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STAFF REPORT

Mechanical Acceptance Test Technician Certification Provider 2016 Updates Review: California State Pipe Trades Council

Compliance Review to 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*, acceptance test technician certification providers must report to the California Energy Commission (Energy Commission) what adjustments have been made to the training curricula, if any, to address adopted updates to the Energy Standards. The Energy Commission adopted the *2016 Building Energy Efficiency Standards* on November 12, 2015, which went into effect on January 1, 2017. Energy Commission staff notified the California State Pipe Trades Council on February 12, 2016 that it must develop a report of the adjustments that it will make to its training curricula and application to address the new and modified requirements in the *2016 Building Energy Efficiency Standards*. California State Pipe Trades Council submitted its update report on January 10, 2017 and an amendment to the update report on March 7, 2018. Staff determined that California State Pipe Trades Council's amended 2016 update report was complete on March 12, 2018. Staff evaluated the training curricula adjustments and other application amendments that the California State Pipe Trades Council submitted in its amended 2016 update report. With the exception of the quality assurance program, staff determined the proposed training updates and other application amendments the California State Pipe Trades Council submitted meet the requirements of Section 10-103.2(c) of the *2016 Building Energy Efficiency Standards*. Staff found that the California State Pipe Trades Council's quality assurance program complies with the requirements in Section 10-103.2(c)3F of the proposed *2019 Building Energy Efficiency Standards*, which are equally as stringent as the *2016 Building Energy Efficiency Standards*. Staff recommends that the Energy Commission approve the quality assurance program compliance with Section 10-103.2(c)3F of the proposed *2019 Building Energy Efficiency Standards* in place of compliance with the *2016 Building Energy Efficiency Standards*. Staff recommends approval of the California State Pipe Trades Council's 2016 training curricula adjustments and other application amendments.

Keywords: Nonresidential Mechanical Acceptance Test Technician Certification Provider, California State Pipe Trades Council, Mechanical Systems, Acceptance Testing, Building Energy Efficiency Standards.

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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's *Building Energy Efficiency Standards*, as well as the acceptance test employers that employ technicians. Providers are professional organizations that are approved to provide the training curricula 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 *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 what adjustments have been made to training curricula to address changes to acceptance testing requirements or adopted updates to the *Building Energy Efficiency Standards*. This update report should be submitted no less than six months prior to 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 the new or modified requirements. The training curricula adjustments and any other application amendments shall be reviewed by the Energy Commission according to the criteria in Section 10-103.2(f), to determine if providers satisfy the requirements under the *Building Energy Efficiency Standards*. The Energy Commission adopted the *2016 Building Energy Efficiency Standards* on November 12, 2015, which went into effect on January 1, 2017.

The Energy Commission approved the California State Pipe Trades Council as a nonresidential mechanical acceptance test technician certification provider on August 10, 2016. Energy Commission staff notified the California State Pipe Trades Council on February 12, 2016 that it must develop a 2016 update report with the adjustments that it will make to its training curricula and application to address the new and modified requirements in the *2016 Building Energy Efficiency Standards*. The California State Pipe Trades Council submitted its 2016 update report to the Energy Commission for review on January 10, 2017, and submitted an amended version on March 7, 2018.

Staff determined that California State Pipe Trades Council's amended 2016 update report was complete on March 12, 2018. Staff evaluated the training curricula adjustments and other application amendments that the California State Pipe Trades

Council submitted in its amended 2016 update report. With the exception of the quality assurance program, staff determined the proposed training updates and other application amendments the California State Pipe Trades Council submitted meet the requirements of Section 10-103.2(c) of the *2016 Building Energy Efficiency Standards*. Staff found that the California State Pipe Trades Council's quality assurance program complies with the requirements in Section 10-103.2(c)3F of the proposed *2019 Building Energy Efficiency Standards*, which are equally as stringent as the *2016 Building Energy Efficiency Standards*. Staff recommends that the Energy Commission approve the quality assurance program compliance with Section 10-103.2(c)3F of the proposed *2019 Building Energy Efficiency Standards* in place of compliance with the *2016 Building Energy Efficiency Standards*. Staff recommends approval of the California State Pipe Trades Council's 2016 training curricula adjustments and other application amendments.

CHAPTER 1: Background

The 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 the acceptance test employers (ATEs) that employ ATTs. ATTCPs are professional organizations that are approved by the California Energy Commission to provide training curricula for ATTs and ATEs, 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 what adjustments have been made to the training curricula to address changes to mechanical system acceptance testing requirements or 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 ATTCP met all requirements for this program. 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 ATTCPs in the 2016 Energy Standards.

Update reports submitted by mechanical ATTCPs are considered application amendments. According to Section 10-103.2(f)2 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 an 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.

Quality Assurance Requirements for the 2016 Code Cycle

The 2016 Energy Standards added a quality assurance requirement for ATTCPs to review a minimum sample size of completed acceptance forms and tests to ensure consistent compliance. Additionally, the 2016 Energy Standards required on-site visits as mandatory as opposed to merely being recommended in the 2013 Energy Standards.

Following the adoption of the 2016 Energy Standards, the ATTCPs of record were tasked with providing a quality assurance plan that presented several logistic problems that were not considered during the 2016 Energy Standards rulemaking. As a result, these logistical problems prevented the ATTCPs from designing a quality insurance plan that would be considered by staff to be in compliance with Section 10-103.2(c)3F of the 2016 Energy Standards. The central issue was the means by which an inspector would gain access to a completed project site to test and verify the relevant mechanical installations on-site. The resolution proposed in the 2019 Energy Standards allows for the inspector to enter onto an active construction site to observe an ATT as they are performing the acceptance testing on the mechanical installations.¹ This compromise allows for a logistically implementable quality assurance program for the ATTCP and an on-site inspection rate equal to that required by the 2016 Energy Standards. Therefore, staff will recommend that the Energy Commission approve ATTCP quality assurance programs that are in compliance with the proposed Section 10-103.2(c)3F of the 2019 Energy Standards.

California State Pipe Trades Council

The Energy Commission adopted the 2016 Energy Standards on November 12, 2015, which went into effect on January 1, 2017. Energy Commission staff notified California State Pipe Trades Council (CSPTC) on February 12, 2016 that it must develop a 2016 update report with the adjustments that it would make to its training curricula and application to address the new and modified requirements in the 2016 Energy Standards. CSPTC submitted its 2016 update report to the Energy Commission for review on January 10, 2017. However, concerns regarding the quality assurance program initially proposed by CSPTC

1 See Appendix A for an excerpt of the quality assurance requirements for the 2019 Energy Standards.

were raised and the program was found to be noncompliant. Following quality assurance discussions for the 2019 Energy Standards and the decision that mechanical ATTCPs would be permitted to comply with the 2019 quality assurance requirements for the 2016 code cycle, CSPTC submitted an amended 2016 update report on March 7, 2018.

Energy Commission staff determined that CSPTC's 2016 update report was complete on March 12, 2018. Staff reviewed CSPTC's 2016 update report according to the review and determination process specified in Section 10-103.2(e) of the 2016 Energy Standards. Staff found that CSPTC's proposed quality assurance measures comply with Section 10-103.2(c)3F of the 2019 Energy Standards and the rest of CSPTC's application amendments proposed in its 2016 update report comply with the requirements in Section 10-103.2(c) of the 2016 Energy Standards.

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CHAPTER 2: ATTCP 2016 Update Report Evaluation

Staff identified the changes from 2013 to 2016 for mechanical systems acceptance testing to help facilitate 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 their impact on 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 ATTCPs, ATTs or ATEs.

Substantive Regulatory Changes

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

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 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 ATTCP shall review a random sample of no less than one percent of each technician's completed compliance forms (desk audit), and shall perform randomly selected on-site shadow audits of no less than one percent of each employer's overseen projects, following the assigned technician and observing their performance on the job site (on-site 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 ATTCP

Compliance with the Desk Audit Requirement

In an agreement with ESCO Group, CSPTC 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 one percent of each ATT's completed compliance documents and no less than one percent of each ATT's completed acceptance tests. Each ATT will also be subject to a random audit rate of five percent of its completed mechanical acceptance tests or five compliance documents whichever is greater. CSPTC 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 will be examined, and in most cases, initiate field verification and more frequent audits of the involved personnel. Notifications will be sent to CSPTC 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 ESCO Group will 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

CSPTC has contracted with ESCO Group to provide, independent third party, onsite audit services. ESCO Group will perform onsite audits of no less than one percent of each ATE's calendar year projects. Whenever feasible, onsite audits will be performed across multiple projects at various building-sites and include multiple ATT employed by the ATE. Onsite audits will be performed on or before each ATE's 50th 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. The report shall contain a list of ATEs that 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 utilizing the "job shadow" method conducted by trained and credentialed Quality Assurance Inspectors (QAI).

The 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 ATTCP shall notify the ATE, and the ATT by email of what, if any, remedial actions are required.

The 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 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 annually (and periodically by request) to the Energy Commission of all quality assurance activities with the assistance of ESCO Group.

Staff Assessment

Staff reviewed CSPTC's amended application regarding the proposed quality assurance program.² 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. CSPTC will review 100 percent of each ATT's completed compliance forms electronically and will perform randomly selected on-site audits of no less than one percent of each ATE's overseen projects. Staff determined that CSPTC's proposed quality assurance program complies with the requirements in Section 10-103.2(c)3F of the proposed 2019 Energy Standards.³ A summary of compliance to Section 10-103.2(c)3F is provided in Table 13.

Nonsubstantive Regulatory Changes

Minor Changes to Title 24, Part 6

The updates to the 2016 Energy Standards in Part 6 are considered "minor" because they do not require an ATTCP to substantively alter its approved application. While any changes to the mechanical systems acceptance testing

2 CSPTC Application Amendment. Amendment to the CSPTC ATTCP Application, March 6, 2018, KAM Associates. Docket 13-ATTCP-01 TN#: 222901.

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

requirements, substantive or not, will require an ATTCP to adjust its training curricula, the minor updates do not require substantive training adjustments—such as entirely new laboratory components or lecture. Instead, the minor 2016 updates build upon the requirements in the 2013 Energy Standards. Therefore, the ATTCP must simply demonstrate its training includes the minor 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 ATTCP must demonstrate that its recertification training includes the minor updates. The recertification requirements for minor updates do not include tests or hands-on training, though staff encourages ATTCPs to incorporate those elements where appropriate and possible.

Summary of Compliance Method for ATTCP

CSPTC 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 purpose of the webinar is to familiarize ATTs and ATEs with the 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 Statement, which serves 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 of the test materials for this training are confidential; therefore, staff's evaluation of its compliance is available only in this public document.

Staff Assessment

Staff evaluated CSPTC's submitted recertification materials for the 2016 Energy Standards. Staff has determined that CSPTC'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 CSPTC'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 CSPTC'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 ATTCP Compliance with Minor Title 24, Part 6
2016 Updates**

SECTION	UPDATE	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	TN213523-2 California 2016 Building Energy Efficiency Standards for Nonresidential Buildings – Slides 9-12	☒
120.2(i)	Corrects “greater than or equal to” to “greater than” for consistency with ASHRAE 90.1	TN213523-2 California 2016 Building Energy Efficiency Standards for Nonresidential Buildings – Slide 14	☒
120.2(j)	Adds Section specifying Digital Direct Controls (DDC) applications and qualifications	TN213523-2 California 2016 Building Energy Efficiency Standards for Nonresidential Buildings – Slide 15	☒
120.2(k)	Revises the requirements for space conditioning systems with DDC to the zone level	TN213523-2 California 2016 Building Energy Efficiency Standards for Nonresidential Buildings – Slide 15	☒
140.4(n)	Adds control requirements when interlocks for doors and windows are present	TN213523-2 California 2016 Building Energy Efficiency Standards for Nonresidential Buildings – Slide 16	☒
NA7.5.11.2.4	Removes functional testing for Refrigerant Diagnostic Sensors	TN213523-2 California 2016 Building Energy Efficiency Standards for Nonresidential Buildings – Slides 34-37	☒

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CHAPTER 3:

Staff Recommendations

Pursuant to the Section 10-103.2(f)2 of the 2016 Energy Standards, staff completed its evaluation of the application amendments CSPTC reported in its amended 2016 update report on March 12, 2018. Staff has found that CSPTC's proposed 2016 training curricula adjustments and other application amendments comply with Section 10-103.2(c)3 of the 2016 Energy Standards and the quality assurance requirements of Section 10-103.2(c)3F of the proposed 2019 Energy Standards. Staff recommends that the Energy Commission approve the CSPTC quality assurance plan compliance with the proposed 2019 Energy Standards requirements in place of the 2016 Energy Standards implementation. Staff further recommends that the Energy Commission approve CSPTC's proposed 2016 ATT and ATE training curricula adjustments, 2016 recertification training curriculum, and proposed quality assurance program modifications.

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 controls of a condition or process by a digital device (computer). DDC is often used to control the HVAC devices such as valves via microprocessors using software to perform the control logic.

CSPTC
California State Pipe Trades
Council

A labor union representing plumbers,
pipefitters, and heating, ventilation, air
conditioning, and refrigeration service
technicians.

Energy Standards
Building Energy Efficiency
Standards

State regulations contained in Title 24,
Parts 1 and 6 of the California Code of
Regulations.

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.