

California Energy Commission

## STAFF REPORT

# Mechanical Acceptance Test Technician Certification Provider Application: NEBB

Energy Commission Staff Compliance Review to the  
2013 California Building Energy Efficiency Standards

California Energy Commission

*Edmund G. Brown Jr., Governor*



November 2015 | CEC-400-2015-045

# California Energy Commission

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## **ACKNOWLEDGEMENTS**

Staff would also like to take this time to thank Mr. Vic Congi posthumously. This application would not have been possible without Vic's tireless efforts to make it a priority within the National Environmental Balancing Bureau, as well as his instrumental role in the drafting.



## ABSTRACT

Staff evaluated the National Environmental Balancing Bureau, Inc. (NEBB) application, which was submitted on June 16, 2014, under Title 24, Part 1, Chapter 10, Section 10-103-B(f) of the *2013 Building Energy Efficiency Standards*. Staff determined the application submitted by NEBB complies with the requirements of Title 24, Part 1, Chapter 10, Section 10-103-B(c) with the exception of demonstrating the immediate operation of the web-based registry and the hands-on training program. However, staff is reasonably confident that NEBB is capable of securing the necessary resources to provide all required training, testing, and support activities to be approved as an Acceptance Test Technician Certification Provider (ATTCP). If approved, the NEBB Application represents the first Mechanical ATTCP that does not require union affiliation of any kind of its certified technicians. This is important for the Energy Commission to consider prior to determining if the 10-103B(b) requirement has been met, which mandates that the technicians be certified for acceptance testing.

Staff recommends the approval of the NEBB Application with conditions of approval that will:

1. Implement the registry.
2. Provide a memorandum of understanding with accredited training facilities for the required laboratory training and testing.
3. Demonstrate access to facilities capable of performing all necessary mechanical systems acceptance tests and provide annual verification that the laboratories can offer all acceptance test procedures.
4. Provide notification of any loss of access to any laboratory for which a signed agreement was in existence and identify sufficient replacement centers to perform all necessary mechanical systems acceptance tests.

**Keywords:** Nonresidential Mechanical Acceptance Test Technician Certification Provider, National Environmental Balancing Bureau, NEBB, HVAC, registry, ESCO, Title 24

Please use the following citation for this report:

Brumley, Randy and Joe Loyer. 2015, *Mechanical Acceptance Test Technician Certification Provider Application Review: NEBB*, California Energy Commission, Publication Number: CEC-400-2015-045.



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## EXECUTIVE SUMMARY

The Acceptance Test Technician Certification Provider Program provides training, certification, and oversight of acceptance test technicians who perform the acceptance tests required by the California Energy Commission's *2013 Building Energy Efficiency Standards (Standards)*. Acceptance Test Technician Certification Providers are professional organizations that are required to provide training curriculum for technicians and their employers, certification procedures, complaint resolution (including disciplinary procedures), quality assurance, and accountability measures. Acceptance testing ensures that installed equipment, controls, and systems in nonresidential buildings operate as required by the Standards. The National Environmental Balancing Bureau, Inc. (NEBB), a nonprofit industry organization for professional, nonunionized HVAC contractors, submitted its application to the Energy Commission for approval as a nonresidential mechanical ATTCP on June 16, 2014.

Staff evaluated NEBB's application under criteria and procedures in the California Code of Regulations, Title 24, Part 1, Chapter 10, Section 10-103-B(f), which require staff to review Acceptance Test Technician Certification Provider applications according to the criteria and procedures set forth in Title 24, Part 1, Chapter 10, Section 10-103-B(c). Staff summarized the relevant sections from NEBB's application as they pertain to Title 24, Part 1, Chapter 10, Section 10-103-B(c)1 through Section 10-103-B(c)3. Furthermore, staff assessed whether the application met each corresponding requirement.

NEBB proposes to launch a nonresidential Acceptance Test Technician Certification Provider program allowing each technician to certify on each acceptance test. The intent of this strategy is to be sensitive to the needs of small HVAC commercial contractors who would not benefit from training for all 17 acceptance testing protocols, which they may not use or require. NEBB determined, through an industry study performed by the ESCO Group, that the cost of training and certifying a technician in all protocols may result in the exclusion of California's small HVAC contractors. The ESCO Group convened four groups of subject matter experts to determine the economic effects and produced a white paper, which was included with the application. The white paper estimated the cost of training and certifying a technician for the entire list of acceptance tests to be roughly \$34,300, including the contractor's lost revenue opportunities for the time spent in training.

Small HVAC contractors could pass these expenses along to their customers, which would make them less competitive in the marketplace; however, it is more likely they would have to absorb these costs. Small HVAC commercial contractors who do not have experience in complex systems such as hydronics, chillers, thermal storage systems, or energy management systems generally perform light (small) commercial work, which is a large share of the available work in California. NEBB is composed primarily of small HVAC commercial contractors.

Certification will require all technicians who apply to pass an entrance exam, complete the necessary training, and pass an exit exam for both classroom and laboratory material. The registry is a critical component of the application, as it serves many purposes, which include:

- Application portal.
- Document archive.
- Mechanism for filing complaints.
- Verification tool of certification status.
- A repository for all the required information for which acceptance providers, local building departments, and Energy Commission staff may request.

NEBB will use the online program to perform continuous checks on the efficacy of the forms in process to compare like forms and forms completed by certified technicians. Any abnormalities flagged by the automated system will trigger an investigation. Audits will occur on a scheduled and random basis to ensure consistency. NEBB's standing Oversight and Accountability Committee will review any audit findings to make determinations on disciplinary actions. Auditors who are not in competition with the acceptance test technician in the same local market will be selected to perform these investigations; will have a minimum of five years of field experience; and will possess an acceptance test technician certification in the appropriate acceptance test.

NEBB does not control its own laboratories to provide hands-on experience to technicians. Title 24, Part 1, Chapter 10, Section 10-103-B(c)3A and 10-103-B(c)3B(ii), requires the applicant to detail the curriculum, equipment, and other elements used to meet the requirements of the training and certification. This critical training educates technicians on what they may encounter in the field. NEBB has arrangements with accredited training facilities within California, including the PG&E Training Center, Brownson Technical School, and the North American Training Center, to host the training required for approval. NEBB would develop curriculum, training, procedures, and certification tests for use at these centers. The laboratories would provide appropriate training equipment, qualified instructors, and, if required, examiners that meet or exceed the requirements set forth by NEBB and approved by the Energy Commission. After visiting the proposed facilities, staff determined that the facilities are capable of providing the required training.

### **Recommended Conditions of Approval**

In addition to the generally applicable program requirements, certification as a nonresidential mechanical acceptance test technician certification provider shall have the following conditions of approval (COA):

- **COA-1:** By *Date TBD*,<sup>1</sup> NEBB (or their representatives) must have implemented an online web service with the capability to:

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<sup>1</sup> Approximately 90 days after the Energy Commission has formally approved NEBB's application.

- Limit Acceptance Test Technician access to only acceptance test forms for which they hold valid and current certification.
- Provide a method to complete acceptance test forms bearing an appropriate logo and print a hardcopy for submission to local building authorities.
- Make available contact information and current certificate status of all approved Acceptance Test Technicians and Employers.
  - Web directory must be able to sort (or filter) by name, county, and by each acceptance test for which the Acceptance Test Technician has current certification.
- File complaints to NEBB regarding any Acceptance Test Technician or Employer from local enforcement agencies, other permitting agents, and/or the public.
- Provide monthly (or as requested) analytical reports for quality assurance and other purposes to Energy Commission staff and local enforcement agencies.
- Provide information as requested to appropriate local enforcement agencies and Energy Commission staff.

**Compliance:**

NEBB will demonstrate that the registry is in full operation by allowing Energy Commission staff to enter test data including:

- Registering as a fictitious acceptance test technician and employer.
- Registering as a fictitious builder and submit acceptance test jobs for bid.
- Filing completed fictitious acceptance test forms.
- Producing printed versions of fictitious acceptance test forms.
- Submit “suspicious” acceptance test forms that should be caught by the system.
- File a complaint against one of the fictitious acceptance test technicians entered by staff.
- Produce an analytic report from the system showing all activities of the fictitious acceptance test technician and employers entered by staff.

NEBB will also produce an annual report as prescribed in Title 24, Part 1, Chapter 10, Section 10-103-B(d). The annual report, at a minimum, will include a list of all acceptance test technicians and employers separately, and the total number of acceptance test forms filed for each type of acceptance test by California county.

Once Energy Commission staff is satisfied with the performance of the registry, staff will provide NEBB with a written acknowledgement of compliance.

- **COA-2:** By *Date TBD*,<sup>2</sup> demonstrate access to enough laboratories with the combined capability, if more than one, to perform all necessary mechanical systems acceptance

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<sup>2</sup> Ibid.

tests required in the *2013 Building Energy Efficiency Standards*, Section 120.5 in an instructional setting.

**Compliance:**

Provide Energy Commission staff a copy of a memorandum of understanding signed by NEBB representatives and each facility owner/operator that include the following minimum information:

- The owners/operators of the facilities.
- The addresses of the facilities.
- The acceptance tests to be performed at each facility.
- The signatory parties.
- The signatory date(s).

Energy Commission staff will be granted physical access to each facility to ensure that the facilities are real and capable of providing a laboratory training environment.

Once Energy Commission staff is satisfied with the records submitted, a written acknowledgement of compliance will be provided.

- **COA-3:** By *Date TBD*,<sup>3</sup> a NEBB representative must be assigned to verify that these laboratories in total, if more than one, can complete all acceptance tests procedures as provided by NEBB's acceptance test technician certification provider application.

**Compliance:**

A NEBB representative must submit a signed and dated affidavit stating the following for each training facility identified in COA-2:

- A representative(s) has visited the facility in person.
- A representative(s) has reviewed and has knowledge of NEBB's acceptance test laboratory procedures relevant to the facility.
- A representative(s) will vouch that the laboratory is capable of being used for the educational purposes intended for acceptance test education and testing.

Once Energy Commission staff is satisfied with the records submitted, staff will provide a written acknowledgement of compliance.

- **COA-4:** NEBB must notify the Energy Commission within 10 business days of any loss of access to any laboratory facility for which a signed memorandum of understanding that allowed NEBB to perform mechanical systems acceptance tests required by the *2013 Building Energy Efficiency Standards*, Section 120.5 in an

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<sup>3</sup> Ibid.

instructional setting. Within 90 days of notification, NEBB must identify a sufficient replacement facility.

**Compliance:**

NEBB will provide Energy Commission staff a copy of a memorandum of understanding signed by NEBB representatives and each replacement facility owner/operator that include the following minimum information:

- The owners/operators of the facilities.
- The addresses of the facilities.
- The acceptance tests to be performed at each facility.
- The signatory parties.
- The signatory date(s).

Energy Commission staff will be granted physical access to the facility to ensure that the replacement facility is real and capable of providing the required laboratory training environment.

A NEBB representative must submit a signed and dated affidavit stating the following for each replacement training facility identified:

- A representative(s) has visited the facility in person.
- A representative(s) has reviewed and has knowledge of NEBB's Acceptance Test laboratory procedures relevant to the facility.
- A representative(s) will vouch that the facility is currently capable of being used for the educational purposes intended for acceptance test education and testing.

Once Energy Commission staff is satisfied with the records submitted, staff will provide a written acknowledgement of compliance.

Energy Commission staff has reviewed and determined that the application submitted by NEBB complies with the requirements of Title 24, Part 1, Chapter 10, Section 10-103-B(c) on the conditions set forth. The COA deadlines, which are 90 days after approval, should allow timely resolution of the conditions and will not create an unreasonable burden to comply. Energy Commission staff recommends approval of NEBB's application with the delineated conditions of approval.



# CHAPTER 1:

## Background

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The Acceptance Test Technician Certification Provider (ATTCP) Program provides training, certification, and oversight of acceptance test technicians (ATTs) who perform the acceptance tests required by California's *2013 Building Energy Efficiency Standards*. ATTCPs are professional organizations required to provide training curriculum for technicians and their employers, certification procedures, complaint resolution (including disciplinary procedures), quality assurance, and accountability measures.

Acceptance testing ensures that installed equipment, controls, and systems operate as required by the California Building Energy Efficiency Standards (Standards). Acceptance testing is an effective tool to meet the energy sustainability goals of owners, occupants, and the community. Test findings validate that energy budget shortfalls and inexperienced (or poorly trained) technicians bring increased risk of poor performance and noncompliance to a project that stakeholders cannot tolerate. The benefits of Energy Standards compliance are substantial. Building owners get a building that delivers energy savings, architects and engineers are assured the system designed is the one built, and contractors avoid complaints. Complete and accurate acceptance tests are essential to ensuring energy standards compliance, promoting optimization of efficiency, and ensuring ideal performance for nonresidential buildings. ATTCPs monitor Acceptance Test Employers<sup>4</sup> (ATEs) and acceptance test technicians who perform acceptance testing.

Established in 1971, the National Environmental Balancing Bureau, Inc. (NEBB) is a nonprofit trade association promoting high-performance building systems. NEBB-certified firms provide testing, adjusting, and balancing of environmental systems, commissioning and retro commissioning, sound and vibration measurement, building enclosure testing, fume hood testing, and cleanroom performance testing. NEBB-certified employers have highly skilled specialists who measure the efficiency of building systems and provide customized solutions for business owners. NEBB certification is tangible proof of technician qualifications to perform their work in accordance with NEBB procedural standards.

NEBB submitted an application to the California Energy Commission for approval as a nonresidential mechanical acceptance test technician certification provider on June 16, 2014. The proposed NEBB ATTCP program would open training to all qualified applicants regardless of labor organization affiliation.

NEBB proposes to launch a nonresidential ATTCP program, allowing each technician to certify on each acceptance test. The intent of this modular strategy is to be sensitive to the

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<sup>4</sup> An *Acceptance Test Employer* is a person or entity who employs an acceptance test technician and is certified by an authorized Acceptance Test Technician Certification Provider under the requirements of Sections 10-103-A or 10-103-B.

needs of small HVAC commercial contractors who would not benefit from training which they may not use nor require. NEBB determined, through an industry study performed for all 17 acceptance testing protocols by the ESCO Group,<sup>5</sup> that the cost of training in all protocols is prohibitively expensive and may result in the exclusion of California's small HVAC contractors. The ESCO Group convened four groups of subject matter experts to determine the economic effects and produced a white paper, which NEBB included with the application. The white paper averaged the conclusions of the four groups and estimated that the cost of training and certifying each technician for the entire list of acceptance tests<sup>6</sup> to be roughly \$34,300, including the contractor's lost revenue opportunities during training.

Small HVAC contractors could pass these expenses along to their customers, making them less competitive in the marketplace; however, what is more likely is they would simply absorb these costs. Small HVAC commercial contractors who do not possess or require experience in complex systems such as hydronics, chillers, thermal storage systems, or energy management systems generally perform the majority of the light (small) commercial work, which is a large share of the available work in California. NEBB is composed primarily of nonunionized small HVAC commercial contractors.

This approach relies heavily on an online application developed by ESCO Group (the registry) to be able to control and conduct business with certified technicians and employers by restricting them to only those acceptance tests for which they possess certification.

The registry will:

- Act as the application portal for the certification candidates.
- Retain applications during the review and approval process.
- Retain examination results for no less than seven years.
- Retain all other records for no less than seven years.
- Act as a portal for processing and retaining mechanical compliance forms.<sup>7</sup>
- Act as a portal for processing and retaining mechanical acceptance forms by certificate holders and others.
- Act as the complaint portal.
- Verify that an engineer's, contractor's, and technician's state license is in good standing.
- Provide analytical reports for audit and other purposes.

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5 "Title 24: Practical Application of Mechanical Acceptance Test Technician Certification," National Environmental Balancing Bureau, April 8, 2015.

6 These acceptance tests are required under Section 120.5 of the Energy Standards. However, the actual procedures to perform the required acceptance tests are documented in Chapter 13 of the *2013 Nonresidential Compliance Manual*.

7 This refers to mechanical certificates of compliance and certificates of installation. The technician is generally required to review these compliance documents as well as other design documentation to perform the acceptance tests.

- Provide information as requested to acceptance providers, appropriate local building departments, and Energy Commission staff.
- Require all certificate holders (ATTs and ATEs) to use only the registry for completing and submitting mechanical acceptance test forms as a condition of their certification.
- Restrict ATTs to performing only those acceptance tests for which they hold certifications.

Another aspect of NEBB's proposal is the fact that NEBB does not own or operate laboratories to provide hands-on experience to technicians. Title 24, Part 1, Chapter 10, Section 10-103-B(c)3A and Section 10-103-B(c)3B(ii) require the applicant to detail the curriculum, equipment, and other elements used to meet the requirements of the hands-on training and certification. This critical training educates technicians on what they may encounter in the field. NEBB is entering into arrangements with accredited training centers within the state, including the PG&E Training Center, Brownson Technical School, and the North American Training Center. NEBB proposes to develop curriculum, training, procedures, and certification tests for use at these centers. The laboratories would provide appropriate training equipment, qualified instructors, and, if required, examiners who meet or exceed the requirements set forth by NEBB and approved by the Energy Commission.

Staff has completed its evaluation of NEBB's application in accordance with Title 24, Part 1, Chapter 10, Section 10-103-B(f), which requires review of ATTCP applications according to the criteria and procedures set forth in Title 24, Part 1, Chapter 10, Section 10-103-B(c). Staff has summarized the relevant sections from NEBB's application as they pertain to Title 24, Part 1, Chapter 10, Section 10-103-B(c)1 through Section 10-103-B(c)3. Furthermore, staff assessed whether NEBB's application meets the requirements. This report emulates the same sections sequence as conveyed in *2013 Building Energy Efficiency Standards* to provide additional clarity.



## **CHAPTER 2: Requirements for Qualifications and Approval of Certification Providers**

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### **Requirement**

Entities that want to be considered as an ATTCP shall submit a written application to the California Energy Commission with an overall summary and all the necessary background documents, including explanations of organization structure, certification procedures, training curriculum, and other supporting material to explain how the criteria and procedures in Section 10-103-B(c) have been met.

### **Summary of Compliance Method for Applicant**

NEBB submitted its application to the Energy Commission for approval as a nonresidential mechanical ATTCP on June 16, 2014.

On July 27, 2015, the Energy Commission approved NEBB's application request seeking confidentiality for curriculum and testing materials as part of its efforts to become a mechanical ATTCP (approval of confidentiality application letter).<sup>8</sup> The confidential material consists of curriculum and training modules addressing various technical areas an acceptance technician would need to demonstrate competence before being certified.

### **Staff Assessment**

Staff performed an analysis of how the confidential portions of NEBB's application met the requirements of Section 10-103-B(c). Results indicate complete compliance with the *2013 Building Energy Efficiency Standards* (Section 10-103-B).

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<sup>8</sup> The original letter was docketed 13-ATTCP-01, TN 72379, November 26, 2013, and extended on July 27, 2015, to include these new submissions.



# CHAPTER 3: Requirements for Applicant ATTCPs to Document Organizational Structure

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## Requirements

The ATTCP shall provide written explanations of the organization type, bylaws, and ownership structure. The ATTCP shall explain in writing how its certification program meets the qualifications of *2013 Building Energy Efficiency Standards*, Section 10-103-B(c), and how its organizational structure and procedures include independent oversight, quality assurance, supervision, and support of the acceptance test training and certification processes.

## Summary of Compliance Method for Applicant

NEBB identifies itself as a nonprofit trade association. The NEBB by-laws stipulate, in “Article II Objectives and Purposes,” the intent of the trade association is to develop standards, procedures, and programs to ensure state-of-the-art performance in new and existing buildings with respect to NEBB disciplines. These disciplines include:

- Testing/adjusting/balancing of environmental systems.
- Sound measurement testing.
- Vibration measurement testing.
- Cleanroom performance testing.
- Whole-building systems technical commissioning.
- Fume hood performance testing.
- Technical retro commissioning of existing buildings.
- Building enclosure testing.
- Any other discipline the board of directors deems appropriate.

NEBB’s bylaws explain that affiliation with NEBB is for the exclusive purpose of certification in one or more of the disciplines of NEBB. The NEBB Board of Directors governs NEBB’s affairs. In addition, NEBB has established a certification board for governance and administration of personnel certification programs to increase the quality of testing of building systems by recognizing competent professionals and technicians. NEBB’s Title 24 Oversight and Accountability Program includes quality assurance, independent oversight, and accountability measures including, but not limited to, independent oversight of the certification processes and procedures, computer-generated reports for ATT and ATE activity, onsite auditor visits, certification process evaluations, complaint resolution, building department surveys, and expert review of the training curricula.

NEBB explains the efficacy of the certification process; how its organizational structure and procedures include independent oversight, quality assurance, supervision; and support of the acceptance test training and certification processes. NEBB provided the confidential educational material for each acceptance test procedure to the Commission for review.

## Staff Assessment

NEBB is a nonprofit trade association that is tax exempt under the Internal Revenue Code Section 501(c)(6). The NEBB application includes an Employer Identification Number (EIN) 23-7180848. Staff has verified through the IRS that this EIN is registered to NEBB and that NEBB is a 501(c)(6)-exempt organization in good standing.

The bylaws provided by NEBB are consistent with an affiliation serving the industry interests to assure quality products and services. The organization has the appropriate structure, which includes the standing committees, board of directors, and appointed officers, oversight, management, and program support. Staff believes the annual audit program described in the application will viably ensure a quality certification process. Although the qualified reviewers (who represent independent oversight of the overall program) described in the application may have indirect financial interests in NEBB, staff is convinced that since the selected reviewers shall be outside the competitive marketplace of the acceptance testing technician being reviewed, it is reasonable for them to provide the required impartiality. Staff agrees the organization is in direct control of the proposed ATT/ATE application. The submitted educational material and proposed certification processes are consistent with the goals of the ATTCP requirements. A summary of compliance to Section 10-103-B(c)1 of the *2013 Building Energy Efficiency Standards* is found in Table 1.

**Table 1: Summary of Application Compliance (Section 10-103-B[c]1)**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Organization Type	501(C)(6) - Non-Profit Trade Association	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ownership Structure	Non-profit	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bylaws	Bylaws of the NEBB.pdf, pages 1-14.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Quality Assurance of the Certification Process	Bylaws of the NEBB.pdf, Annual Audit Section, pages 17-20.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Independent Oversight	Bylaws of the NEBB.pdf, NEBB Title 24 Oversight and Accountability Committee, page 14	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supervision	Bylaws of the NEBB, Article VII Certification Board, pages 6-7	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Support of Acceptance Test Training and Certification Processes	Mechanical (MCH) Training Modules	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff

# CHAPTER 4:

## Requirement for Certification of Employers

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### Requirement

The ATTCPs shall provide written explanation of certification and oversight of ATEs to ensure quality control and appropriate supervision and support for ATTs.

### Summary of Compliance Method for Applicant

The NEBB application describes the eligibility requirements for becoming a nonresidential mechanical ATE. The ATE applicant must have completed at least four hours of instruction covering the scope and process of the acceptance tests described in Section 120.5 of the *2013 Building Energy Efficiency Standards*. The ATE applicant must also have read a summary of the code sections related to the specific forms in which he or she is seeking certification. Once NEBB has determined the applicant has complied with these requirements, NEBB will administer a timed and sealed ATE certification test that NEBB will score. The first part of the test contains questions relating to current code as it pertains to acceptance testing conducted in an “open book” format, and the second part is “closed book” containing questions related to the employer’s administrative responsibilities and NEBB oversight policies.

NEBB-certified ATEs must comply with:

- Use of the registry (failure to do so will result in revocation of certification).
- ATTCP protocols and regulations.
- California Code of Regulations, Title 24.
- Applicable registration, insurance, licensing, and bonding mandates and maintain proof of same.
- Warrant that at least one executive has completed the ATE certification course.
- Submission of copies of acceptance tests performed by its ATTs to the NEBB ATTCP within 10 business days of completion (beginning in 2015).
- Submission of records of financial data that substantiate ATTCP-related work to NEBB upon request.
- Notifying NEBB within 48 hours if its contractor’s license or business license has been revoked or suspended.
- Notifying NEBB within 48 hours if the employer or any official or executive of the employer has been found guilty of a felony in the court of law or has been found liable in a civil litigation.

NEBB includes a decertification process for ATEs who misrepresent NEBB by:

- Falsification of data and reports.
- Failure to maintain eligibility.

- Failure to meet the code of conduct.
- Failure to meet certification obligations and other causes.

NEBB also requires that ATEs renew certifications with the latest version of the energy standards.

## Staff Assessment

Staff finds that the above requirements for eligibility submitted by NEBB for its certification of potential ATEs meet the requirements of Section 10-103-B(c)2. Furthermore, the testing procedures are accommodating and reasonably secure. The proposed training is consistent with the regulatory requirements. Therefore, staff determines the applicant’s procedures satisfy the requirements. Staff agrees the testing procedures give NEBB the tools necessary to provide oversight of acceptance test employers. A summary of compliance to the *2013 Building Energy Efficiency Standards* (Section 10-103-B[c]2) can be found in Table 2.

**Table 2: Summary of Application Compliance (Section 10-103-B[c]2)**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Certification of ATE	Bylaws of NEBB, ATE Certification Section, pages 19-20	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oversight of ATE	Bylaws of NEBB, Recertification Section, page 20	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff

# CHAPTER 5: Requirements for Hands-On Experience and Theoretical Training

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## Requirements

ATTCPs shall provide both hands-on experience and theoretical training such that ATTs may demonstrate their abilities to apply the *2013 Building Energy Efficiency Standards* acceptance testing and documentation requirements to a comprehensive variety of mechanical systems and controls that are reflective of the range of systems encountered in the field.

## Summary of Compliance Method for Applicant

The proposed NEBB ATTCP program permits each technician to certify on each acceptance test. The intent of this approach is to be sensitive to the needs of small HVAC commercial contractors who would not benefit from training for all 17 acceptance test protocols that they will not use or require for their business models. As stated in Chapter 1, NEBB determined, through an industry study performed<sup>9</sup> by the ESCO Group, that the cost of training and certifying a technician in all protocols may result in the exclusion of California's small HVAC contractors.

In an effort to be responsive to its membership and inclusive of the small HVAC commercial contractor in general, NEBB developed an ATTCP application that allows each contractor to certify on only those acceptance tests that they will actually use.

Each ATT will select the acceptance test he or she wishes to receive training on and will submit an application for that particular test to the provider. Prior to admittance, applicants must show their understanding of the material on an entrance exam. After receiving instruction on the acceptance test concepts and procedures, the ATT will then take an exit exam. If the ATT receives a passing score as determined by NEBB, the ATT will gain certification for that particular acceptance test.

NEBB's approach relies on an online data registry (registry) to monitor certified technicians and employers and restrict them to only those acceptance tests for which they possess certification. Certification will require all applicants to pass an entrance exam, complete the necessary training, and pass an exit exam for both classroom and laboratory material for each mechanical acceptance test.

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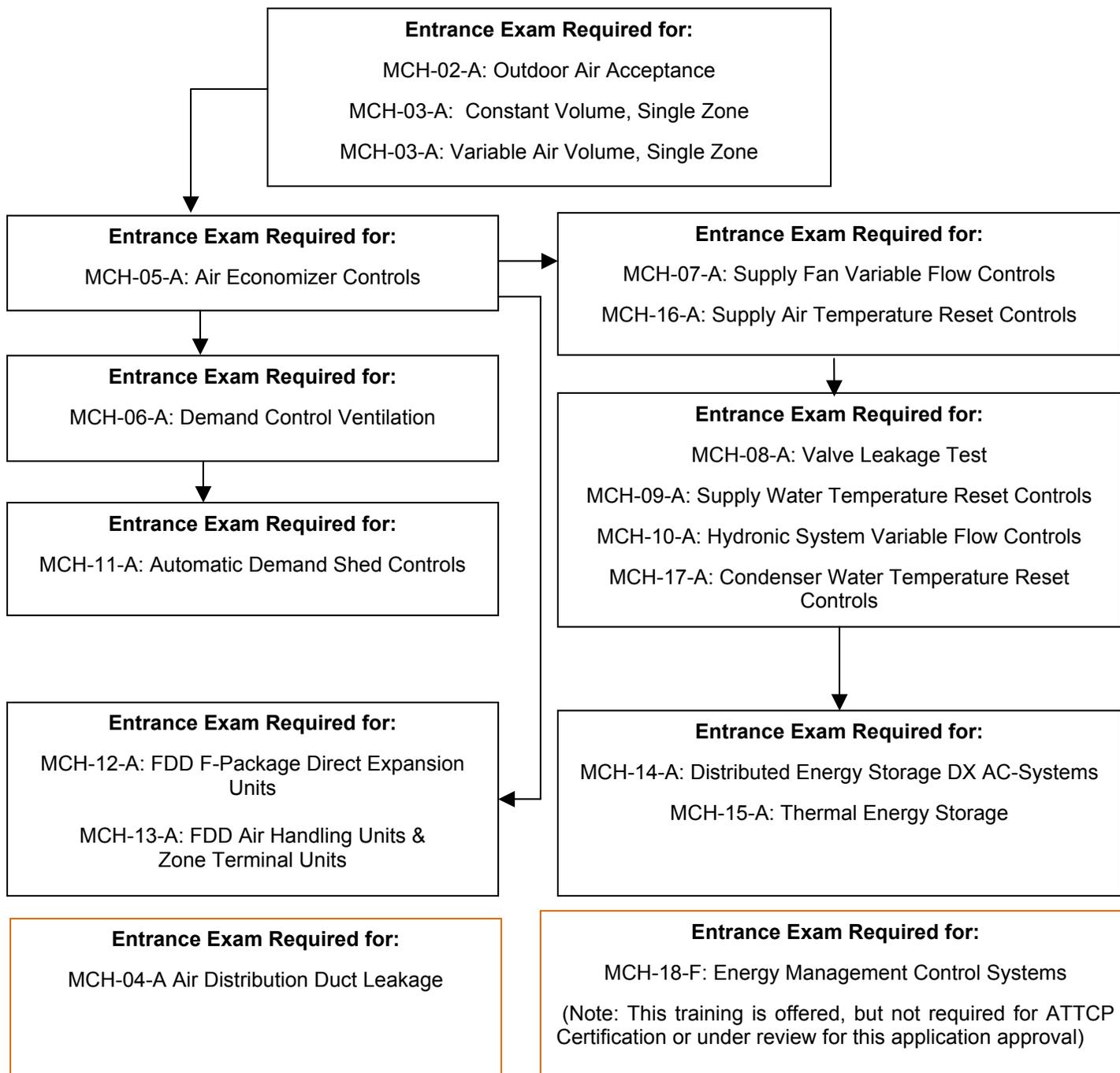
<sup>9</sup> Ibid.

The theoretical and laboratory training proposed by NEBB for ATTs includes classroom training with hands-on demonstrations in all mechanical acceptance tests specified by the *2013 Building Energy Efficiency Standards*, Section 120.5. The training has 17 modules that include covering all of Appendix NA7.5 (Subsections 1 through 17) “Installation and Acceptance Requirements for Nonresidential Buildings and Covered Processes” in the *2013 Building Energy Efficiency Standards Nonresidential Appendices*.

For the basic mechanical acceptance test (MCH-02-A and MCH-03-A), the prerequisite is a minimum of three years professional experience. However, for the rest of the acceptance tests, the prerequisites include certification for MCH-02-A and MCH-03-A as indicated in Figure 1, which illustrates the prerequisites required by NEBB for each technical training module. As one progresses down the flowchart (Figure 1), the technical material increases in complexity.

**Figure 1: NEBB Prerequisites for Acceptance Test Training**

Prerequisite for Acceptance Test Technician Certification  
 Three Years of Verifiable Field Experience in HVAC Controls and Systems  
 Plus a Successful Score on the Appropriate Entrance Exam(s)



Technicians that fail an entrance exam may retake the exam after 90 days. There are two versions of each entrance exam. Each version contains several questions (minimum 25 percent) that are different from the other exam.  
 Source: NEBB Application

## Staff Assessment.

Staff has evaluated NEBB's training materials (designated MCH-02 through MCH-17)<sup>10</sup> in accordance with Section 10-103(C)B(1), the certificate of acceptance forms, and the *Nonresidential Building Energy Efficiency Standards Reference Appendices*. Chapter 6 (Hands-on Training) of this report contains staff's assessment of whether the laboratory training proposed complies with Section 10-103-B(c)3B(ii).

Table 3 displays how each training module that NEBB submitted corresponds to each of the 17 subsections of Section 10-103(C)B(1) for which compliance was evaluated. Table 3 clarifies the numbering schemes encountered across the references. NEBB has its training materials for constant and variable volume control systems consolidated under the same MCH-02 heading. Staff finds the labeling acceptable for its purposes and does not foresee any confusion as the two modules are differentiated with the more common designations, constant air volume and variable air volume, within the documents. In addition, NEBB submitted the training module, MCH-18 Energy Management Control Systems, within its application; however, staff omitted this material from its review, as it is not applicable to ATTCP approval.

**Table 3: Summary Table of NEBB Training Material to Energy Commission Standards**

<b>Section 10-103(C)3B(i)(a-o)</b>	<b>Acceptance Test Form Name</b>	<b>2013 Reference Appendices</b>	<b>NEBB Training Module Document Name</b>
Constant Volume System Controls	NRCA-MCH-03-AC Constant Volume, Single Zone, Unitary (Packaged & Split) AC & Heat Pump Systems	NA7.5.2 Constant Volume, Single Zone, Unitary AC & Heat Pump Systems	MCH-02-AC Constant Volume Systems Outdoor Air Acceptance ppt.pdf MCH-02-AV Variable Air Volume Systems Outdoor Air Acceptance ppt.pdf MCH-03 Constant Volume, Single-Zone, Unitary Air Conditioner, and Heat Pump Systems Acceptance ppt.pdf
Variable Volume System Controls	NRCA-MCH-02-ACV Outdoor Air Acceptance	NA7.5.1 Outdoor Air	MCH-02 Variable Air Volume Systems Outdoor Air Acceptance ppt.pdf
Air-Side Economizers	NRCA-MCH-05-A Air Economizer Controls Acceptance	NA7.5.4 Air Economizer Controls	MCH-05-A Air Economizer Acceptance Review 071715 ppt.pdf
Air Distribution System Leakage	NRCA-MCH-04-H Air Distribution Duct Leakage	NA7.5.3 Air Distribution Systems	MCH-04 Air Distribution Systems Acceptance Review 061515 ppt.pdf
Demand Controlled Ventilation With CO <sub>2</sub> Sensors	NRCA-MCH-06-A Demand Control Ventilation (DCV) Systems Acceptance	NA7.5.5 Demand Control Ventilation (DCV) Systems	MCH-06-A DCV Systems Acceptance ppt.pdf

<sup>10</sup> The acceptance test requirements and procedures are numbered from MCH-02 to MCH-17. MCH-01 was a simple index page that was used as a preamble to the acceptance test hardcopy report (to local building departments) and was deleted a requirement from the *2008 Building Energy Efficiency Standards*.

<b>Section 10-103(C)3B(i)(a-o)</b>	<b>Acceptance Test Form Name</b>	<b>2013 Reference Appendices</b>	<b>NEBB Training Module Document Name</b>
Automatic Demand Shed Controls	NRCA-MCH-11-A Automatic Demand Shed Control Acceptance	NA7.5.10 Automatic Shed Control Acceptance	MCH-11 Automatic Demand Shed Control Acceptance ppt.pdf
Hydronic Valve Leakage	NRCA-MCH-08-A Valve Leakage Test	NA7.5.7 Valve Leakage Test	MCH-08-A Valve Leakage Acceptance Review ppt.pdf
Hydronic System Variable Flow Controls	NRCA-MCH-10-A Hydronic System Variable Flow Controls Acceptance	NA7.5.9 Hydronic System Variable Flow Controls	MCH-10-A Hydronic System Variable Flow Controls ppt.pdf
Supply Air Temperature Reset Controls	NRCA-MCH-16-A Supply Air Temperature Reset Controls Acceptance	NA7.5.15 Supply Air Temperature Reset Controls	MCH-16 Supply Air Temperature Reset Controls ppt.pdf
Condenser Water Temperature Reset Controls	NRCA-MCH-17-A Condenser Water Temperature Reset Controls Acceptance	NA7.5.16 Condenser Water Supply Temperature Reset Controls	MCH-17 Condenser Water Supply Temperature Reset Controls ppt.pdf
Outdoor Air Ventilation Systems	NRCA-MCH-02-ACV Outdoor Air Acceptance	NA7.5.1 Outdoor Air	MCH-02 Constant Volume Systems Outdoor Air Acceptance ppt.pdf MCH-02 Variable Air Volume Systems Outdoor Air Acceptance ppt.pdf
Supply Fan Variable Flow Controls	NRCA-MCH-07-A Supply Fan Variable Flow Controls (VFC) Acceptance	NA7.5.6 Supply Fan Variable Flow Controls	MCH-07 Supply Fan Variable Flow Controls Acceptance ppt.pdf
Boiler and Chiller Isolation Controls	NRCA-MCH-09-A Supply Water Temperature Reset Controls Acceptance	NA7.5.8 Supply Water Temperature Reset Controls	MCH-09 Supply Water Temperature Reset Controls Acceptance ppt.pdf
Fault Detection and Diagnostics for Packaged Direct-Expansion Units	NRCA-MCH-12-A Fault Detection & Diagnostics for Air Handling & Zone Terminal Units Acceptance	NA7.5.11 Fault Detection and Diagnostic (FDD) for Packaged Direct-Expansion Units	MCH-12-A-FDD-F-Packaged Direct Expansion Units ppt.pdf
Automatic Fault Detection and Diagnostics for Air Handling Units and Zone Terminal Units	NRCA-MCH-13-A Automatic Fault Detection & Diagnostics for Air Handling & Zone Terminal Units Acceptance	NA7.5.12 Automatic Fault Detection and Diagnostic (FDD) for Air Handling Units and Zone Terminal Units	MCH-13-A-FDD-AirHandlingUnits & Zone Terminal Units ppt.pdf

<b>Section 10-103(C)3B(i)(a-o)</b>	<b>Acceptance Test Form Name</b>	<b>2013 Reference Appendices</b>	<b>NEBB Training Module Document Name</b>
Distributed Energy Storage Direct-Expansion Air Conditioning Systems	NRCA-MCH-14-A Distributed Energy Storage DX AC Systems Acceptance	NA7.5.13 Distributed Energy Storage DX AC System Acceptance Tests	MCH-14-A-DistributedEnergyStorageDX-AC-Systems ppt.pdf
Thermal Energy Storage Systems	NRCA-MCH-15-A Thermal Energy Storage (TES) System Acceptance	NA7.5.14 Thermal Energy Storage (TES) Systems	MCH-15-A-ThermalEnergyStorage

Source: Energy Commission staff

A summary of compliance to the *2013 Building Energy Efficiency Standards* (Section 10-103-B[c]3A) can be found in Table 4.

**Table 4: Summary of Application Compliance (Section 10-103-B[c]3A)**

<b>REQUIREMENT</b>	<b>APPLICATION LOCATION</b>	<b>ADEQUATE</b>	<b>INFORMATION REQUEST</b>
Theoretical Training	Mechanical (MCH) Training Modules	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hands-On Experience	California (CA) Acceptance Labs	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff

# CHAPTER 6:

## Requirements for Mechanical Acceptance Test Technician Training Curricula

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### Requirement

ATTCPs shall provide a complete copy of all training and testing procedures, manuals, handbooks, and materials. ATTCPs shall provide a written explanation of how training and certification procedures include, but are not limited to, the Subsections 10-103-B(c)3A through 10-103-B(c)3G.

ATTCP training curricula for mechanical ATTs shall include, but not be limited to, the analysis, theory, and practical application of:

- a) Constant volume system controls.
- b) Variable volume system controls.
- c) Air-side economizers.
- d) Air distribution system leakage.
- e) Demand-controlled ventilation with CO<sub>2</sub> sensors.
- f) Demand-controlled ventilation with occupancy sensors.
- g) Automatic demand shed controls.
- h) Hydronic valve leakage.
- i) Hydronic system variable-flow controls.
- j) Supply air temperature reset controls.
- k) Condenser water temperature reset controls.
- l) Outdoor air ventilation systems.
- m) Supply fan variable-flow controls.
- n) Boiler and chiller isolation controls.
- o) Fault detection and diagnostics for packaged direct-expansion units.
- p) Automatic fault detection and diagnostics for air-handling units and zone terminal units.
- q) Distributed energy storage direct-expansion air conditioning systems.
- r) Thermal energy storage systems.

- s) *Building Energy Efficiency Standards* mechanical acceptance testing procedures.
- t) *Building Energy Efficiency Standards* acceptance testing compliance documentation for mechanical systems.

## Summary of Compliance Method for Applicant

NEBB submitted all the mechanical (MCH) training material listed above to cover the curricula requirements listed in Section 10-103-B(c)B(i). The technical material is confidential; therefore, staff's evaluation of its compliance is available only in this public document.

## Staff Assessment

Staff evaluated the confidential materials in accordance with the *Nonresidential Compliance Manual* for the *2013 Building Energy Efficiency Standards* (and the *2013 Nonresidential Appendix*). Staff reviewed all the training materials and determined NEBB provides adequate documentation to comply with the mechanical acceptance testing requirements of Section 10-103-B(c)3B(i). A summary of compliance to the *2013 Building Energy Efficiency Standards* (Section 10-103-B[c]3B[i]) is found in Table 5.

**Table 5: Summary of Application Compliance (Section 10-103-B[c]3B(i))**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Constant Volume System Controls	MCH-02 Constant Volume Systems Outdoor Air Acceptance ppt.pdf MCH-02 Variable Air Volume Systems Outdoor Air Acceptance ppt.pdf MCH-03 Constant Volume, Single Zone, Unitary Air Conditioner and Heat Pumps Systems Acceptance ppt.pdf	☒	☐
Variable Volume System Controls	MCH-02 Variable Air Volume Systems Outdoor Air Acceptance ppt.pdf	☒	☐
Air-Side Economizers	MCH-05-A Air Economizer Acceptance Review 071715 ppt.pdf	☒	☐
Air Distribution System Leakage	MCH-04 Air Distribution Systems Acceptance Review 061515 ppt.pdf	☒	☐
Demand Controlled Ventilation With CO <sub>2</sub> Sensors	MCH-06-A DCV Systems Acceptance ppt.pdf	☒	☐
Automatic Demand Shed Controls	MCH-11 Automatic Demand Shed Control Acceptance ppt.pdf	☒	☐

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Hydronic Valve Leakage	MCH-08-A Valve Leakage Test Acceptance review ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hydronic System Variable Flow Controls	MCH-10-A Hydronic System Variable Flow Control ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supply Air Temperature Reset Controls	MCH-16 Supply Air Temperature Reset Controls ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Condenser Water Temperature Reset Controls	MCH-17 Condenser Water Supply Temperature Reset Controls ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Outdoor Air Ventilation Systems	MCH-02 Constant Volume Systems Outdoor Air Acceptance ppt.pdf MCH-02 Variable Air Volume Systems Outdoor Air Acceptance ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supply Fan Variable-Flow Controls	MCH-07 Supply Fan Variable Flow Controls Acceptance ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boiler and Chiller Isolation Controls	MCH-09 Supply Water Temperature Reset Controls Acceptance ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fault Detection and Diagnostics for Packaged Direct-Expansion Units	MCH-12 FDD for Packaged DX Units ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Automatic Fault Detection and Diagnostics for Air Handling Units and Zone Terminal Units	MCH-13-A FDD Air Handling Units and Zone Terminal Units ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Distributed Energy Storage Direct-Expansion Air Conditioning Systems	MCH-14 Distributed Energy Storage DX AC Acceptance ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Thermal Energy Storage Systems	MCH-15 Thermal Energy Storage (TES) System ppt.pdf	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Energy Code Mechanical Acceptance Testing Procedures	Mechanical (MCH) Training Modules; Bylaws of the NEBB, Technical Certification Section	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Energy Code Acceptance Testing Compliance Documentation for Mechanical Systems	Mechanical (MCH) Training Modules, Bylaws of the NEBB	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff



# CHAPTER 7:

## Requirements for Hands-On Training

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### Requirement

The ATTCP shall describe in its application the design and technical specifications of the laboratory boards, equipment, and other elements that will be used to meet the hands-on requirements of the training and certification.

### Summary of Compliance Method for Applicant

NEBB has arranged for three accredited training centers in California (the PG&E Training Center in San Francisco, Brownson Technical School in Los Angeles County, and the North American Training Center in Los Angeles County) to host the training required for approval, since NEBB does not control any training centers capable of providing hands-on training in California. NEBB would develop curriculum, training, procedures, and certification tests for use at these centers. The laboratories would provide appropriate training equipment, qualified instructors, and, if required, examiners that meet or exceed the requirements set forth by NEBB and approved by the California Energy Commission.

### Staff Assessment

Hands-on (or laboratory) education and experience allows ATTs to apply the knowledge they gain in the classroom on evaluating situations and applying troubleshooting procedures during HVAC system installation or maintenance to fieldwork.

Staff visited NEBB's proposed facilities and determined the centers are capable of providing the required training. Nevertheless, NEBB needs to demonstrate access to enough centers with the combined capability to perform all necessary mechanical systems acceptance tests required in the *2013 Building Energy Efficiency Standards* (Section 120.5) in an instructional setting.

Staff recommends as a condition of approval that NEBB provide a signed memorandum of understanding (MOU) with each facility owner/operator:

- The owner/operator of the facilities.
- The facility address.
- The applicable acceptance tests.
- The effective dates of the MOU.
- Names of the signatory parties.

NEBB must also assign a representative(s) to verify that these laboratories in total - if more than one - can complete all acceptance tests procedures as provided by the NEBB ATTCP

application. A NEBB representative(s) must submit a signed and dated affidavit stating at a minimum that:

- A NEBB representative has visited the facility in person.
- Someone knowledgeable in the subject matter has reviewed the acceptance test laboratory procedures.
- The facility is capable of providing education for NEBB on acceptance testing.

Staff also recommends as a condition of approval that NEBB notify the Energy Commission within 10 days of any loss of access to any laboratory for which a signed memorandum of understanding was in existence and within 90 days of notification, NEBB must identify sufficient replacement facilities.

A summary of compliance to Section 10-103-B(c)3B(ii) of the *2013 Building Energy Efficiency Standards* is found in Table 6.

**Table 6: Summary of Application Compliance (Section 10-103-B[c]3B[i])**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Hands-On Experience	California (CA) Acceptance Laboratories	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff

# CHAPTER 8:

## Requirements for Prequalification

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### Requirement

Participation in the technician certification program shall be limited to persons who have at least three years of verifiable professional experience and expertise in mechanical controls and systems as determined by the mechanical ATTCPs to demonstrate an ability to understand and apply the mechanical ATT certification training. The criteria and review processes used by the ATTCP to determine the relevance of technician professional experience shall be described in the ATTCP application to the California Energy Commission.

### Summary of Compliance Method for Applicant

NEBB proposed a certification process that requires two items from each ATT applicant. First as a prerequisite, the technician must demonstrate three years of verifiable field experience and expertise in HVAC controls and systems of the specific acceptance test as determined by NEBB. Secondly, the applicant must pass a written entrance exam to show a competency level to perform acceptance tests. NEBB will score the exam and notify the applicant of the results.

### Staff Assessment

Staff determined NEBB performs a sufficient evaluation of candidates for prequalification into the ATT certification program in accordance with Section 10-103-B(c)3B(iii). Based upon the minimum years of experience, technician application, and entrance exam, NEBB provides ample evidence to ensure a high level of competency for its certified technicians in mechanical controls and systems. A summary of compliance to Section 10-103-B(c)3B(iii) of the *2013 Building Energy Efficiency Standards* is found in Table 7.

**Table 7: Summary of Application Compliance (Section 10-103-B[c]3B[iii])**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Three Years of Experience and Expertise in Mechanical Controls and Systems	Bylaws of the NEBB, Technician Certification Section, pages 19 and 22	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Description of the Criteria and Review Process	Bylaws of the NEBB, Prequalification Criteria, page 18	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff



# CHAPTER 9: Requirements for Instructor-to-Trainee Ratio

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## Requirement

A sufficient ratio of instructors to participants in classroom and laboratory work shall be maintained to ensure integrity and efficacy of the curriculum and program. The ATTCP shall document in its application to the California Energy Commission why its instructor-to-trainee ratio is sufficient based on industry standards and other relevant information.

## Summary of Compliance Method for Applicant

NEBB defines its maximum examiner to student ratio as 1:35. For hands-on training in the laboratory or shop floor, the training ratio varies according to the complexity of the training but stays within 1:4.

NEBB bases these ratios on years of experience in training and laboratory procedures for understanding of concepts, completion of work, and safe operation of laboratory facilities.

## Staff Assessment

Staff deems the ratios, which NEBB proposes, as acceptable ratios of instructors to participants in classroom and laboratory work to ensure integrity and efficacy of the curriculum and program. A summary of compliance to the *2013 Building Energy Efficiency Standards* (Section 10-103-B[c]3B[iv]) is found in Table 8.

**Table 8: Summary of Application Compliance (Section 10-103-B[c]3B[iv])**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Documentation of Instructor to Trainee Ratio	Bylaws of the NEBB, Technician Certification, page 19	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff



# CHAPTER 10:

## Requirements for Testing

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### Requirement

A written and practical test shall demonstrate each certification applicant's competence in all specified subjects. The ATTCPs shall retain all results of these tests for five years from the date of the test. The applicant must maintain any testing requirements to an exacting standard to ensure relevancy to the subject material, competent testing results, and testing security of not only the test questions, but also the test taking environment.

### Summary of Compliance Method for Applicant

Each ATT candidate must pass the entrance exam, attend and pass a class or webinar, perform a lab project, and a pass a practical (hands-on) exam. The written exam determines if the applicant possesses all of the knowledge relevant to the specific discipline and protocols contained within the acceptance form related to the certification. NEBB's appointed examiners will proctor and administer the exam. The exam is closed book in a secure online format. The intent of the performance exam is to demonstrate the ability to understand the subject matter and proficiently and reliably perform the mechanical acceptance test for which the technician has applied for certification training. NEBB appointed examiners will conduct the performance exam that will replicate field acceptance testing conditions.

NEBB will use the registry for maintaining the result of both written and practical exams for a minimum of seven years. NEBB provided sample tests that are sufficient to demonstrate that the tests ensure relevancy to the subject material.

### Staff Assessment

Staff reviewed the technician certification exam questions submitted by the applicant. Staff considers the exam questions comprehensive with respect to the acceptance testing requirements, the *2013 Building Energy Efficiency Standards*, and the requirements of the applicant's proposed ATTCP program. Staff deemed the exam sufficient to ensure that an ATT receiving a passing score has learned the subject material and has demonstrated sufficient competency to successfully perform mechanical acceptance tests, complete the necessary acceptance test forms, and appropriately submit those forms to the necessary regulating agencies.

Staff is confident NEBB will retain ATT testing results as required, maintain testing requirements to an exacting standard, safeguard the confidentiality of the test questions and the test-taking environment, and maintain competent testing results. A summary of

compliance to Section 10-103-B(c)3B(v) of the *2013 Building Energy Efficiency Standards* found in Table 9.

**Table 9: Summary of Application Compliance (Section 10-103-B[c]3B[v])**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Retention of ATT Testing Results	registry	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff

# CHAPTER 11:

## Requirements for Recertification

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### Requirement

Requirements and procedures for recertification of ATTs must be updated and approved each time the *Building Energy Efficiency Standards* updates with new and/or modified acceptance test requirements. Recertification requirements and procedures shall apply only to specific new and/or modified elements in future updates to the *Building Energy Efficiency Standards*.

### Summary of Compliance Method for Applicant

In its certification manual, NEBB requires renewal of certification for all certification holders (ATTs and ATEs) after the California Energy Commission has revised pertinent sections of the *Building Energy Efficiency Standards* that deal with mechanical acceptance tests. At the time of renewal, each certificate holder must meet all qualifications and requirements for the initial certification. Both ATT and ATE must take and pass the relevant testing to renew their certifications.

### Staff Assessment

Staff finds the recertification procedures submitted for review are substantive and sufficient to adequately comply with the requirements specified in Section 10-103-B(c)3B(vi). A summary of compliance to Section 10-103-B(c)3B(vi) of the *2013 Building Energy Efficiency Standards* is found in Table 10.

**Table 10: Summary of Application Compliance (Section 10-103-B[c]3B][vi])**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Discussion of Recertification Procedures	Bylaws of the NEBB, Recertification Section, page 20	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff



# CHAPTER 12: Requirements for Mechanical Acceptance Test Employer Training

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## Requirement

Training for mechanical acceptance test employers shall consist of a single class or webinar consisting of at least four hours of instruction covering the scope and process of the acceptance tests in the *2013 Building Energy Efficiency Standards* (Section 120.5).

## Summary of Compliance Method for Applicant

The training proposed by NEBB for nonresidential mechanical ATEs consists of a class or webinar consisting of a minimum of four hours of instruction that covers the scope and processes of the acceptance tests in the *2013 Building Energy Efficiency Standards* (Section 120.5).

## Staff Assessment

Staff assessed the proposed training (which is confidential) found it to be over four hours and determined it is adequate to give perspective employers the foundational understanding of the tasks and scope of work to be performed by the ATTs. Staff deemed NEBB’s employer training complies with the requirement. A summary of compliance to the *2013 Building Energy Efficiency Standards* (Section 10-103-B[c]3C) is found in Table 11.

**Table 11: Summary of Application Compliance (Section 10-103-B[c]3C)**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Minimum Employer Training	Bylaws of the NEBB, ATE Certification Section, page 19	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff



# CHAPTER 13:

## Requirements for Complaint Procedures

---

### Requirement

ATTCP shall submit procedures described in writing for notifying building departments and the public that they will accept complaints regarding the performance of any certified ATT or ATE, and procedures for how the ATTCP will address these complaints.

### Summary of Compliance Method for Applicant

NEBB's application provides the detailed procedures for accepting and resolving complaints regarding ATT or ATE actions. Any complaint received by the registry is subject to an evaluation for validity and applicability to the standing of the complainant. The registry will forward a copy of the complaint to NEBB, where a majority of the Title 24 Oversight and Accountability Board and NEBB leadership committee will review. Investigations will be initiated as required to help gather supporting or refuting evidence to enable the most informed decision. Steps to address complaints may include:

- Initial review.
- Administrative hearing.
- NEBB board review
- Possible third-party inspection.
- Resolution hearing.
- NEBB board decision.
- Filing with the registry.

The NEBB board decision may include sanctions and revocation of certification. NEBB will make this process public and available upon approval of its application. The process for addressing complaints will be included in training and outreach materials made available to local building departments.

### Staff Assessment

Staff determined that NEBB's proposed process for addressing complaints is reasonably transparent and fair to both the complainant and the ATT/ATE. The process provides many opportunities for a balanced resolution. Since the process requires quick initial action on the part of the complainant, it is critical that NEBB follow through on its proposal to make the initial submittal process electronically accessible. Therefore, staff determined that the proposed procedures are sufficient to comply with the requirements of Section 10-103-B(c)3D. A summary of compliance to the *2013 Building Energy Efficiency Standards* (Section 10-103-B(c)3D) is found in Table 12.

**Table 12: Summary of Application Compliance (Section 10-103-B[c]3D)**

<b>REQUIREMENT</b>	<b>APPLICATION LOCATION</b>	<b>ADEQUATE</b>	<b>INFORMATION REQUEST</b>
Notification to Building Departments	registry, Bylaws of the NEBB, Annual Audit Section, page 18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Procedures for Accepting Complaints	Bylaws of the NEBB, Complaints Section, page 15	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Procedures for Addressing Complaints	Bylaws of the NEBB, Complaints Section, page 15-17	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff

# CHAPTER 14: Requirements for Certification Revocation Procedures

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## Requirement

ATTCPs must describe procedures in writing for revoking the certification of ATTs and ATEs based upon poor quality or ineffective work, failure to perform acceptance tests, falsification of documents, failure to comply with the documentation requirements of these regulations, or other specified actions that justify decertification.

## Summary of Compliance Method for Applicant

NEBB will apply the procedures for revoking an ATT or ATE certification set forth in the draft *ATTCP Certification Manual* under Section 2.4. The ATTCP may revoke the certification of an ATT or ATE as the result of a NEBB review board decision (see discussion under “Chapter 13: Complaint Procedures”), falsification of the initial or renewal application, or failure to meet eligibility requirements. Under Section 2.5 of the *NEBB ATTCP Certification Manual*, applicants may object to an ATTCP decision as it pertains to certification. The applicant may begin a “general” objection within 10 days of notification if its certification is revoked. The procedures include initial review of the objection, administrative hearing, possible review by the NEBB board, and the board decision.

## Staff Assessment

Staff determined the procedures for revocation of certification are in compliance with the requirements set forth in Section 10-103-B(c)3E. A summary of compliance to Section 10-103-B(c)3E of the *2013 Building Energy Efficiency Standards* is found in Table 13.

**Table 13: Summary of Application Compliance (Section 10-103-B[c]3E)**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Procedures For Revocation of Certification	Bylaws of the NEBB, Actions Section, page 17	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff



# CHAPTER 15: Requirements for Quality Assurance, Independent Oversight, and Accountability

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## Requirement

The ATTCPs shall describe in their applications to the California Energy Commission how their certification business practices include quality assurance, independent oversight, and accountability measures. These measures may include independent oversight of the certification processes and procedures, visits to building sites where certified technicians are completing acceptance tests, certification process evaluations, building department surveys to determine acceptance testing effectiveness, and expert review of the training curricula developed for the *Building Energy Efficiency Standards*, Section 120.5.

## Summary of Compliance Method for Applicant

NEBB will use the online program to perform continuous checks on the efficacy of the forms in process to compare like forms and forms completed by certified technicians. This check includes determining if a technician is possibly “working off the books.” Any abnormalities flagged by the automated system will initiate an investigation conducted by qualified NEBB personnel. Audits will occur on a scheduled and unscheduled basis to ensure consistency. NEBB will select auditors to perform these investigations with the following qualifications:

- A minimum of five years of field experience in controls and systems related to specific acceptance tests.
- Possess an acceptance test technician (ATT) or acceptance test employer (ATE) certification.
- Hold the appropriate NEBB discipline certification.
- Not be in competition with the ATT in the local market area.

If, after due diligence, NEBB cannot identify a professional to perform these investigations who meets these qualifications, these NEBB requirement may be waived in part or in whole. NEBB’s standing Oversight and Accountability Committee reviews any audit findings to make any determinations on disciplinary actions.

If NEBB determines corrective action is required, it reserves the right to resolve the issue up through decertification or suspension of the ATE and/or the ATT. Decertified and/or suspended ATEs and/or ATTs may appeal their certificate status and present information for consideration by the NEBB T24 Oversight and Accountability Committee.

The auditing of ATTs and ATEs shall include the following components:

- All forms submitted to the registry will be analyzed for anomalies (as compared to typical submittals of similar circumstance). When the registry audit reveals abnormal patterns, a notification will be sent to the appropriate NEBB auditor. Any anomalous findings or exact replication of results will be investigated and, in most cases, trigger field verifications and an increased frequency of audits for the involved ATT and ATE.
- Auditors shall review and perform an onsite audit of all forms assigned to them by the T24 Oversight Committee or their agents.
- Field verification and documentation verification shall be implemented where either a complaint was filed or a determination from review of the computerized audit reports triggers further investigation.
- If an ATT or ATE, as determined by audit, has intentionally falsified an acceptance form, NEBB shall revoke its certification.
- If an ATT, as determined by audit, has not displayed the competency required in the proper performance of a specific acceptance test, NEBB reserves the right to suspend the certification until having satisfactorily completed both additional training and recertification, or revoke its certification.

To guarantee ATTs shall not perform acceptance tests nor submit forms for which they are not certified, the registry shall assign exclusive rights to an ATT by form certification.

Moreover, NEBB requires:

- All ATEs and ATTs must use the registry. Failure to do so will result in revocation of certification.
- All ATTs must carry photo identification and their certification card, which lists the acceptance tests in which they are certified.
- Each certification card must possess a unique ID number.

To ensure quality of the training centers, NEBB will select qualified third-party training centers, which may be limited to teaching and testing specific mechanical forms based on the laboratory environment. NEBB will provide sufficient third-party centers to cover the training and testing of all mechanical acceptance forms.

## **Staff Assessment**

After review NEBB's quality assurance methods, independent oversight, and accountability measures, staff concluded NEBB adequately satisfies the requirements in Section 10-103-B(c)3F. Staff visited the training centers to verify existence and quality. NEBB appears committed to maintaining a competent performance level for its representatives. A summary of compliance to Section 10-103-B(c)3F of the *2013 Building Energy Efficiency Standards* is found in Table 14.

**Table 14: Summary of Application Compliance (Section 10-103-B[c]3F)**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Quality Assurance	Bylaws of the NEBB, Actions, page 17; Quality Assurance of the Training Facilities Section, page 20; Annual Audit Section, page 17-18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Independent Oversight	Bylaws of the NEBB, Security and Reliability of the Certification Testing Process Section, page 18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Accountability Measures	Bylaws of the NEBB, Oversight and Accountability, page 20	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff



# **CHAPTER 16:**

## **Requirements for Certification Identification Number and Verification of ATT Certification Status**

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### **Requirement**

Upon certification of an ATT, the ATTCP shall issue a unique certification identification number to the ATT. The ATTCP shall maintain an accurate record of the certification status for all ATTs that it has certified. The ATTCP shall provide verification of current ATT certification status upon request to authorized document registration provider personnel or enforcement agency personnel to determine the ATT's eligibility to sign certificate of acceptance documentation according to all applicable requirements in Section 10-103-B, Section 10-102, Section 10-103(a)4, and *Reference Joint Appendix JA7*.

### **Summary of Compliance Method for Applicant**

NEBB will issue a unique certification number to each certified ATT or ATE. All ATTs must carry photo identification and their wallet-sized certification card when performing acceptance testing. All ATEs and ATTs must use and be listed in the registry. The registry will be a repository for all information concerning the NEBB ATTCP, including the status of all certified ATTs and ATEs.

ATT status is limited to three possibilities: certification is current, certification is suspended or under review, or certification is revoked. Only ATTs with a “current” status may perform work. The registry will also show the pertinent contact information about the ATTs and ATEs and will include which ATEs employ each ATT.

Certified ATTs must use the registry to enter in project information to complete the specified acceptance test. The registry will only allow a technician to complete the acceptance tests for which they are certified. Once completed, an ATT can download from the registry or print the acceptance form onto any local printer. The printed form is complete, ready to sign, and bears the NEBB logo to prove authenticity.

### **Staff Assessment**

Staff is confident that NEBB intends to issue each ATT (or ATE) a unique certification number and will keep the status of all certified ATTs and ATEs update in the registry. While staff believes the database with Web access will satisfy the requirements in Section 10-103-B(c)3G, the mechanical registry has not shown to be ready to launch. Therefore, staff recommends as a condition of approval, that NEBB launch and make available for examination (by staff) the proposed registry.

To meet the requirement completely and to alleviate potential confusion in the market, it is imperative that the registry be operational with the minimum abilities listed:

- List the contact information and current certification status of all approved ATTs and ATEs.
- Act as the complaint portal for local building departments, other permitting agents, and the public.
- Provide analytical reports for quality assurance and other purposes.
- Provide information as requested to appropriate local enforcement agencies and Energy Commission staff.
- Limit ATT access to only acceptance test forms for which they hold valid and current certification.
- Provide complete acceptance test forms with an appropriate NEBB logo hard copy for submission to a local enforcement agency.

Building owners will need to know which forms need completing and which ATEs/ATTs to hire. Projects may require referencing multiple websites and contracting multiple technicians to secure the appropriately certified technicians.

A summary of compliance to Section 10-103-B(c)3G of the *2013 Building Energy Efficiency Standards* is found in Table 15.

**Table 15: Summary of Application Compliance (Section 10-103-B[c]3G)**

REQUIREMENT	APPLICATION LOCATION	ADEQUATE	INFORMATION REQUEST
Issue Certification ID	Bylaws of the NEBB, Oversight and Accountability, page 20	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Maintain Records of Certified ATTs	registry	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Provide Verification of Current ATTs Status	registry	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Source: Energy Commission staff

# CHAPTER 17:

## Staff Recommendations

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Staff completed its evaluation of the NEBB application pursuant to Title 24, Part 1, Chapter 10, Section 10-103-B(f) of the *2013 Building Energy Efficiency Standards*, which was submitted on June 16, 2014. Staff has determined that NEBB's application complies with the requirements of Title 24, Part 1, Chapter 10, Section 10-103-B(c) with the exception of demonstrating the immediate operation of the Web-based registry and the hands-on training program.

Staff determines that NEBB's application complies with the requirements of Title 24, Part 1, Chapter 10, Section 10-103-B(c) with the following conditions:

- **COA-1:** By *Date TBD*,<sup>11</sup> NEBB (or their representatives) must have implemented an online web service with the capability to:
  - Limit Acceptance Test Technician access to only acceptance test forms for which they hold valid and current certification.
  - Provide a method to complete acceptance test forms bearing an appropriate NEBB-logo and print a hardcopy for submission to local building authorities.
  - Make available contact information and current certificate status of all approved Acceptance Test Employers and Technicians.
  - Web directory must be able to sort (or filter) by name, county, and by each Acceptance Test for which the Acceptance Test Technician has current certification.
  - File complaints to NEBB regarding any Acceptance Test Technician or Employer from local enforcement agencies, other permitting agents, and/or the public.
  - Provide monthly (or as requested) analytical reports for quality assurance and other purposes to California Energy Commission staff and local enforcement agencies.
  - Provide information as requested to appropriate local enforcement agencies and Energy Commission staff.

### **Compliance:**

NEBB will demonstrate that the registry is in full operation by allowing Energy Commission staff to enter test data including:

- Registering as a fictitious ATT and ATE.
- Registering as a fictitious builder and submit acceptance test jobs for bid.
- Filing completed fictitious acceptance test forms.
- Producing printed versions of fictitious acceptance test forms.
- Submit "suspicious" acceptance test forms that should be caught by the system.
- File a complaint against one of the fictitious ATTs entered by staff.
- Produce an analytic report from the system showing all activities of the fictitious ATT and ATE entered by staff.

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<sup>11</sup> Approximately 90 days after the Energy Commission has formally approved NEBB's application.

NEBB will also produce an annual report as prescribed in Title 24, Part 1, Chapter 10, Section 10-103-B(d). The annual report, at a minimum, will include a list of all ATTs and ATEs separately, and the total number of acceptance test forms filed for each type of acceptance test by California county.

Once Energy Commission staff is satisfied with the performance of the registry, staff will provide NEBB with a written acknowledgement of compliance.

- **COA-2:** By *Date TBD*,<sup>12</sup> NEBB must demonstrate access to enough laboratories with the combined capability, if more than one, to perform all necessary mechanical systems acceptance tests required in the *2013 Building Energy Efficiency Standards*, Section 120.5 in an instructional setting.

**Compliance:**

NEBB will provide Energy Commission staff a copy of a memorandum of understanding signed by NEBB representatives and each facility owner/operator that include the following minimum information:

- The owners/operators of the facilities.
- The addresses of the facilities.
- The acceptance tests to be performed at each facility.
- The signatory parties.
- The signatory date(s).

Energy Commission staff will be granted physical access to each facility to ensure that the facilities are real and capable of providing a laboratory training environment.

Once Energy Commission staff is satisfied that the records submitted by NEBB, staff will provide NEBB with a written acknowledgement of compliance.

- **COA-3:** *Date TBD*,<sup>13</sup> NEBB must assign a representative to verify that these laboratories in total, if more than one, can complete all acceptance tests procedures as provided by the NEBB acceptance test technician certification provider application.

**Compliance:**

NEBB representative must submit a signed and dated affidavit stating the following for each training facility identified in **COA-2**:

- A NEBB representative(s) has visited the facility in person.
- A NEBB representative(s) has reviewed and has knowledge of NEBB's Acceptance Test laboratory procedures relevant to the facility.
- A NEBB representative(s) will vouch that the laboratory is capable of being used for the educational purposes intended by NEBB for acceptance test education and testing.

Once Energy Commission staff is satisfied that the records submitted by NEBB, staff will provide NEBB with a written acknowledgement of compliance.

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12 Ibid.

13 Ibid.

- **COA-4:** NEBB must notify the Energy Commission within 10 business days of any loss of access to any laboratory facility for which a signed memorandum of understanding that allowed NEBB to perform mechanical systems acceptance tests required by the 2013 Building Energy Efficiency Standards, Section 120.5 in an instructional setting. Within 90 days of notification, NEBB must identify sufficient replacement facility.

**Compliance:**

NEBB will provide Energy Commission staff a copy of a memorandum of understanding signed by NEBB representatives and each replacement facility owner/operator that include the following minimum information:

- The owners/operators of the facilities.
- The addresses of the facilities.
- The acceptance tests to be performed at each facility.
- The signatory parties.
- The signatory date(s).

Energy Commission staff will be granted physical access to the replacement facility to ensure that the facility is real and capable of providing the required laboratory training environment.

A NEBB representative must submit a signed and dated affidavit stating the following for each replacement training facility identified:

- A NEBB representative(s) has visited the facility in person.
- A NEBB representative(s) has reviewed and has knowledge of NEBB's Acceptance Test laboratory procedures relevant to the facility.
- A NEBB representative(s) will vouch that the facility is currently capable of being used for the educational purposes intended by NEBB for acceptance test education and testing.

Once Energy Commission staff is satisfied that the records submitted by NEBB, staff will provide NEBB with a written acknowledgement of compliance.

Staff believes NEBB intends to fulfill these conditions in good faith. The provided deadlines, which are 90 days after approval, will allow timely resolution of the conditions and not place any unreasonable burden on NEBB to comply. Staff recommends approval of the NEBB application with these four conditions of approval.

# Glossary

ATTCP

Acceptance Test Technician Certification Provider

An agency, organization or entity approved by the Energy Commission to train and certify acceptance test technicians and acceptance test employers.

ATT

Acceptance Test Technician

A Field Technician who is certified by an authorized acceptance test technician certification provider.

ATE

Acceptance Test Employer

A person or entity who employs an acceptance test technician and is certified by an authorized acceptance test technician certification provider.

DCV

Demand Control Ventilation

Demand Controlled ventilation refers to an HVAC system's ability to reduce outdoor air ventilation flow below design values when the space served is at less than design occupancy.

DxAC

Direct Expansion Air Conditioning

A standard HVAC system prevalent in commercial use where the refrigerant is compressed in a compressor and then cooled in an air-cooled condenser and delivered to the building via ducting.

ESCO Group, Inc.

A national training and development organization based in Colorado.

EIN

Employer Identification Number

An EIN, also known as a Federal Tax Identification Number, is used to identify a business entity.

FDD

Fault Detection and Diagnostics

Automated FDD systems ensure proper HVAC equipment operation by identifying and diagnosing common equipment problems such as temperature sensor faults, low airflow, or faulty economizer operation.

HVAC	A common term used in the heating and cooling industry. It stands for the three functions often combined into one system in today's modern homes and nonresidential buildings.
Heating, Ventilation and Air Conditioning	
MOU	A formal agreement between two or more parties.
Memoranda of Understanding	
NEBB	A national, nonprofit professional organization for heating, ventilation and air conditioning professional contractors.
National Environmental Balancing Bureau, Inc.	
PDF	A file format introduced to ease the sharing of documents between computers and across operating system platforms to save files that cannot be modified but still need to be easily shared and printed.
Portable Document Format	
PPT	The file extension for Microsoft® PowerPoint files.
Power Point	
TES	A commercial HVAC system that reduces energy consumption during peak demand periods by shifting energy consumption to nighttime by creating and storing cooled fluid or ice in tanks.
Thermal Energy Storage	