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STAFF REPORT

Mechanical Acceptance Test Technician Certification Provider 2016 Update Review: National Environmental Balancing Bureau

*Compliance Review for the 2016 California Building Energy
Efficiency Standards*

California Energy Commission
Edmund G. Brown Jr., Governor



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ABSTRACT

Per the requirements in Section 10-103.2(d) of the *2016 Building Energy Efficiency Standards*, mechanical Acceptance Test Technician Certification Providers must report to the California Energy Commission adjustments that have been made to the training curricula to address adopted updates to the *Building Energy Efficiency Standards*. The Energy Commission adopted the *2016 Building Energy Efficiency Standards* on November 12, 2015, and they went into effect on January 1, 2017. Energy Commission staff notified the National Environmental Balancing Bureau on February 12, 2016, that it must develop a report on adjustments it will make to its training curricula and application to address new and modified requirements in the *2016 Building Energy Efficiency Standards*. The National Environmental Balancing Bureau submitted its update report on July 6, 2016, and an amendment to the update report on April 23, 2018. On March 25, 2018, staff determined that National Environmental Balancing Bureau's amended 2016 update report was complete.

Staff evaluated the training curricula adjustments and other application amendments submitted by the National Environmental Balancing Bureau submitted in its amended 2016 update report. Staff determined the proposed training updates and other application amendments the National Environmental Balancing Bureau submitted meet the requirements of Section 10-103.2(c) of the *2016 Energy Standards*. Staff recommends approval of the National Environmental Balancing Bureau's 2016 training curricula adjustments and other application amendments.

Keywords: Nonresidential mechanical Acceptance Test Technician Certification Provider, National Environmental Balancing Bureau, mechanical systems, acceptance testing, Building Energy Efficiency Standards.

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EXECUTIVE SUMMARY

The mechanical Acceptance Test Technician Certification Provider program provides training, certification, and oversight of technicians who perform acceptance tests required by the California's *Building Energy Efficiency Standards*, as well as employers. Providers are professional organizations approved to provide the training curricula, as well as certification procedures, complaint resolution (including disciplinary procedures), quality assurance, and accountability measures to technicians and their employers. Acceptance testing ensures that installed equipment, controls, and systems in nonresidential buildings operate as required by the *Building Energy Efficiency Standards*.

Per Section 10-103.2(d) of the *2016 Building Energy Efficiency Standards*, providers are required to report to the California Energy Commission adjustments that have been made to training curricula to address changes to acceptance testing requirements or to adopted updates to the *Building Energy Efficiency Standards*. This update report must be submitted no less than six months before the effective date of any newly adopted *Building Energy Efficiency Standards*. All reports shall contain a signed certification that all requirements have been met.

Providers must also demonstrate to the Energy Commission that their acceptance testing certification services will comply with any applicable updates if their previously approved application does not comply with new or modified requirements. The training curricula adjustments and any other application amendments shall be reviewed by the Energy Commission according to criteria in Section 10-103.2(f) to determine if providers have satisfied the requirements under the *Building Energy Efficiency Standards*. The Energy Commission adopted the *2016 Building Energy Efficiency Standards* on November 12, 2015, and they went into effect on January 1, 2017.

The Energy Commission approved the National Environmental Balancing Bureau as a nonresidential mechanical acceptance test technician certification provider on January 13, 2016. On February 12, 2016, Energy Commission staff notified the National Environmental Balancing Bureau that it must develop a 2016 update report detailing adjustments it will make to its training curricula and application to address new and modified requirements in the *2016 Building Energy Efficiency Standards*. The National Environmental Balancing Bureau submitted its 2016 update report to the Energy Commission for review within the six months allowed by regulation (July 6, 2016). Staff found that the quality assurance program proposed by the National Environmental Balancing Bureau was not compliant with the *2016 Building Energy Efficiency Standards*. The National Environmental Balancing Bureau submitted amended versions to its 2016 update report on December 12, 2016, and April 23, 2018. In its final update report, the National Environmental Balancing Bureau described its intent to meet the quality

assurance requirements under the proposed *2019 Building Energy Efficiency Standards* in place of requirements for the *2016 Building Energy Efficiency Standards*.

Energy Commission staff reviewed the National Environmental Balancing Bureau amended 2016 update report and found that the quality assurance program meets the quality assurance requirements of the proposed *2019 Building Energy Efficiency Standards* and that the training curriculum adjustments and other application amendments meet the requirements of Section 10-103.2(c)3 of the *2016 Building Energy Efficiency Standards*.

CHAPTER 1: Background

The Mechanical Acceptance Test Technician Certification Provider Program

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 *Building Energy Efficiency Standards* (Energy Standards), as well as Acceptance Test Employers (ATEs). ATTCPs are professional organizations approved by the California Energy Commission to provide training curricula for ATTs and their ATEs. They also provide 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 Energy Standards. The ATTCP program was developed to improve compliance with lighting controls and mechanical acceptance test requirements.

Requirements for 2016 Update Report

In accordance with Section 10-103.2(d) of the 2016 Energy Standards (codified in Title 24, Part 6, of the California Code of Regulations), mechanical ATTCPs are required to report to the Energy Commission adjustments that have been made to the training curricula to address changes to mechanical system acceptance testing requirements or any adopted updates to the Energy Standards. The reports must be submitted no less than six months prior to the effective date of any newly adopted Energy Standards and shall contain a signed certification that the mechanical ATTCP meets all requirements for this program. Mechanical ATTCPs must also demonstrate to the Energy Commission that their acceptance testing certification services will comply with any applicable updates to the Energy Standards if their approved 2013 application does not comply with the requirements for mechanical ATTCPs in the 2016 Energy Standards.

Update reports submitted by mechanical ATTCPs are considered application amendments. According to Section 10-103.2(f) of the 2016 Energy Standards, "Amendments that contain any substantive changes shall be subject to the application review and determination process specified in Section 10-103.2(e)." As such, staff will evaluate the training curricula adjustments and other application amendments contained within 2016 update reports to determine if a mechanical ATTCP's training, certification, and oversight services comply with the criteria and procedures set forth in Section 10-103.2(c)3 of the 2016 Energy Standards.

Issues Regarding the 2016 Quality Assurance Requirements

The 2016 Energy Standards modified the requirement for mechanical ATTCPs to perform on-site quality assurance inspections by making them mandatory. While the minimum level for paper audits was already being met (if not exceeded), the mechanical ATTCPs indicated they would be unable to meet the minimum level of on-site acceptance test samples required. As a result, Energy Commission staff entered into discussions with the mechanical ATTCPs regarding a revision to the quality assurance regulations in Section 10-103.2(c)3F for mechanical ATTCPs and proposed changes for the 2019 Energy Standards.¹ The proposed 2019 Energy Standards addressed issues raised by the mechanical ATTCPs by allowing quality assurance inspectors to enter an active construction site and follow ATTs as they perform the acceptance test in real time (referred to as shadow-auditing). Furthermore, it requires an on-site inspection rate equal to that required by the 2016 Energy Standards. The mechanical ATTCPs agreed that the quality assurance requirements in Section 10-103.2(c)3F of the proposed 2019 Energy Standards are implementable. Therefore, staff will recommend that the Energy Commission approve mechanical ATTCP quality assurance programs that meet the requirements in Section 10-103.2(c)3F of the proposed 2019 Energy Standards viewing them as equivalent to complying with Section 10-103.2(c)3F of the 2016 Energy Standards.

National Environmental Balancing Bureau

The Energy Commission adopted the 2016 Energy Standards on November 12, 2015, and they went into effect on January 1, 2017. Energy Commission staff notified the National Environment (NEBB) on February 12, 2016 that it must develop a 2016 update report detailing the adjustments it would make to its training curricula and application to address the new and modified requirements in the 2016 Energy Standards.

NEBB submitted its 2016 update report to the Energy Commission for review within the six months allowed by regulation (July 6, 2016). However, concerns were raised about the quality assurance program proposed by NEBB, and the Energy Commission found the program noncompliant. NEBB submitted an amended 2016 update report on December 6, 2016, however, it did not adequately address the quality assurance concerns. Following quality assurance discussions on the 2019 Energy Standards and taking into account the solution proposed to allow mechanical ATTCPs to comply with the 2019 quality assurance requirements for the 2016 code cycle, NEBB submitted an amended 2016 update report on April 23, 2018.

Energy Commission staff determined that NEBB's 2016 update report was complete on April 25, 2018. Staff reviewed NEBB's 2016 update report according to the review and determination process specified in Section 10-103.2(e) of the 2016 Energy Standards.

¹ See Appendix B: Excerpt of the Quality Assurance Requirements for the 2019 Energy Standards.

Staff found that NEBB's proposed quality assurance measures comply with Section 10-103.2(c)3F of the proposed 2019 Energy Standards and the rest of NEBB's application amendments proposed in its 2016 update report comply with the requirements in Section 10-103.2(c) of the 2016 Energy Standards.

CHAPTER 2: Mechanical ATTCP 2016 Update Report Evaluation

Staff identified the changes from 2013 to 2016 for mechanical systems acceptance testing to help ease the mechanical ATTCPs' transition to the 2016 Energy Standards. Staff identified two main categories of regulatory changes as defined by Section 10-103.2(f)1: substantive and nonsubstantive changes.

The first section of this chapter discusses the regulatory changes that staff deemed to be substantive based on the associated effect on mechanical ATTCPs at the organizational level: the modified quality assurance requirements in Section 10-103.2(c)3F of the 2016 Energy Standards. The second section of this chapter discusses changes that staff deemed to be nonsubstantive because they do not significantly alter the requirements of the application materials for the mechanical ATTCPs, ATTs, or ATEs.

Substantive Regulatory Changes

Quality Assurance - Title 24, Part 1, Section 10-103.2(c)3F

The mechanical ATTCP shall describe in its application to the Energy Commission how its certification business practices include quality assurance and accountability measures including, but not limited to, 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 Energy Standards.

The mechanical ATTCP shall review a random sample of no fewer than 1 percent of each technician's completed compliance forms (desk audit). The mechanical ATTCP shall also perform randomly selected onsite shadow audits of no less than 1 percent of each employer's overseen projects by following the assigned technician tasked with observing the performance on the job site (onsite audit).

Independent oversight may be demonstrated by accreditation under the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC) 17024 standard.

Summary of Compliance Method for Mechanical ATTCP

Compliance With the Desk Audit Requirement

In an agreement with the ESCO Group, NEBB will implement quality assurance measures for the percentage of on-site audits to satisfy the requirement for random sampling of each technician's completed acceptance tests (no less than 1 percent of each ATT's completed compliance documents and no less than 1 percent of each ATT's completed acceptance tests. Each ATT will also be subject to a random audit rate of 5 percent of its completed mechanical acceptance tests or five compliance documents, whichever is greater).

NEBB requires all of its certified ATEs to enter and submit all completed acceptance compliance documents into the ESCO Group nonresidential mechanical data registry. The registry uses algorithms within each compliance document to check 100 percent of submitted compliance documents for inaccuracies and anomalies. Any anomalous findings or exact replication of results are examined and, in most cases, will initiate field verification and more frequent audits of the involved personnel. Notifications will be sent to NEBB if any compliance documents are identified as atypical.

If an audit reveals suspicious activity that requires more than a desk audit, auditors reserve the right to follow up with a site visit to investigate the deficiencies. Auditors employed by the ESCO Group must have a minimum of five years of field experience working on the specific compliance documents that they are assigned to audit.

Compliance With the On-Site Audit Requirement

NEBB has contracted with the ESCO Group to provide independent, third-party onsite audit services. The ESCO Group will perform onsite audits of no fewer than 1 percent of each ATE's calendar year projects. Whenever feasible, onsite audits will be performed across multiple projects at various building-sites and include ATTs employed by the ATE. Onsite audits will be performed on or before each ATE's fiftieth project within a calendar year.

The independent quality assurance provider (IQAP) will submit a report to the Energy Commission no later than January 31 of each year listing ATEs who did not receive an onsite audit during the previous calendar year. The IQAP will make a good faith effort to audit all ATEs listed in the annual unaudited ATE report on a priority basis (as early in the calendar year as possible).

The IQAP will perform onsite audits using the "job shadow" method, and they will be conducted by trained and credentialed quality assurance inspectors (QAI).

The mechanical ATTCP will record and make available to the Energy Commission all remedial actions resulting from an audit. This record will include, but shall not be limited to remediation and/or discipline actions such as retraining, suspension, or

revocation of an ATE's or ATT's certification.

Notification of Audit Results

Based on the audit results, the mechanical ATTCP shall notify the ATE and the ATT by email of what, if any, remedial actions are required.

The mechanical ATTCP will take the following actions upon receipt of a quality assurance report from the IQAP.

- Minor infraction: warning issued (ATE and ATT)
- First failure: targeted retraining and retesting (ATE or ATT)
- Second failure: decertification (ATE or ATT) with the option to restore certification with the successful completion of the full training and testing requirements.

The mechanical ATTCP will maintain a record of all remedial actions for any ATE or ATT for no less than five years and will submit a descriptive report of all quality assurance activities annually (and periodically by request) to the Energy Commission. That will be done with the assistance of the ESCO Group.

Staff Assessment

Staff reviewed NEBB's amended application regarding the proposed quality assurance program. The proposed program includes 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 Energy Standards. NEBB will electronically review all completed compliance forms submitted by ATTs and will perform randomly selected on-site audits of no less than 1 percent of each ATE's overseen projects. Staff determined that NEBB's proposed quality assurance program complies with the requirements in Section 10-103.2(c)3F of the proposed 2019 Energy Standards.²

Nonsubstantive Regulatory Changes

Minor Changes to Title 24, Part 6

The updates in Part 6 of the 2016 Energy Standards are considered nonsubstantive because they do not require a mechanical ATTCP to substantively alter its approved application. While any change to mechanical systems acceptance testing requirements will require mechanical ATTCPs to adjust their training curricula, the nonsubstance updates do not require substantive training adjustments – such as entirely new

² See Attachment B: Excerpt of the Quality Assurance Requirements for the 2019 Energy Standards.

laboratory components or lectures. Instead, the nonsubstance 2016 updates build upon requirements in the 2013 Energy Standards. Therefore, the mechanical ATTCP must simply demonstrate its training includes the nonsubstance updates to comply with the ATT curricula requirements in Section 10-103.2(c)3B(i) and the ATE training requirements in Section 10-103.2(c)3C.

In compliance with the 2016 Energy Standards, the mechanical ATTCP must demonstrate that its recertification training includes the nonsubstance updates. The recertification requirements for minor updates do not include tests or hands-on training, though staff encourages mechanical ATTCPs to incorporate those elements where appropriate and possible.

Summary of Compliance Method for Mechanical ATTCP

NEBB developed a webinar that each certified ATT and ATE must attend to recertify. The training for ATTs and ATEs is relatively unchanged from the 2013 Energy Standards. The webinar would familiarize ATTs and ATEs with changes to the 2016 Energy Standards and, in particular, any changes to the *Nonresidential Compliance Manual* and the mandated mechanical acceptance tests. All ATTs and ATEs will have to complete their respective 2016 recertification statements, which serve as a signed affidavit stating that they have attended the webinar and that their respective qualifications have not changed. If the ATTs and ATEs fail to do so, it will result in decertification. All test materials for this training is confidential, therefore, staff's evaluation of its compliance is available only in this public document.

Staff Assessment

Staff evaluated NEBB's recertification materials for the 2016 Energy Standards. Staff has determined that NEBB's 2016 recertification training satisfies the requirements in Section 10-103.2(c)3B(i) of the 2016 Energy Standards for ATTs and in Section 10-103.2(c)3C of the 2016 Energy Standards for ATEs. Staff has also determined that NEBB's 2016 recertification training satisfies the requirements in Section 10-103.2(c)3B(vi) of the 2016 Energy Standards for recertification. A summary of NEBB's compliance with Sections 10-103.2(c)3B(i), 10-103.2(c)3B(ii), and 10-103.2(c)3C of the 2016 Energy Standards are provided in Table 1.

Table 1: Summary of Mechanical ATTCP Compliance With Minor Title 24, Part 6 2016 Updates

SECTION	UPDATE	mechanical ATTCP APPLICATION AMENDMENT LOCATION(S)	ADEQUATE
110.2	Updates to Tables 110.2-A through 110.2-K to align them with minimum efficiency requirements in ASHRAE 90.1	PDF Filename: 2016 T-MCH-XX – 2016-10-26_Added slides.pdf, Page 1. (“XX” indicates the modules MCH-02 through MCH-18)	☒
120.2(i)	Corrects “greater than or equal to” to “greater than” for consistency with ASHRAE 90.1	PDF Filename: 20160701T144235_2016_Employer_Training_Module.PDF Slide 109	☒
120.2(j)	Adds section specifying digital direct controls (DDC) applications and qualifications	PDF Filename: 2016 T-MCH-XX – 2016-10-26_Added slides.pdf, Page 2. (“XX” indicates the modules MCH-02 through MCH-18)	☒
120.2(k)	Revises the requirements for space conditioning systems with DDC to the zone level	PDF Filename: 2016 T-MCH-XX – 2016-10-26_Added slides.pdf, Page 2. (“XX” indicates the modules MCH-02 through MCH-18)	☒
140.4(n)	Adds control requirements when interlocks for doors and windows are present	PDF Filename: 2016 T-MCH-XX – 2016-10-26_Added slides.pdf, Page 1. (“XX” indicates the modules MCH-02 through MCH-18)	☒
NA7.5.11.2.4	Removes functional testing for refrigerant diagnostic sensors	PDF Filename: 20160701T145501_2016_TMCH12.PDF Page 19.	☒

Source: California Energy Commission

CHAPTER 3: Staff Recommendations

Under Section 10-103.2(f)2 of the 2016 Energy Standards, staff completed its evaluation of the application amendments NEBB reported in its amended 2016 update report. Staff determined that the substantive adjustment to NEBB's quality assurance program meets the requirements in Section 10-103.2(c)3F of the proposed 2019 Energy Standards. Staff further determined that the nonsubstantive adjustments to NEBB's training requirements meet the requirements in Section 10-103.2(c) of the 2016 Energy Standards.

Staff recommends that the Energy Commission approve the NEBB quality assurance program as meeting the proposed 2019 Energy Standards requirements in place of the 2016 Energy Standards requirements. Staff further recommends that NEBB's update report be approved to add the 2016 Energy Standards to its existing mechanical ATTCP certification services.

APPENDIX A:

Glossary

ASHRAE American Society of Heating, Refrigeration, and Air Conditioning Engineers	Founded in 1894, ASHRAE is a global society focused on building systems, energy efficiency, indoor air quality, refrigeration and sustainability. It serves as a source of technical standards and guidelines.
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 certified by an authorized acceptance test technician certification provider.
ATE Acceptance test employer	A person, or entity, that employs an acceptance test technician and is certified by an authorized acceptance test technician certification provider.
DDC Digital direct controls	Automated control of a condition or process by a digital device (computer). DDC is often used to control HVAC devices such as valves using microprocessors and software to perform the control logic.
Energy Standards Building Energy Efficiency Standards	State regulations contained in Title 24, Parts 1 and 6 of the California Code of Regulations.
NEBB National Environmental Balancing Bureau	A professional organization representing balance technicians and HVAC contractors.

APPENDIX B:

Excerpt of the Quality Assurance Requirements for the 2019 Energy Standards

EXCERPT FROM PROPOSED 2019 BUILDING ENERGY EFFICIENCY STANDARDS

Title 24, Part 1, Section 10-103.2(c)3F

F. Quality Assurance and Accountability. The ATTCP shall describe in its applications to the Energy Commission procedures for conducting quality assurance and accountability activities, including but not limited to the following:

- (i) The ATTCPs shall ~~describe in their applications to the Energy Commission how their certification business practices~~ include quality assurance and accountability measures, including but not limited to independent oversight of the certification materials, 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 Building Energy Efficiency Standards, Section 120.5.
- (ii) The ATTCP shall review a random sample of no less than 1 percent of each ~~Technician's ATT's completed compliance forms, and shall perform randomly selected on-site audits of no less than 1 percent of each Technician's completed acceptance tests.~~ The ATTCP shall also randomly select and shadow audit no less than 1 percent of each ATE's overseen projects, following the assigned ATT and observing their performance on the job site. Independent oversight may be demonstrated by accreditation under the ISO/IEC 17024 standard.