance (the Alliance), a non-profit group of electric utilities, state governments, public interest groups and industry representatives committed to bringing affordable, energy-efficient products and services to the marketplace. The funding supported NEEC in getting its BOC operational and established, first in Washington and then in Oregon. In 1997, the Alliance sought to promote a region-wide BOC program by continuing its funding of NEEC's efforts and by awarded funding to IBOA (now NWBOA). The Alliance assisted IBOA's BOC efforts by providing funding for marketing and evaluation research support. In addition, the Alliance funding designated IBOA as the lead

¹ The Washington State Energy Office operated from the 1970s to its closure in 1996.

agency for facilitating a region-wide approach to building operator training and certification.

EVALUATION OVERVIEW

The Alliance contracted with Research Into Action, Inc. in March 1998 to conduct an evaluation of the region-wide BOC market transformation efforts from 1998 to 2001. The staged evaluation built on results of the evaluation of the 1997 Washington BOC effort and included five key activities.

- Interviews with participating students and their supervisors for the NEEC Level 1 course series in 1998 and 1999, the NEEC Level 2 course series in 2000, and the NWBOA Level 1 and Level 2 course series in 1999 and 2000;
- Interviews with venture staff and instructors and members of the NEEC Steering Committees and NWBOA Board of Directors;
- A review of the BOC program databases and documents;
- A survey to assess operations and maintenance actions taken by NEEC BOC students as a result of course attendance and to provide estimates of energy impacts resulting from these actions;
- A baseline market assessment of the four-state region; and
- An interview with a licensed user of the NEEC BOC curriculum outside of the Pacific Northwest.

This Fourth Market Progress Evaluation Report (MPER), prepared in the fall of 2000 based on research conducted during the summer and fall of that year, follows three previous MPEs: two addressing the regional efforts of NEEC and NWBOA in 1998 and 1999, and one that provided a cumulative assessment of the programs at the end of 1999. In addition, these reports were preceded by two reports addressing the results of the 1997 Washington BOC venture.²

² See Alliance reports E97-001, E98-007, E98-007A, E98-015, E99-027, E99-031, and E99-052 <http://www.nwlliance.org/>.

PURPOSE OF THIS REPORT

This fourth MPER addresses the 1999-2000 activities of NEEC's Level 2 BOC series in Washington and NWBOA's Level 1 and Level 2 BOC series in Idaho and Montana. It also addresses the progress of efforts to make the BOC a truly region-wide program. The report includes an analysis of the student, employer/supervisor, and instructor interview responses for the targeted series. Findings from interviews with BOC staff and with members of NWBOA's Board of Directors also contribute to the analysis. NEEC has licensed its BOC curriculum to Northeast Energy Efficiency Partnership, Inc. (NEEP), located in New England; feedback from this program was also incorporated.

The scope of this fourth MPER evaluation did not include a cost-effectiveness assessment of the BOC program. The fifth and final BOC MPER will address cost-effectiveness.

The series of BOC evaluations have focused on assessing the activities supported by the Alliance during the evaluation period that met time constraints imposed by the evaluation methodology. The NEEC Level 1 courses held in Oregon in 2000 did not conclude in time to be addressed in this evaluation. While the assessment that follows investigates the activities of NEEC and NWBOA in comparable detail, the recommendations focus on NWBOA. The recommendations of previous evaluations focused on NEEC pursuant to the funding objectives of the Alliance. A summary of previous evaluation findings and recommendations follows. The Fifth MPER will provide a balanced assessment of the NEEC and NWBOA programs.

PROGRAM STATUS AND KEY EVALUATION FINDINGS

Overall, students and employers are highly satisfied with the NEEC BOC and the NWBOA BOC training programs and find them useful and relevant to their jobs. A majority of students report that they have been able to save money and increase building occupant comfort as a result of the training. A number of respondents from both series said that the course paid for itself in energy and maintenance savings, and reduced contractor calls. Most students and employers think that the series provided good value for the price.

We also spoke with BOC staff and instructors for NEEC and NWBOA. Staff and instructors identified what they considered to be strengths and weaknesses of, or challenges facing, the program. Their insights were frequently corroborated by student and employer response to the trainings.



Program Goals and Achievements

For the three years 1998 through 2000, NEEC received from the Alliance \$499,407 for its efforts in Washington and \$308,603 for its efforts in Oregon. The NEEC BOC exceeded its goals for registration and certification that it set with the Alliance for 1999 and 2000. In 1999, 260 students registered, surpassing the goal of 255, and 129 students became certified building operators, surpassing the goal of 115. It roughly met its 2000 goal, set with the Alliance for Oregon only: One hundred students registered, compared with a goal of 110, and 70 students became certified, compared with a goal of 65. These targets and NEEC’s achievements as of September 30, 2000 are given in Table ES-1.

Table ES - 1
1999 AND 2000 REGISTRATION AND CERTIFICATION TARGETS FOR THE
WASHINGTON AND OREGON BOC

STATE AND YEAR	REGISTRATION		CERTIFICATION	
	TARGET	ACHIEVED AS OF 9/30/00	TARGET	ACHIEVED AS OF 9/30/00
Oregon 1999	80	95	35	50
Oregon 2000	110	100	65	70
Washington 1999	175	165	80	79

The NEEC BOC nearly doubled its 1999 revenue goal of \$121,250, with Washington and Oregon revenues of \$236,887 (see Table ES-2). As of September 30, 2000, NEEC had available income and expense data for two of its Level 1 series: Olympia and Mt. Vernon. Together, the courses earned about \$52,000 and had expenses of \$31,000, for a net income of \$21,000, or 40% of the revenue. Both courses individually had net incomes of roughly 40% of their revenues.

Table ES - 2
1999 AND 2000 REVENUE AND TRAINING TARGETS FOR THE WASHINGTON
AND OREGON BOC

STATE AND YEAR	REVENUES		NUMBER OF TRAININGS	
	TARGET	ACHIEVED AS OF 9/30/00	TARGET	ACHIEVED AS OF 9/30/00
Oregon 1999	\$21,250	\$75,385	3	3
Oregon 2000	\$51,000	\$65,000	4	4
Washington 1999	\$100,000	\$160,502	5	7

As also shown in Table ES-2, NEEC exceeded its training targets as set with the Alliance. NEEC offered two Level 2 course series and continues to evolve the Level 2 curriculum.

From 1998-2000, NWBOA received \$375,000 from the Alliance. The Alliance funding supported program promotion and development—market research, early program evaluation, and developing new training delivery methods and continuing education opportunities. It has also received funding to promote the coordination of the NEEC and NWBOA trainings into a truly region-wide building operators certification program. NWBOA has reported completing 80% of its contract with the Alliance. It is still working on program promotion and developing delivery methods and continuing education opportunities.

NWBOA offered six Level 1 training series (five in Idaho and one in Montana) and trained 67 students, of which 65 were certified. It offered three Level 2 series (in Idaho) from 1999 through summer 2000, training and certifying 30 students. In the fall of 2000 and spring of 2001, NWBOA plans to offer four Level 1 series, including two in Montana.

NWBOA's BOC income and expense for 1998, 1999, and 2000 (to date) are given in Table ES-3. The BOC produced net income of 26%, 20%, and 61% of its revenues for the three years respectively.

Table ES - 3
NWBOA BOC REVENUES, EXPENSES, AND NET INCOME 1998 – 2000

YEAR	REVENUES	EXPENSES	NET INCOME
1998	\$21,716	\$16,166	\$5,550
1999	\$35,315	\$28,266	\$7,049
2000 (to date)	\$45,332	\$17,473	\$27,859

Regionalization

Periodically during 1998-2000, discussions were held between the NEEC and NWBOA staffs to develop a region-wide approach to BOC. As of MPER #3, the two organizations had successfully resolved curriculum differences.

A discussion facilitated by the Alliance on January 21, 2000 resulted in a Memorandum of Agreement signed by NEEC and NWBOA in February 2000. This agreement stated that the two parties would share a common bank of test questions on which determination of certification is based, include project requirements in the courses, and agree that building operators certified by one organization would be recognized as certified by the other organization. Both NEEC and NWBOA have satisfied the terms of the agreement.

Transfer of NEEC Curriculum to Other Education Providers

NEEC transfers its curriculum to other education providers through several means. First, organizations can license the curriculum. Second, organizations can *accredit* the BOC for their membership, rather than adopting the curriculum and teaching it internally. Accreditation means the organization offers credit hours or continuing education units for BOC courses. Third, organizations can *recognize* the course. Recognition means that the organization has publicly endorsed the program as a professional development opportunity for members or employees.

By September 30, 2000, six organizations had accredited the curriculum and eight organizations, up from five the previous year, had recognized the BOC as a professional development program for their members involved in facility O&M.

NEEC has successfully licensed its curriculum to an agency outside of the region. NEEP, in New England, had overwhelming success its first year offering the training. The director of the NEEP BOC emphasized the importance of utilities and other sponsors taking a lead in recruiting students for courses during the first year. Such recruitment relieves program staff of a significant task, enabling them to concentrate on getting the program up and running. It also jump-starts the program by providing a base from which word-of-mouth referrals can subsequently be generated.

The NEEC BOC project manager is continuing to market the copyrighted curriculum outside of the Pacific Northwest. Organizations in Wisconsin and California have expressed interest in the curriculum and are engaged in discussions with the BOC project manager.

Implications for Long-Term Viability

Long-term viability of the NEEC BOC program appears solid. NEEC has exceeded its goals for revenue, student registration and certification, and course offerings. Its revenues on two Washington Level 1 courses—which comprise NEEC’s most established trainings—exceeded expenses by 40%. The Level 2 series has been well received; NEEC is continuing to evolve the curriculum and expand its offering of electives.

NEEC has seen the successful transfer of the curriculum to a New England organization, whose first-year projections for course attendance were half of actual attendance. One of the instructors is adapting the curriculum for the region. NEEC is sponsoring his work and thus owns the curriculum changes. NEEC is working with organizations in other states to offer BOC training and certification.

These efforts and accomplishments, along with continued efforts to attract private sector participation in the Northwest and to keep the curriculum fresh, up-to-date and interactive, will likely ensure NEEC’s success.

NWBOA offers a BOC training that students, employers, and the instructor rates as highly as NEEC’s training is rated by its students, employers, and instructors. The long-term viability of NWBOA’s program hinges on finding a means of cost-effectively providing the training in a largely rural area. This problem is also faced by NEEC in serving students east of the Cascades. The NWBOA Board of Directors has explored the feasibility and attractiveness of offering its training on the Internet or on CDs. The Board recently concluded that the costs of such delivery approaches were too high for their market.

Past delivery of the NWBOA training via video did not garner student satisfaction. Furthermore, students in both the NWBOA and NEEC courses stressed the benefit of being able to pose questions about their specific facilities and problems and have them addressed by the instructor and the other students. Employers noted the benefit of networking that the trainings facilitate.

RECOMMENDATIONS

Recommendation 1: NWBOA should increase its ability to conduct relationship-based marketing. To this end, NWBOA should foster relationships between the BOC program, the region's utilities, and local business networks and organizations, such as chambers of commerce and other local business organizations. NWBOA should seek assistance from the Alliance's Utility Communication staff in obtaining greater utility support and promotion of the training.

NWBOA staff reported significantly less support from the region's utilities than did the NEEC or NEEP BOC staff. The latter two programs have greatly benefited from the actions of their utilities in encouraging utility customers to take the training. Alliance staff could assist NWBOA in garnering increased utility support. Opportunities may exist for the utilities to benefit from involvement with the BOC and its promotion of energy efficiency.

The marketing approach described by NWBOA's Executive Director did not appear to rely on local business networks. NWBOA should establish relationships with local groups and obtain their endorsement of the BOC. Local groups may also agree to inform their members of the BOC training schedule. Their endorsements could be used in marketing materials and in sales calls.

Recommendation 2: NWBOA should switch its attention from distance learning methods and assess whether changes to the training topics, instructional materials, and course manual might enhance course attendance.

NWBOA recently concluded its exploration of distance learning and self-study methods to reduce per-student training costs. Students interviewed for this evaluation said that the opportunity to talk over their facility and their problems with the instructor and with other students was a valuable part of the class. Both students and employers mentioned that networking with other local building operators was a major benefit from the training. It is unlikely that self-study

methods would preserve these qualities of the classroom training that students and employers value.

The instructor, many students and employers, and some Board members all recognized that additional topics would be useful to students. Building operators have a broad range of concerns, as indicated by the responses of students and employers. Employers may be reluctant to authorize training if they perceive that the focus or the topics covered do not meet enough of their needs.

Finally, word-of-mouth endorsements are the best marketing approach. Although the interviewed students were very satisfied with the training, their endorsements might be more persuasive if the usefulness of the training were visually evident to others through useful and user-friendly reference materials. Both the instructor and students considered the reference materials to be a weakness. In addition, several students and the instructor commented that the presentation of the material does not generate as much interest as it could because it is structured around large amounts of text presented on overheads.

NWBOA has a number of options it could pursue to revise its topics, instructional materials, and course manual. One alternative is for NWBOA to license NEEC's curriculum, which NEEC is willing to offer with the licensing fee waived. A second alternative is for NWBOA to seek a grant from the Alliance or other funding agency to support its development work. Third, NWBOA could support such work through its net income from the BOC program. The BOC's revenues less expenses totaled \$28,000 in 2000. Fourth, NWBOA could raise its course fees, given that 75% of employers thought the Level 1 training would still be a good value at \$700.

Recommendation 3: NWBOA should consider changes to course scheduling and marketing materials.

NWBOA should consider establishing a standard schedule for course offerings, such as trainings in April and October in Boise, June in Missoula, and so on. This schedule should be included in its marketing materials, so that interested firms will be encouraged to "jump at the chance" for local training, set training plans far in advance, or plan for staff to travel to more distant locations. The marketing materials could encourage employers to send multiple staff or to network with their colleagues at other organizations. For example, a discount could be offered to multiple employees attending from the same firm. Alternatively, the materials could state that the fee is based on an enrollment of a specified number of people; if fewer than that number enroll, attendees will have the option of paying a somewhat higher fee or waiting until the specified date when the course will be offered again.

The marketing materials should include endorsements from local utilities and business organizations, endorsements from firms whose staff have been trained, and, ideally, short “case studies” or vignettes of how the training has saved organizations money. The interviews with students and employers suggest that many think they have saved money as a result of the BOC.

Recommendation 4: NWBOA should ask students to report the number of facilities and square footage for which they are responsible. This information should be recorded in the student database.

The number of facilities and the square footage for which the student is responsible is necessary to estimate program benefits. In addition, such information is necessary to examine variations in students’ and employers’ response to the training. For example, it may be that students and employers with larger facilities or with multiple facilities attribute more value to the program. Such a finding might suggest alternative marketing approaches tailored to the characteristics of organizations facilities.

Recommendation 5: Both NEEC and NWBOA should train students in either estimating energy and non-energy benefits that flow from their activities or in simply tracking efficiency-related activities. This training could be combined with training in preparing proposals for consideration by management and tracking O&M activities for compliance with standards.

Employers, students, and the BOC program would all benefit from students learning simple ways to estimate energy and non-energy benefits or to track their efficiency-related activities. Employers would benefit from the information that estimating or tracking would yield by enabling them to improve their decisions allocating staff time and investment resources. Students would benefit from learning how to make proposals to management for funds to undertake needed system enhancements. They would also benefit from procedures, checklists, or activity logs that would simplify the task of documenting their performance and their facilities’ compliance with standards. Students have requested training in both proposal development and documentation of activities and students have liked portions of the training that offered them checklists for organizing and prioritizing their activities. The BOC program would benefit from the information generated because prospective employers could obtain a concrete sense of the benefits the training offers their organization.

Once such training is offered, students could receive CEU credits by reporting the results of their estimation or tracking activities and proposing next steps for themselves. Alternatively, a Level 1 course could offer students a tracking method, including ready-to-use lists, forms or software, and a CEU workshop or a Level 2 course could build on the tracking data to teach the estimation of energy and non-energy benefits. NEEC and NWBOA could submit a proposal to the Alliance to fund the development of such courses and tracking materials.

Recommendation 6: Both NEEC and NWBOA should enhance their capability for self-evaluation, so that ongoing program enhancements can be based on feedback from instructors, training coordinators, students, and employers.

After Alliance funding ends, along with Alliance-funded evaluations, both NEEC and NWBOA would benefit from expanding the feedback they solicit from students, employers, instructors, and training coordinators. Although NEEC and NWBOA currently ask students to complete an evaluation at the end of each course, they should examine the questionnaires' completeness in light of the absence of Alliance-funded evaluations. NEEC and NWBOA also should consider seeking employer feedback and formalizing the process whereby instructors and training coordinators describe any changes they would like to see in the training. Survey instruments used in the current evaluation may provide the agencies with a starting point for soliciting ongoing feedback.

Executive Summary