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REPORT #E19-387

2018 BOC Program Dataset Analysis

Prepared For NEEA:

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Memorandum

To: Amy Webb, Project Manager, MR&E, NEEA

From: Ryan Bliss, Managing Director, Zac Hathaway, Consultant 3, Research Into Action

Date: March 1, 2019

Re: 2018 BOC Program Dataset Analysis

This memo documents Research Into Action's analysis of the Northwest Energy Efficiency Council (NEEC) Building Operator Certification (BOC) program dataset as of 2018. The primary goal of this analysis was to describe the 2018 new BOC certificants and update the count of active BOC certificants in the four Northwest ("Northwest") states as of January 18, 2019.

The certificants counted in this memo include those in target groups of NEEA's BOC Expansion (BOC-E) Initiative, established in 2012 to accelerate adoption of BOC and increase its market penetration in the Northwest. Those groups are: operators in underserved areas,¹ Federal employees, and members of the International Union of Operating Engineers (IUOE). Although BOC-E targets the above specific groups, NEEA's support for BOC is not limited to those groups.

Types of Certification

Prior to 2016, NEEC awarded a certification to BOC graduates who completed certain requirements. NEEC offered two certification levels: Level I and Level II.² Starting in 2016, to align BOC with the ISO 17024 standard, NEEC established an additional and separate level of certification. Students who complete the existing BOC certification requirements receive the Training Certificate of Completion ("TCOC") designation. Those who pass an additional exam that conforms with the 17024 Standard earn the "Certified Building Operator" ("CBO") certification. In 2016, NEEC changed the designation of all previous BOC certificants to TCOC and allowed them to obtain the CBO status after completing the additional requirements.

The distinction between TCOC and CBO is not important for calculating energy savings from NEEA's support of BOC. Since no research has documented that savings are different for those who achieve the CBO status, NEEA counts both types of certificants equally in savings calculations. Therefore, this memo treats them as equal for counting the number of certificants and refers to them collectively as "BOC" certification.

¹ "Underserved markets or communities" are defined as markets that BOC serves on an infrequent basis (i.e. once every three to seven years), and generally only with the active engagement of a utility sponsor or larger employer.

² Level I classes focus on HVAC controls, common opportunities for operational improvements, and building scoping for energy efficiency, key activities associated with energy efficient building operations. Level II training is designed for individuals who have completed Level I training or who have three or more years of experience working in operations and maintenance of a commercial or institutional facility.

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Methods

This section describes how Research Into Action developed a BOC dataset to track year-by-year data on certificants, how we update that dataset annually with data from NEEC, and how we calculate annual counts of certificants from the data in the updated dataset.

Development of the NEEA BOC Dataset

From 2012 through 2014, Research Into Action used data from NEEC and the Intermountain Building Operators Association (IBOA) to develop a dataset of individuals employed in the Northwest that had received BOC certification from 1996 through 2014. That dataset resides on the NEEAnet SharePoint site – this memo refers to it as “the NEEA BOC Dataset.”

Each record in the NEEA BOC Dataset includes the same fields that are in the NEEC database, which contain information about the certificant and his/her employer as well as the years of BOC (now TCOC) certification and expiration of Level I and Level II certifications. As maintaining certification requires annual renewal, the year of “expiration of certification” is the year following the last year of renewal or the year of certification if the certificant did not renew certification.³ In addition, the NEEA BOC Dataset includes fields and worksheets that Research Into Action created to provide year-by-year counts of active certificants as well as to generate additional analyses of interest to NEEA.

Updating the NEEA BOC Dataset

NEEC continues to maintain a separate database of TCOC and CBO certificants in the Northwest.⁴ NEEC annually updates the BOC certification status, contact information, and employment information of certificants in its database. If a certificant retires from work or is deceased, NEEC indicates that information in the database fields that track employment data.

Each year, NEEC provides Research Into Action with a data file containing records of new TCOC recipients and BOC certificants for the four NEEA states as well as records of continuing certificants with updated data. Research Into Action uses that data file each year to update the NEEA BOC Dataset. At the time of the previous update, done in January 2018, the NEEA BOC Dataset contained 3,111 records.

On January 18, 2019, NEEC provided Research Into Action with a data file through the end of 2018 containing 3,259 records of individuals who received their TCOC or CBO certificate and are employed in the Northwest. The 2018 NEEC data file contained a total of 65 records for individuals who passed the additional exam to earn their CBO certification. NEEC reclassified all remaining individuals as TCOC certificants. As noted above, however, for tracking and claiming energy savings for NEEA, the distinction between TCOC and CBO does not matter.

³ Certificants that do not renew certification in a given year may renew in a later year if they complete all the continuing education requirements for the missed years. BOC considers those individuals to have maintained certification continuously. However, if in a given year a certificant did not renew in the previous year, BOC considers the certification to have expired in the previous year.

⁴ Prior to 2014, NEEC maintained a database of Washington and Oregon BOC certificants, while IBOA maintained a separate database of Idaho and Montana BOC Certificants. In 2014, NEEC integrated the IBOA certificant data into its database and since then has maintained a database of certificants in all four states.

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Research into Action reviewed the 2018 NEEC BOC data file to identify: 1) new certificants (i.e., individuals not already identified in the NEEA BOC Dataset) who received their BOC certification in 2018; 2) any previous certificants (i.e., individuals already existing in the NEEA BOC Dataset) with new or updated BOC certification or expiration years; 3) any certificants who received their BOC certification, but had a work state outside of the Northwest; and 4) any records with missing BOC certification or expiration years or other irregularities.

For the remainder of this memo, any mention of “certificants” includes both TCOC and CBO certificants. Certificants classified as active are all individuals who have received or renewed their credential since 2011. These are individuals for whom NEEA counts energy savings for 2018.

During the initial data review, Research into Action identified 1,022 records that were in the 2018 NEEC data file but not in the NEEA BOC Dataset. Working with NEEC, Research Into Action determined that 1,009 of the 1,022 records were for individuals who did not receive certification. These records were excluded from the 2018 update. Of the remaining 13 records, Research Into Action determined that nine had work locations outside of NEEA territory and four had a 2019 certification date; we will add those four records to the NEEA BOC Dataset during the 2019 update.

The data review activities described above resulted in a final NEEC data file that contained records for 3,259 individuals with BOC certification and employed in the Northwest. Of those, Research Into Action identified 169 new records of certificants (that is, records that were not already in the NEEA BOC Dataset) and 3,090 records that matched existing records in the NEEA BOC Dataset. The count of 3,090 matching records is two fewer than the 3,092 that were in the NEEA Dataset as of the 2017 update. One record was not included in the 2018 NEEC data file because the work state was missing. This certificant’s work state was updated by NEEC staff in 2019 and there were no changes to the certification status. The remaining discrepancy is accounted for by NEEC’s exclusion of one record for an individual who received the BOC certification in the Northwest but moved out of state.

Of the 3,090 matching records, 499 had updated Level I or Level II BOC certification or expiration data. Research Into Action added the 169 new certificants to the NEEA BOC Dataset and updated the Level I or Level II BOC certification or expiration data for the other 499 records. For the other 2,591 records, the 2018 NEEC certification data was identical to that already in the NEEA BOC Dataset so there was no need for Research Into Action to update those records. Table 1 summarizes the type of updates made.

Table 1: Summary of Disposition of 2018 NEEC Data File

Type of Record	Count
<i>Number of records received from NEEC, of individuals certified and employed in the Northwest</i>	3,259
New 2018 Certificants or TCOC records added to the NEEA BOC Dataset	169
New record for 2018	166
Existing Record - recertified after savings expired, new record added to NEEA BOC Dataset ¹	3
Records matching existing records in NEEA BOC Dataset	3,090
Updated information	499
Received Level I BOC certification in 1999, but not previously counted ²	1

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Type of Record	Count
Renewals	498
Renewed Level I only	329
Renewed both Level I and Level II	140
Received new Level II and previously had Level I	13
Renewed Level II only	13
Renewed Level I and received Level II	3
No updated information	2,591

1 These three individuals' savings had retired before recertification, but then they recertified in Level I or Level II in 2018, causing them to be newly counted as new certificants in 2018.

2 This individual was not found in the existing NEEA BOC Dataset or the 2017 NEEC data file, but his record indicates certification in 1999.

Updating BOC Certificant Counts in the NEEA BOC Dataset

To update the count of active BOC certificants from 2017, we calculated: 1) the number of new certificants – those certified for the first time in 2018;⁵ 2) the number of prior certificants for whom, starting in 2018, NEEA no longer counts savings (“savings-retired certificants”) – those whose BOC certification had been expired more than five years (the measure life of the certification),⁶ 3) the number of certificants who left the workforce (moved out of the Northwest, retired from work, or died before their savings retired); and 4) the number of certificants who were unemployed in 2018.⁷ Additional details are in *2018 Count of Active Certificants*, below.

NEEA does not calculate savings separately for Level I and Level II BOC certification. Rather, it calculates savings from the first year of BOC certification – whether that was Level I or Level II certification⁸ – to the year before savings retire. For individuals with both BOC Level I and Level II certification and different certification or expiration years for the two levels ($n = 671$), we assigned a single “first year certified” as the earlier year in which the individual received either certification; and we assigned a single “last year certified” as the last year in which that individual received BOC certification at either level – the year before the later of the two expiration years. For example, if a certificant has a Level II

⁵ These included individuals that already had records in the NEEA BOC Dataset but had not received certification as well as new records from NEEC.

⁶ NEEA established this assumption in 2005 (source: RLW Analytics, Inc (2005). Impact and Process Evaluation Building Operator Training and Certification Program. Accessed 3/26/2012 at http://www.theboc.info/pdf/Eval-BOC_NEEP_2005.pdf). Subsequent research has supported the assumption: Navigant Consulting (2011). Long-Term Monitoring and Tracking Report on 2010 Activities. Accessed 11/29/2011 at http://intranet.neea.org/Teams/Market-Planning/TeamWiki/Documents/NEEA_LTMT_Report_2010-11_Revised_2011-06-13%20v02_Confidential.docx, and Research Into action (2013). Final Report: BOC-Expansion Initiative Market Progress Evaluation Report

⁷ NEEC does not track the specific date when a certificant becomes unemployed or regains employment. If the NEEC update file shows someone is unemployed, we make the conservative assumption that they were unemployed the entire year. Any other assumption would complicate the calculation of savings. If a subsequent update shows the individual is employed, we will assume that the individual was employed the entire year.

⁸ Most BOC students who get Level II certification get Level I first, but that is not a requirement, and some students get Level II first or get only Level II.

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BOC certification expiration year later than their Level I BOC certification, the later year will override the earlier year. Table 2 provides an example to illustrate this.

Table 2: Example Computation of First Year Certified and Last Year Certified

Year	Level I	Level II	Certification Status
2002	Received Certification		Certified (Level I)
2003	Renewed Certification	Received Certification	Certified (Level I and II)
2004	Did Not Renew Certification	Renewed Certification	Certified (Level I and II)
2005	Certification Expired	Renewed Certification	Certified (Level II)
2006		Did not Renew Certification	Certified (Level II – Last Year Certified)
2007		Certification Expired	Not Certified

2018 Count of Active Certificants

The NEEC update file identified 166 new records with 2018 certifications and three individuals that recertified in 2017 after their savings had retired for a total of 169 new 2018 records. The updated data also showed 156 certificants whose savings retired that year. In all, the updated combined NEEA BOC Dataset consists of 3,259 individuals employed in NEEA territory that had received certification since 1996, of whom 1,566 are currently active certificants as defined above.

Table 3 shows the year-by-year counts from 1996 through 2018. Each row shows, for a given year, the number of new certificants, the number of prior certificants whose savings have retired (“savings-retired certificants”), and the cumulative number of active certificants. The latter number is equal to the number of continuing certificants from the previous year plus the number of new certificants, minus the number of savings-retired certificants.

The number of “active” certificants in any given year also should exclude the total number of prior certificants who retired from work or died before their savings retired or who were unemployed in that year. The NEEC BOC database does not record the year of death, work retirement, or unemployment, so we could not subtract such individuals from any given year’s cumulative total when we first identified the need to do so in 2014. In that year, we identified 17 individuals who reported work retirement or were deceased before their savings would have retired and eight who were unemployed, for a total of 25. Since we could not subtract them from any given year’s cumulative total, we subtracted them from the 2013 cumulative total and instituted a procedure to identify new cases of individuals leaving the workforce before savings retirement going forward.

By comparing each year’s new NEEC BOC data file to the NEEA BOC Dataset, we can identify the year of all new individuals who left the workforce before their savings would have retired. The combined 2018 BOC Dataset shows 25 additional individuals who left the workforce before their savings retired (six in 2014, five in 2015, none in 2016, six in 2017, and eight in 2018). This includes those certificants that died, retired, or who were unemployed or gained employment outside of the Northwest. We included those 25 individuals in the counts of “Saving Retired or Left Workforce” for each respective year.

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Table 4 shows the year-by-year counts of new, retired, and total active certificants by the state the certificant reported working in.

Finally, Table 5 shows the year-by-year counts of new, retired, and total active certificants grouped into NEEC certificants or IBOA certificants. The dataset does not provide comprehensive information on training provider, so we assumed that all certificants that work in Oregon or Washington received certification through NEEC and those that work in Idaho or Montana received IBOA certification.

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Table 3: Market Status of Active Certified Building Operators

Year	Annual New ¹			Saving Retired or Left Workforce Early ²			Re-entered Workforce ³			Cumulative Total Active ⁵
	BOC	BOC-E ⁵	Total	BOC	BOC-E ⁴	Total	BOC	BOC-E	Total	
1996	9	0	9	0	0	0	0	0	0	9
1997	1	0	1	0	0	0	0	0	0	10
1998	61	0	61	0	0	0	0	0	0	71
1999	143	3	146	0	0	0	0	0	0	217
2000	151	0	151	0	0	0	0	0	0	368
2001	102	0	102	0	0	0	0	0	0	470
2002	202	0	202	0	0	0	0	0	0	672
2003	164	0	164	0	0	0	0	0	0	836
2004	93	0	93	6	0	6	0	0	0	923
2005	144	0	144	90	1	91	0	0	0	976
2006	101	0	101	103	0	103	0	0	0	974
2007	105	1	106	75	0	75	0	0	0	1,005
2008	201	3	204	106	0	106	0	0	0	1,103
2009	120	3	123	112	0	112	0	0	0	1,114
2010	174	4	178	86	0	86	0	0	0	1,206
2011	163	17	180	127	0	127	0	0	0	1,259
2012	119	98	217	86	0	86	0	0	0	1,390
2013	48	117	165	77	0	77	0	0	0	1,478
Left workforce ⁶	--	--	---	17	8	25	0	0	0	--

Continued

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Year	Annual New ¹			Saving Retired or Left Workforce Early ²			Re-entered Workforce ³			Cumulative Total Active ⁵
	BOC	BOC-E ⁵	Total	BOC	BOC-E ⁴	Total	BOC	BOC-E	Total	
Subtotal in 2013	2,101	246	2,347	885	9	894	0	0	0	1,453
2014 ⁷	42	170	212	218	1	219	0	0	0	1,446
2015 ⁷	37	192	229	109	0	109	1	1	2	1,568
2016	86	72	158	161	0	161	0	1	1	1,552
2017 ⁷	144	6	150	162	2	164	0	0	0	1,552
2018 ⁷	169	0	169	112	44	156	0	1	1	1,566
Total in 2018	2,579	686	3,265	1,647	56	1,703	1	3	4	1,566

¹ New = first certified in that year.

² Savings Retired = BOC certification expired more than five years. Left Workforce Early = deceased, retired from employment, no longer works in the Northwest, or unemployed before savings would have retired.

³ Re-Entered Workforce = certificant “left workforce early” (see previous footnote) and then re-entered the workforce before savings became retired. This set of columns is necessary to account for the fact that such certificants were not actively contributing to Northwest savings for a specific period of time.

⁴ This column records the year of initial BOC certification for each individual who received any certification in the BOC-E Initiative. This includes 32 students who received their first BOC certification before the BOC-E Initiative began in 2012, and then achieved a second certification through BOC-E in 2012 or later.

⁵ Cumulative Total Active (present year) = Total Active (previous year) + Annual New - Annual Retired, Left Workforce Early, or Unemployed + Re-entered Workforce.

⁶ This row shows the total number of individuals that had left the workforce before their savings would have retired because of work retirement or death (17) and the total unemployed (8) as of 2013. In 2015, we began tracking the year in which the death, work retirement, or unemployment occurred.

⁷ The “Left Workforce Early” column includes six individuals who left the workforce early in 2014, five individuals who left the workforce in 2015, six individuals who left the workforce in 2017, and eight individuals who left the workforce in 2018.

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Table 4: Market Status of Active Certified Building Operators, by State¹

Year	Annual New ¹				Saving Retired or Left Workforce Early ²				Re-entered Workforce ³				Cumulative Total Active ⁴			
	OR	WA	ID	MT	OR	WA	ID	MT	OR	WA	ID	MT	OR	WA	ID	MT
1996	0	0	9	0	0	0	0	0	0	0	0	0	0	0	9	0
1997	0	1	0	0	0	0	0	0	0	0	0	0	0	1	9	0
1998	0	49	12	0	0	0	0	0	0	0	0	0	0	50	21	0
1999	46	80	15	5	0	0	0	0	0	0	0	0	46	130	36	5
2000	53	75	22	1	0	0	0	0	0	0	0	0	99	205	58	6
2001	38	57	0	7	0	0	0	0	0	0	0	0	137	262	58	13
2002	33	123	31	15	0	0	0	0	0	0	0	0	170	385	89	28
2003	11	93	47	13	0	0	0	0	0	0	0	0	181	478	136	41
2004	21	38	2	32	0	0	6	0	0	0	0	0	202	516	132	73
2005	30	88	16	10	20	63	7	1	0	0	0	0	212	541	141	82
2006	16	64	8	13	37	43	23	0	0	0	0	0	191	562	126	95
2007	28	61	10	7	23	49	1	2	0	0	0	0	196	574	135	100
2008	22	120	20	42	19	68	14	5	0	0	0	0	199	626	141	137
2009	18	67	23	15	19	54	31	8	0	0	0	0	198	639	133	144
2010	15	95	3	65	16	40	13	17	0	0	0	0	197	694	123	192
2011	52	100	10	18	26	69	15	17	0	0	0	0	223	725	118	193
2012	69	114	0	34	19	51	7	9	0	0	0	0	273	788	111	218
2013	41	104	9	11	21	48	4	4	0	0	0	0	293	844	116	225
Left workforce ⁶					2	20	2	1								
Subtotal in 2013	493	1,329	237	288	202	505	123	64	0	0	0	0	291	824	114	224

Continued

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Year	Annual New ¹				Saving Retired or Left Workforce Early ²				Re-entered Workforce ³				Cumulative Total Active ⁴			
	OR	WA	ID	MT	OR	WA	ID	MT	OR	WA	ID	MT	OR	WA	ID	MT
2014 ⁷	33	131	23	25	29	110	32	48	0	0	0	0	295	845	105	201
2015 ⁷	35	114	55	25	18	69	15	7	0	2	0	0	312	892	145	219
2016	58	56	32	12	14	68	11	68	0	1	0	0	356	881	166	163
2017 ⁷	27	65	19	39	35	92	16	21	0	0	0	0	348	854	169	181
2018 ⁷	34	97	19	19	53	75	9	19	0	1	0	0	329	877	179	181
Total in 2018	680	1,792	385	408	351	919	206	227	0	4	0	0	329	877	179	181

¹ New = first certified in that year.

² Savings Retired = BOC certification expired more than five years. Left Workforce Early = deceased, retired from employment, no longer works in the Northwest, or unemployed before savings would have retired.

³ Re-Entered Workforce = BOC certificant “left workforce early” (see previous footnote) and then re-entered the workforce before savings became retired. This set of columns is necessary to account for the fact that such certificants were not actively contributing to Northwest savings for a specific period of time.

⁴ This column records the year of initial BOC certification for each individual who received any certification in the BOC-E Initiative. This includes 32 students who received their first BOC certification before the BOC-E Initiative began in 2012, and then achieved a second certification through BOC-E in 2012 or later.

⁵ Cumulative Total Active (present year) = Total Active (previous year) + Annual New - Annual Retired, Left Workforce Early, or Unemployed + Re-entered Workforce.

⁶ This row shows the total number of individuals that had left the workforce before their savings would have retired because of work retirement or death (17) and the total unemployed (8) as of 2013. In 2015, we began tracking the year in which the death, work retirement, or unemployment occurred.

⁷ The “Left Workforce Early” column includes six individuals who left the workforce early in 2014, five individuals who left the workforce in 2015, six individuals who left the workforce early in 2017, and eight who left the workforce in 2018.

Table 5: Market Status of Active Certified Building Operators, by NEEC and IBOA Certificants¹

Year	New		Saving Retired or Left Workforce Early		Re-Entered Workforce		Cumulative Total Active	
	NEEC	IBOA	NEEC	IBOA	NEEC	IBOA	NEEC	IBOA
1996	0	9	0	0	0	0	0	9
1997	1	0	0	0	0	0	1	9
1998	49	12	0	0	0	0	50	21
1999	126	20	0	0	0	0	176	41
2000	128	23	0	0	0	0	304	64
2001	95	7	0	0	0	0	399	71
2002	156	46	0	0	0	0	555	117
2003	104	60	0	0	0	0	659	177
2004	59	34	0	6	0	0	718	205
2005	118	26	83	8	0	0	753	223
2006	80	21	80	23	0	0	753	221
2007	89	17	72	3	0	0	770	235
2008	142	62	87	19	0	0	825	278
2009	85	38	73	39	0	0	837	277
2010	110	68	56	30	0	0	891	315
2011	152	28	95	32	0	0	948	311
2012	183	34	70	16	0	0	1,061	329
2013	145	20	69	8	0	0	1,137	341
Left workforce < 2014			22	3				
Subtotal in 2013	1,822	525	707	187	0	0	1,115	338
2014	164	48	139	80	0	0	1,115	338
2015	149	80	87	22	2	0	1,204	364
2016	114	44	82	79	1	0	1,237	329
2017	92	58	127	37	0	0	1,202	350
2018	131	38	128	28	1	0	1,206	360
Total in 2017	2,472	793	1,270	433	4	0	1,206	360

¹ Annual New = BOC certified in that year. Annual Retired = did not receive a new certification or renewal within the previous five years. Total Active (present year) = Total Active (previous year) + Annual New – Annual Retired.

- ² For each column, total inactive is the sum of savings retired, work retired or deceased before savings retired, and unemployed.
³ For each column, total active is the sum of total new minus total inactive.

BOC Expansion Attributes

The NEEA BOC Dataset includes information relevant to the BOC expansion (BOC-E) efforts between 2012 and 2017. As of 2018, NEEA is no longer tracking BOC-E related information on certificates. The NEEA BOC Dataset identifies individuals who attended any of three types of classes introduced through the Initiative: *Large Employer*, or classes formed through the Initiative’s outreach to large employers; *Underserved*, or classes held in previously underserved areas; and *Online*, or classes that incorporate online modules. The dataset also identifies individuals who are members of any of four groups that the Initiative has targeted: certificants that received training from the International Union of Operating Engineers (IUOE); returning veterans who served in Afghanistan or Iraq (2001 to 2012); federal employees; and the unemployed. For brevity, this memo refers to having received training in the three BOC-E classes and membership in the four targeted groups as BOC-E “attributes.”

As of 2017, 676 individuals have one or more of the above attributes. Of those individuals, 626 received BOC certification for the first time from 2012 through 2017 (“new BOC certificants”) and 50 had received BOC certification before 2012 (typically Level I) but received an additional certification through BOC-E (typically Level II) from 2012 through 2017 (“continuing BOC certificants”).⁹ Table 6 shows counts for various attributes of BOC-E certificants.¹⁰

When NEEA launched the BOC-E initiative, it targeted unemployed trainees as well as veterans who served from 2001 to 2012 (the Afghanistan and Iraq era); it also tracked veterans who served before 2001. As of the year of this report, BOC-E does not target the unemployed, but continues to track them in the NEEA BOC Dataset (Table 7).

⁹ Some BOC certificants are both “new” and “continuing” as they received a Level I certification between 2012 and 2016 and Level II in 2017 – therefore they were counted as “new” for the Level I certification and as “continuing” for Level II.

¹⁰ As individuals may possess more than one of the attributes found in the table, the total of the line items may exceed the total of unique BOC-E certificants.

Table 6: BOC Expansion Special Class Type (Multiple Selections Allowed; n = 676)

Attribute Type	New BOC-E Certificants ¹							Continuing BOC-E Certificants Receiving Additional Certification ²							All BOC-E Certificants						
	'12	'13	'14	'15	'16	'17	Total	'12	'13	'14	'15	'16	'17	Total	'12	'13	'14	'15	'16	'17	Total
ATTENDED SPECIAL BOC-E CLASS																					
Large Employer	37	72	96	60	23	3	291	0	18	5	8	1	0	32	37	90	101	68	24	3	323
Under-served	25	46	70	114	47	2	304	0	9	1	7	0	0	17	25	55	71	121	47	2	321
Online Class	0	12	93	25	2	0	132	0	0	1	0	0	0	1	0	12	94	25	2	0	133
Attended Any Special Class ³	61	103	165	188	72	5	594	0	26	6	15	1	0	48	61	129	171	203	73	5	642
TARGETED GROUP																					
IUOE is Education Provider	0	10	1	0	0	0	11	0	0	0	0	0	0	0	0	10	1	0	0	0	11
Federal Employee	1	2	10	26	1	0	40	0	0	1	0	0	0	1	1	2	11	26	1	0	41
Un-employed	24	1	0	0	0	0	25	0	3	0	0	0	0	3	24	4	0	0	0	0	28
In Any Targeted Group ⁴	25	13	11	26	1	0	76	0	3	1	0	0	0	4	25	16	12	26	1	0	80
ANY BOC-E ATTRIBUTE (ATTENDED SPECIAL CLASS OR IS IN TARGETED GROUP)																					
Any BOC-E Attribute ⁵	84	111	166	188	72	5	626	0	28	6	15	1	0	50	84	139	172	203	73	5	676

¹ These are individuals who received their initial BOC certification between 2012 and 2017.

² These are individuals who: a) received their initial BOC certification before 2012 and then received a second certification between 2012 and 2017; or b) received their initial BOC certification in 2012 and then received a second certification between 2013 and 2017. Since BOC-E began in 2012, there are no continuing BOC-E certificants in that year.

³ Large employer, underserved, and/or online class. An individual may be in more than one of these three groups. Therefore, this number does not equal the sum of the counts for the three special classes.

⁴ Includes IUOE as education provider, federal employee, and unemployed. Initially also included veterans, but those are no longer targeted.

To: Amy Webb, Project Manager, MR&E, NEEA
Re: 2018 BOC Program Dataset Analysis

⁵ Includes large employer, underserved, online class, IUOE as education provider, federal employee, and unemployed. Some respondents were in more than one of these groups; therefore, this count is not the sum of the various other counts.

Table 7: Other Tracked Associations (Multiple Selections Allowed; $n = 195$)¹

Association	Pre-2012	2012	2013	2014	2015	2016	2017	Total
Returning Veteran (pre-2001)	4	21	22	21	25	14	0	107
Returning Veteran (2001-2012)	0	4	6	5	8	6	0	29
IUOE Other Than as Education Provider	11	16	9	18	16	1	1	72
Any of the above	15	38	35	40	46	20	1	195

¹ Counts from this table are separate from the counts in Table 6.