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Additional submitted attachment is included below.



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Report Confirming Industry Certification Thresholds Have Been Met for Mechanical Acceptance Test Technician Certification Requirements

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TABLE OF CONTENTS

- I. Introduction
- II. Background
 - a. Purpose of Mechanical Acceptance Test Technician Certification
 - b. General Background of NEMIC Program
 - c. Approval of NEMIC as an Authorized Mechanical Acceptance Test Technician Provider.
- III. Industry Certification Threshold
- IV. NEMIC MATT Certification
 - a. As of 9/23/20, **204** Mechanical Acceptance Test Technicians Have Been Certified to Perform the Acceptance Tests Required by California 2019 Building Energy Efficiency Standard 10-103.2(b)1A
 - b. As of 9/23/20, **54** Mechanical Acceptance Test Technicians Have Been Certified to Perform the Acceptance Tests Required by California 2019 Building Energy Efficiency Standard 10-103.2(b)1B
 - c. Business Locations, Number of Certified NEMIC Technicians on Staff, and Service Area Coverage for Each Employer.
- V. Estimated Labor Costs and End User Costs
- VI. SMART and SMACNA Potential
- VII. AHJ, Plan Reviewer and Design Professional Training
- VIII. Recommendation for Phased Implementation
- IX. Options for other trades
- X. NEMIC Mechanical Acceptance Form Logo Samples
- XI. Conclusion

List of Exhibits

- Exhibit A
 - NEMIC Certified Mechanical Acceptance Test Technicians – Names, ID Numbers, Date Trained & Industry Group
 - NEMIC Certified Mechanical Acceptance Test Employers – Names, ID Numbers & Industry Group

- Exhibit B - Map of Service Area Coverage of NEMIC Certified Mechanical Acceptance Test Employers

- Exhibit C - NEMIC Certified Mechanical Acceptance Test Employers – Service Area Coverage and Number of NEMIC Employees

- Exhibit D - NEMIC Mechanical Acceptance Form Logo Samples

Report Confirming Industry Certification Thresholds Have Been Met for Mechanical Acceptance Test Technician Certification Requirements

I. Introduction

The 2013 California Building Energy Efficiency Standards requires mechanical acceptance tests to be performed by trained and certified Mechanical Acceptance Test Technicians (MATT).

NEMIC was originally approved as a Mechanical Acceptance Technician Training Certified Provider (ATTCP) on June 9th, 2015.

The Commission also enacted an “Industry Certification Threshold” to ensure there was sufficient availability of Mechanical Acceptance Test Technicians prior to making the use of certified technicians mandatory. The Industry Certification Threshold provides that the requirement to use Mechanical Acceptance Test Technicians does not become effective until the Commission determines that at least 300 technicians are certified and a reasonable path for certification is available for industry professionals. The Commission also provided for an optional partial approval process, allowing the threshold to be met (and certification to become mandatory) first for the subset of 8 mechanical acceptance tests set forth in

Section 10-103.2(b)1A of the California 2019 Building Energy Efficiency Standards, and then subsequently all 18 mechanical acceptance tests set forth in Section 10-103.2(b)1A .

As demonstrated by this report, both threshold conditions have been met for all 18 mechanical acceptance tests set forth in California 2019 Building Energy Efficiency Standard 10-103.2(b)1A. Accordingly, the optional partial approval approach is not needed.

NEMIC respectfully requests that the Commission issue its determination that the Industry Certification Threshold has been met to require certified Mechanical Acceptance Test Technicians for all 18 mechanical acceptance tests.

II. Background

a. Purpose of Mechanical Acceptance Test Technician Certification Requirement.

Mechanical systems account for 35-40%¹ of commercial building electrical load. Given the large share of California energy usage devoted to mechanical systems, the proper operation of mechanical systems provides the biggest opportunities to reduce electricity use and limit production of greenhouse gases related to global climate change. However, these reductions are only possible if mechanical systems are installed correctly so they can achieve their specified optimum energy saving potential.

The 2010 Code required acceptance testing of mechanical systems in order to ensure that these systems have been installed correctly and perform efficiently. The 2010 Code, however, did not require technicians to have any qualifications, expertise or demonstrated competence in performing these tests and verifying that the systems have been installed and perform as designed.

At a February 27, 2012 CEC workshop on the certification proposal, numerous stakeholders testified that there was no quality control over acceptance tests and that the vast majority of acceptance testing are being performed by persons without sufficient experience, knowledge, training or competence to correctly perform these tests. Furthermore, California Commissioning Collaborative research on acceptance testing enforcement and effectiveness found that code officials, contractors and engineers were not clear on the acceptance testing procedures and form documentation. As a result, incomplete or incorrectly executed acceptance tests and forms are currently the norm rather than the exception. Testimony was provided that training and certification of acceptance test technicians were needed to make the acceptance test requirements meaningful, reliable and cost-effective.

¹ Frequently Asked Questions (FAQs) - U.S. Energy Information Administration (EIA). (n.d.). Retrieved August 03, 2020, from <https://www.eia.gov/tools/faqs/faq.php?id=86>

The Commission addressed this issue by including Acceptance Test Technician Certification requirements in the 2013 Code. Using Acceptance Test Technicians that have met specific experience, training and certification requirements to perform acceptance testing will significantly reduce the incidence of mechanical systems being poorly installed and operating below their specified efficiency. Mechanical systems require a unique mix of experience, training and competence to ensure proper performance. Improper installation and inadequate acceptance testing results in sub-standard performance, a high rate of call-backs, and the disabling of energy saving components by frustrated consumers. Studies have shown that errors in the installation of HVAC systems are common and can result in a 20% to 30% increase in energy use.² Requiring the use of trained and certified Mechanical Acceptance Test Technicians is consistent with the Commission's goal to achieve maximum energy efficiency and will ensure that actual energy savings and performance are consistent with design and specification standards.

b. General Background of NEMIC Program

- The original application was approved at the March 11, 2015 business meeting of the California Energy Commission.
- The 2019 NEMIC Amended Application for Nonresidential Mechanical Acceptance Test Technician Certification Provider was submitted for approval with the following proposed amendments:
 - NEMIC ATTCP Certification Manual
 - Mechanical Acceptance Test Employer Training Materials
 - Mechanical Acceptance Test Employer Certification Exam
 - Mechanical Acceptance Test Technician Training Materials
 - Mechanical Acceptance Test Technician Certification Exam
- NEMIC Mechanical Acceptance Test Technician Certification Provider Application was approved by the CEC on June 10, 2020

c. Approval of NEMIC as an Acceptance Test Technician Certification Provider.

NEMIC has been approved as a Mechanical Acceptance Test Technician Provider by the Executive Director, consistent with the regulations adopted by the Commission. Pursuant to this authorization, NEMIC has now trained and certified 258 Acceptance Test Technicians. (See Exhibit A)

² California Energy Commission, Strategic Plan to Reduce the Energy Impact of Air Conditioners (June 2008), CEC-400-2008-010, at p. (v) (<http://www.energy.ca.gov/2008publications/CEC-400-2008-010/CEC-400-2008-010.PDF>); see also Zabin, et. al, Workforce Issues and Energy Efficiency Programs: A Plan for California's Utilities, Don Vial Center for Employment in the Green Economy (2014), at pp. 32-34 and Appendix 2B (<http://laborcenter.berkeley.edu/workforce-issues-and-energy-efficiency-programs-a-plan-for-californias-utilities/>)

III. Industry Certification Threshold

Title 24, Part 1, section 10-103.2, subsection (b) states that Mechanical Acceptance Test Technician and Employer certification requirements shall take effect when the Energy Commission finds that each of the following conditions are met:

- a. There shall be no less than 300 ATTs certified to perform the complete set of mechanical acceptance tests in Building Energy Efficiency Standards, Section 120.5, except as provided in Subsection 10-103.2(b)1.B. The number of certified ATTs shall be submitted to the Energy Commission in the annual reports prepared by ATTCPs, as specified in Section 10-103.2(d)1.

- NA7.5.1 Outdoor Air Ventilation Systems
- NA7.5.2 Constant Volume, Single Zone Unitary Air Conditioners and Heat Pumps
- NA7.5.3 Specified Duct Systems
- NA7.5.4 Air Economizer Controls
- NA7.5.5 Demand Control Ventilation Systems
- NA 7.5.6 Supply Fan Variable Flow Controls
- NA7.5.7, NA7.5.9 Hydronic System Variable Flow Controls
- NA7.5.8 Boiler or chiller isolation controls
- NA7.5.9 Hydronic systems with supply water temperature reset controls
- NA7.5.10 Automatic Demand Shed Control
- NA7.5.11 Fault Detection and Diagnostics (FDD) for Packaged Direct-Expansion Units
- NA7.5.12 Automatic Fault Detection and Diagnostics (FDD) for air-handling units and zone terminal units
- NA7.5.13 Distributed Energy Storage DX AC Systems
- NA7.5.14 Thermal Energy Storage (TES) Systems
- NA7.5.15 Supply air temperature reset controls
- NA7.5.16 Water-cooled chiller condenser water reset controls
- NA7.5.17 Occupant Sensing Zone Controls

- b. If there are less than 300 ATTs certified to perform all 18 mechanical acceptance tests in Building Energy Efficiency Standards, Section 120.5, then there shall be at least 300 ATTs certified to complete the following 8 tests:

- NA7.5.1 Outdoor Air Ventilation Systems
- NA7.5.2 Constant Volume, Single Zone Unitary Air Conditioners and Heat Pumps
- NA7.5.4 Air Economizer Controls
- NA7.5.5 Demand Control Ventilation Systems
- NA 7.5.6 Supply Fan Variable Flow Controls
- NA7.5.7, NA7.5.9 Hydronic System Variable Flow Controls

• NA7.5.10 Automatic Demand Shed Control

- c. Industry Coverage by ATTCPs. ATTCPs approved by the Energy Commission, in their entirety, provide reasonable access to certification to the following industry groups: Professional engineers, licensed architects, HVAC installers, mechanical contractors, Testing and Balancing (TAB) certified technicians, controls installation and startup contractors and certified commissioning professionals who have verifiable training, experience and expertise in HVAC systems. The Energy Commission will determine reasonable access by considering factors such as certification costs commensurate with the complexity of the training being provided, certification marketing materials, prequalification criteria, class availability and curriculum.

- IV. More than 300 mechanical acceptance test technicians have been certified to perform the acceptance tests required by Section 10-103.2(b)1A.

As of September 2nd, NEMIC has certified 258 Mechanical Acceptance Test Technicians (See Exhibit A and B) to perform the acceptance tests. Each of these technicians has met the minimum pre-qualification requirements, completed the classroom and hands-on training requirements and passed the certification exam. In addition to NEMIC, the CEC has approved three other Mechanical ATTCPs: (1) the [California State Pipe Trades Council \(CSPTC\)](#); (2) the [National Environmental Balancing Bureau \(NEBB\)](#); and (3) the [Refrigeration Service Engineers Society \(RSES\)](#). Combined, the four approved Mechanical ATTCPs have certified over 300 total technicians to perform all 18 acceptance tests set forth in Section 10-103.2(b)1A. In addition, numerous other technicians have been certified to perform the subset of 8 acceptance tests set forth in Section 10-103.2(b)1A, ensuring that well over 300 technicians will be available to perform the most common 8 acceptance tests.

Each NEMIC certified technician has met the minimum pre-qualification requirements, completed the classroom and hands-on training requirements and passed the certification exam as required by California Code of Regulations, title 24, Part 1, § 10-103.2 and set forth in the NEMIC Application. The criteria used to confirm eligibility and credentials was provided in the updated NEMIC Mechanical Acceptance Test Technician Certification Provider Application as approved by the CEC on March 11, 2015 and has been followed for each of these certified NEMIC technicians.

Attached, as Exhibit C, is a list of the names and certification identification numbers of each of the 43 businesses with employees currently certified as Mechanical Acceptance Test Technician Employers, their service areas, and the number of NEMIC certified technicians in their employ.

Exhibit C does not identify specific names of certified NEMIC certified technicians and the contractor they are currently employed by. It is important to understand that the NEMIC certification is a certification of the individual. The individual maintains their certification as they change locations or employers. The SMART workforce is fluid and has the ability to quickly meet the needs of the market. Technicians can easily leave one SMACNA contractor or region to meet the needs of another SMACNA contractor or region. For this reason, some SMART members are MATT certified whom not currently residing within the state of California. Out of state certifications are expected to rise once a MATT mandate increases market opportunities. The aforementioned labor system allows for SMART members from throughout the country, and Canada, to quickly respond to market demand as it arises. As a result, a list of specific technicians working for specific firms is not static and would therefore be inaccurate. However, the NEMIC database (MechCheck) will accurately track all MATT acceptance forms and the employer they performed the forms for. This tracking system will be accurate once a MATT is mandated, and all required mechanical acceptance forms are completed on the database.

Attached, as Exhibit B, is a map showing that the combined service area of the NEMIC certified employers covers every single county in California. While the Industry Certification Threshold regulations do not expressly require a showing that Certified Mechanical Acceptance Test Technicians are available in every California county, NEMIC is pleased to confirm that such coverage currently exists.

V. Estimated Labor Costs and End User Costs

The following cost ranges are estimations and will alter depending on region, crew components, equipment being verified, and site-specific requirements.

- a. Estimated Labor Costs – Estimated Labor Cost represents the hourly taxable wage range. The Estimated Labor Cost does not include benefits such as family health insurance, education, pension, and supplemental retirement savings.
- i. San Diego Region \$20 - \$41 per hour
 - ii. Los Angeles Region \$19 - \$49 per hour
 - iii. Bakersfield Region \$16 - \$37 per hour
 - iv. Central Coast Region \$21 - \$47 per hour
 - v. Bay Area Region \$27 - \$65 per hour
 - vi. Central California Region \$18 - \$47 per hour

- b. Estimated End User Costs – Estimated End User Costs represent the hourly cost charged the customer having MATT services performed.
 - i. Rate is between \$31 and \$128 depending on location, crew components, economy of scale, equipment, and site-specific requirements.

VI. SMART and SMACNA Potential

Training for the NEMIC MATT certifications takes place at 11 training centers located throughout California and operated jointly by the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) and the International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART). The 11 SMART and SMACNA training centers have recently updated their apprentice training programs and beginning next year expect to train at least 250 apprentices as additional Mechanical Acceptance Testing Technicians per year. As discussed in Section VIII, NEMIC supports a recent staff suggestion to phase in the requirement to use certified MATTs geographically over an 18-month period. With the new apprentice training program, NEMC expects that its program alone will have between 800 and 1000 available acceptance testers by the time this requirement becomes effective statewide.

This is a conservative estimate. At the time of this report, there are approximately 2292 SMART HVAC apprentices in California that will eligible to become certified Mechanical Acceptance Test Technicians over the next three years and approximately 7424 SMART HVAC journeypersons in California that are eligible to become certified Mechanical Acceptance upon passing the Qualification Examination.

While SMART and SMACNA training centers have the capability to ramp up training for all eligible apprentices and journeypersons, the trigger for an increase in training is driven by industry demand. Upon the Commission making the use of certified Mechanical Acceptance Test Technicians mandatory, SMART and SMACNA can justify offering training to all eligible journeypersons and mandating training for all apprentices.

VII. AHJ, Plan Reviewer and Design Professional Training

NEMIC has developed an online training course for the Authority Having Jurisdiction (AHJ), inspectors, and design professionals. With a total duration of approximately four hours, the online course contains three academic modules and nine labs. Attendees must pass a quiz after each module/lab before moving onto the next module/lab.

Academic modules will cover the Mechanical Acceptance Testing, ATTCP program, and how they can use the program to their benefit. Inspectors and design professionals will also learn how they can file a complaint, and the complaint procedure, regarding faulty or misleading acceptance tests.

The labs are filmed in a NEMIC verified training facility. Experienced field technicians discuss and demonstrate the Construction and Functional acceptance tests. Attendees will experience the physical inspection process, as done on active construction projects. Upon completion, attendees will receive a Certificate of Attendance that can be used towards any continuing education requirements.

Upon relaxation of pandemic social distancing safety procedures, the same course will be offered live at training centers within City of Industry, Sacramento, Fairfield, San Jose, Ventura, and San Leandro training facilities. Following an initial round of trainings, we will begin offering the training at all of our California training center locations.

Both the online course and onsite training will be offered to qualifying the inspectors, AHJ, and design professionals at no charge.

VIII. Recommendation for Phased Implementation

Commission staff have recently recommended phasing in the requirement to use certified MATTs geographically over an 18-month period. While there are currently a sufficient number of certified MATTs to cover the entire state, NEMIC supports the proposed geographic phasing proposal in order to ensure a smooth rollout of these requirements. Commission staff has tentatively proposed the following rollout schedule:

- a. Phase one will be implemented six months after CEC approval of the implementation plan and will be limited to the AHJs within Los Angeles County
- b. Phase two will be implemented three months after phase one (9 months from Business Meeting decision) and will expand the mandate to include the rest of Southern California.
- c. Phase three will be implemented three months after phase two and will expand to include the Bay Area.
- d. Phase four will be implemented three months after phase three and will expand to include the Central Valley area.
- e. Phase five will be implemented three month later and will expand to include Northern California, a total of 18 months after the Business Meeting instituting the mandate.
- f. Phase six begins immediately after phase five and consists of on-going implementation efforts such as offering training classes to any AHJs or builders

IX. Reasonable Access to Certification Is Available to a Majority of the Listed Industry Groups

Per Section 10.103.2(b)2, ATTCPs approved by the Energy Commission, in their entirety, must provide reasonable access to certification to the following industry groups: Professional engineers, licensed architects, HVAC installers, mechanical contractors, Testing and Balancing (TAB) certified technicians, controls installation and startup contractors and certified commissioning professionals who have verifiable training, experience and expertise in HVAC systems. The Energy Commission will determine reasonable access by considering factors such as certification costs commensurate with the complexity of the training being provided, certification marketing materials, prequalification criteria, class availability and curriculum.

NEMIC provides Mechanical Acceptance Test Technician training and certification to all employees of SMART-signatory contractors. Employees of these contractors include professional engineers, licensed architects, HVAC installers, mechanical contractors, Testing and Balancing (TAB) certified technicians, controls installation and startup contractors and certified commissioning professionals. Accordingly, NEMIC's training alone covers all industry groups listed in Section 10.103.2(b)2. The International Certification Board charges \$125 for new certifications and \$125 for renewals. Fees are waived for SMART members. NEMIC provides Mechanical Acceptance Test Technician training at no cost.

The other Acceptance Test Technician Certification Providers (CSPTC, NEMIC, NEBB, and RSES) also, as a whole, provide reasonable access to certification to all professional engineers, licensed architects, HVAC installers, mechanical contractors, Testing, Adjusting and Balancing (TAB) certified technicians, controls installation and startup contractors and certified commissioning professionals who have verifiable training, experience and expertise in HVAC systems. Accordingly, the requirement to provide reasonable access to specified industry stakeholders has been met.

- X. NEMIC Mechanical Acceptance Form Logo Samples
- a. NEMIC Logo (Background Watermark on NEMIC Acceptance Forms)



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b. ICB/TABB Logo (Lower Right-Hand Corner on NEMIC Acceptance Forms)



XI. Conclusion

As demonstrated by this report, and in combination with the other certified Mechanical Acceptance Test Training Certification Providers both threshold conditions have been met for the subset of acceptance tests set forth in California 2019 Building Energy Efficiency Standard 10-103.2(b)1A.

Accordingly, NEMIC respectfully requests that the Commission issue its determination that the Industry Certification Threshold has been met for certified Mechanical Acceptance Test Technicians.